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THE WORLD BANK

Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

(Credit 144-DA)

April 3, 1978

Operations Evaluation Department

Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

(Credit 144-DA)

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Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

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PREFACE

This report presents the results of an audit of the Hinvi Agricultural Project in Benin for which the World Bank granted an initial credit of US$4.6 million (Credit 144-DA), signed in March 1969, and a supplemental credit of US$600,000 (Credit 144-2-DA), signed in March 1974. Credit 144-DA was fully disbursed in June 1976, a few days before the closing date, and undisbursed funds of Credit 144-2-DA (US$25,000) are fully committed.

The report consists of a project completion report (PCR), prepared by the Western Africa Regional Office in March 1977, and a memorandum prepared by the Operations Evaluation Department (OED). The memorandum contains a summary of the PCR and comments on certain conclusions of the PCR that warrant more detailed analysis.

The audit was based on the PCR, a review of the files available in the Bank, discussions with Bank staff familiar with the project and an OED mission to Benin in August 1977.

The points discussed in the memorandum have been selected not only because of their importance in this project, but also because they appear to be relevant to the performance of three other projects in West Africa evaluated recently by OED, viz. Senegal, Casamance Rice Project; Cameroon, Semry Rice Project; and Sierra Leone, Integrated Agricultural Development Project. The reports on these projects are in preparation.

The writers of the report wish to express their thanks to the Government of Benin and to the Societe Nationale de Developpement Rural (SONADER, now SOBEPALH), which was responsible for execution of the project, for their cooperation.

BASIC DATA SHEET

BENIN - HINVI AGRICULTURAL PROJECT Credit 144-DA

A. Amounts

	Original	Disbursed	As of June 30, 1977 Repaid	Outstanding
Credit 144-DA	4.6	4.6	-	4.6
Credit 144-2DA	0.6	0.575	-	0.575
Total	5.2	5.175	-	5.175

B. Project Data

	Original Data	Revisions		Actual
First Mention in Bank Files				2/15/65
Appraisal Mission				1/15/67
Board Approval				2/18/69
Credit Agreement			3/22/74	3/ 5/69
Credit Effectiveness	6/ 5/69		6/20/74	8/ 5/69
Physical Completion	6/30/77			12/31/75
Credit Closing	6/30/76			6/11/76
Total Costs	9.6	10.6/1	9.59/1	9.1
Economic Rate of Return	12%		Re-estimated	5%

C. Mission Data

	Month, Year	No. of days	No. of persons	No. of Manweeks	Date of Report
Prepreparation					4/65
Preparation	11-12/66				6/ 1/67
Pre-appraisal	3/67	6	4	3	
Appraisal	7/67	28	3	12	/2
Reappraisal	8/68	12	2	4	2/ 3/69
Supervision I	4/69		1	1	6/26/69
Supervision II	8/69	10	3	5	Missing
Supervision III	3/70	11	3	5	5/18/70
Supervision IV	8/70	14	1	2	9/30/70
Supervision V	2/71	10	2	3	4/20/71
Supervision VI	6/71	12	3	6	6/28/71
Supervision VII	1/72	11	1	2	4/ 7/72
Supervision VIII	10/72	11	2	4	11/21/72
Supervision IX	6/73	3	1	1	6/27/73
Supervision X	9/73	5	2	2	11/28/73
Supervision XI	5/76	7	1	1	6/ 5/74
Supervision XII	2/75	11	2	3	2/27/75
Total				35	

No follow-up project.

D. Exchange Rates

US$1 = CFAF 247 (1969)
277 (August 1969)
256 (April 1972)
215 (November 1973)

/1 Estimates.

/2 Report issued after reappraisal.

Project Performance Audit Report

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HIGHLIGHTS

The audit reviews progress under the Agricultural Project, which provided funds for the establishment of 6,000-ha oil palm plantations, a 6,000-ha expansion of the annual food crop area, and the planting of 1,000-ha of timber, as well as the construction of an oil mill and project infrastructure. The main objective of the project was to develop an efficient and modern system of agricultural production to assure participating small farmers improved incomes.

The project's accomplishments fell short of appraisal expectations. Poor rainfall in two consecutive years caused delays in oil palm development and production, as well as the initial failure of the annual crop development, although during project execution it became apparent that labor constraints were a major factor causing the disappointing performance of the food crop subcomponent. To overcome this difficulty, an accelerated promotion of draft animal mechanization was required, for which the project had only insufficient funds available. The project was successful in assisting SONADER the executing agency to continue its good performance and in supporting cooperative developments. The rate of return has been re-estimated at 5% as compared to 12% at appraisal.

The following points may be of special interest:

- investments in oil palm development despite known climatic constraints (PCR paras. 1.02, 1.04, 4.02-4.05, 4.34, 5.02, 5.08);

- shortfall of food crop production due to unexpected labor constraints (PPAR paras. 32-36; PCR paras. 1.03, 1.06, 2.18, 3.01, 4.15, 5.02);

- introduction of draft animal mechanization helps break labor bottlenecks (PPAR paras. 18, 37, 38; PCR paras. 4.16-4.19, 5.02);

- negative influences of Government pricing policies (PPAR paras. 42-44; PCR paras. 4.11, 4.15, 4.21, 4.36, 6.02);

- successful operations of cooperatives and the wholly national project agency (PPAR paras. 24-31; PCR paras. 1.05, 2.10, 2.14, 4.29, 4.31, 4.32).

Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

(Credit 144-DA)

I. PROJECT SUMMARY 1/

Background

1. The possibility of Bank involvement in oil palm development in Benin was raised by an FAO/IBRD CP mission in April 1965. European financial aid agencies were also interested but reluctant to carry the full burden of external financing. In 1966 the Bank helped the Societe Nationale de Developpement Rural (SONADER), 2/ a parastatal run completely by Africans, to prepare the proposal. Three Bank missions in 1967 and 1968 reviewed the project and the Credit Agreement became effective in August 1969.

2. The constraints on the agricultural components of the project, located in the Grand Hinvi area about 70 km north of Cotonou, were recognized from the start:

(i) marginal climatic conditions for the proposed ten 600-ha oil palm blocks, making it likely that yields would be 50% below those in the most favorable regions of West Africa, and

(ii) low yields also likely on individual plots in the proposed ten 600-ha annual crop blocks and competition between cultivation activities on these plots and maintenance of the cooperative plantations.

In spite of these drawbacks, the pre-appraisal report concluded that the project was justified because there were no investment opportunities then offering better prospects in the agriculture sector of the country.

1/ Adapted from the PCR.
2/ SONADER is now called SOBEPALH but its functions have not undergone any significant change.

3. The appraisal report did not differ substantially from the pre-appraisal report. It described SONADER as having a high level of competence and possessing considerable experience in the organization of cooperatives. It repeated the misgivings regarding the area's suitability for oil palm. But it gave less weight to the constraints on annual crop production; in fact income from these crops was a significant element in the total incremental income forecast in the report and contributed appreciably to the project's favorable rate of economic return (12%).

The Project

4. The project consisted mainly of: (i) planting and bringing to maturity 6,000 ha of oil palms; (ii) preparing 6,000 ha for annual crop production; and (iii) constructing an oil mill with an ultimate annual capacity of 70,000 tons of ffb.[1/] The project also comprised components for forestry, livestock, maize storage, roads and administrative facilities.

5. The participants were to be organized into ten producer cooperatives - each with 600 ha of oil palm and 600 ha of annual crops (the latter block sub-divided in 1.5 ha individual plots). For the first 25 years SONADER was to promote and direct the activities of the cooperatives. Subsequently, the cooperatives were to become lessees of the land and owners of the improvements brought by the project.

6. The main objective was to develop an efficient system of agricultural production capable of replacing the "shifting cultivation" system and raising the farmers' living standards. The project was to make it possible for Benin to maintain, or even increase, its palm oil exports. The annual value of the incremental production was estimated at US$1.3 million in 1975 and US$2.4 million in 1980 (1969 prices).

7. The cost of the project was estimated at US$9.6 million (or CFAF 2.37 billion), of which IDA was to finance 47.9% (i.e. US$4.6 million), FAC (Fonds d'Aide a la Cooperation, the French bilateral aid fund) 47.9% and the Benin Government 4.2%.

8. The physical implementation of the project was to be executed directly by SONADER. For the 25-year life of the project, SONADER was to manage on behalf of the cooperatives the oil palm plantations, the annual crop blocks and all the productive components of the project except for the oil mill, which would be SONADER property. SONADER was thus to play two distinct roles: (i) that of a development agency, and (ii) that of a managing agent for the cooperatives.

9. Farmer participation in the project was not entirely voluntary, since SONADER was legally empowered to oblige landowners in the project areas to join producer cooperatives and rent their land to these cooperatives.

1/ fresh fruit bunches.

The farmers could become members of the cooperatives by leasing their land to them ("A" share members), by working on the oil palm plantations ("B" share members), or both. The novel feature of this cooperative system was the formation of producer cooperatives with two categories of members, where it was intended that only the "B" share members were entitled to a voice in the running of the cooperative. In the event of a surplus, they were to receive interest of 3% on their shares in the profits of the cooperative.

Implementation

10. Oil Palm Plantations. The planting program got off to a good start and was completed in accordance with the forecasts. Altogether 6,075 ha of oil palms were correctly planted and reasonably well maintained, despite difficulties in obtaining the labor needed for these operations.

11. Annual Crop Areas. The annual crop program soon ran into difficulties. Fewer farmers than expected were prepared to abandon traditional shifting cultivation on plots cleared in the forest and take up 1.5 ha holdings in the project blocks. On these 600 ha blocks, called ZOCA's, input use was minimal and yields far below appraised targets. By 1971, only 450 farmers had taken up plots in the ZOCAs. In 1971-72, a greater flexibility permitted to the farmers by SONADER for choosing the crop rotation, and the introduction of animal traction, stimulated more farmer interest. Thanks to technical assistance financed by FAC, the use of animal traction increased rapidly. But constraints on the supply of animals are believed to limit expansion of ox-drawn cultivation and further development of the ZOCAs remains uncertain.

12. Oil Mill. The original project called for a mill of 24 t/h capacity to be built in two stages. The revised project (April 1971) showed the need for a 20 t/h mill, with provision for expansion to 40 t/h. Construction of the mill was completed in 1974 as planned, but it did not go into operation until mid-1975 owing to water-supply problems. The total investment cost was CFAF 962.4 million (US$3.9 million), as estimated in 1971. The functioning of the mill is satisfactory on the whole, especially since some last adjustments in 1977 which made it possible to raise capacity to 27 t/h.

13. Costs and Financing. The project costs and financing schedule was revised twice. In 1971, with the difficulties encountered on the ZOCAs and a need to reallocate oil palm production among existing and planned mills, project costs were restructured. The Bank then abandoned its support to the ZOCAs, which SONADER pursued thereafter with FAC technical assistance, and the funds thus released helped finance the extra costs of the mill. Total project costs were increased by 26% to CFAF 3.02 billion.

14. In 1973 SONADER faced a financial crisis, caused by successive dollar devaluations and non-payment of the government contribution, and aggravated by the agency's failure to establish financial planning and control systems. To solve these problems, IDA provided a supplemental credit of US$600,000 in January 1974 and FAC contributed an additional US$520,000 to the project.

15. In the end, total project expenditures were lower than estimated (CFAF 2,266.6 million). IDA financing was increased, however, from US$4.6 million to US$5.2 million, thus accounting for just over 54% of the total bill. FAC's contribution amounted to 43% and the Government's to 3%.

16. These costs were determined from the disbursement records kept by SONADER. For certain types of expenditures, the weakness of SONADER's accounting procedures means that actual costs cannot be stated with certainty. However, the accounting system is now being improved. It must be recognized that disbursements and procurement were particularly complicated in this project owing to the sharing of payments between FAC and the Bank.

Impact of Project

17. Plantation Yield and Production. Despite the excellent performance in planting, and satisfactory maintenance, production has been very much below estimates. The principal reason is low rainfall. In most of the cooperatives, rainfall for two years (1971-72 and 1972-73) was less than the minima recorded over the previous 30-year period and distributed very unevenly over neighboring cooperatives. Production was also affected by fires, spreading from where farmers were burning their fields, and theft, due to the inadequate organization of ffb collection and the higher prices obtainable on the parallel market.

18. Annual Crops. With the introduction of animal traction, the total number of farmers in the ZOCAs rose from approximately 1,800 in 1973 to 3,000 in 1975, and those using ox-drawn equipment from 352 to 880. Maize yields are double those obtained with hand cultivation; cotton yields, however, remain marginal.

19. Oil Mill. The functioning of the mill is satisfactory, although a certain number of difficulties still persist (peak production higher and more concentrated than anticipated, high proportion of kernel, insufficient oil storage capacity). The free fat acid content is much too high (over 7% as against a target of 4%), due to inadequate organization of fruit collection and the insufficiency of storage capacity. SONADER plans to raise the capacity from 27 t/h to 40 t/h, which will entail an additional cost of CFAF 900 million (US$4 million at 1976 prices).

20. SONADER. The assistance from the Bank and FAC helped SONADER pass through its financial crisis in 1973. Essentially this assistance provided for the injection of more funds and for an administrative reorganization designed to bring about tighter control of the plantation operations and more effective guidance for the cooperatives.

21. Cooperatives. The cooperatives had a hard time getting going, mainly because of initial opposition from the landowners. The working members did not perceive themselves as owners of the oil-palm plantations, responsible for their success or failure, and they considered remuneration from the plantations as being too low in relation to work done. At the recoverable price of CFAF 5/kg ffb 1/ the estimated cash flows of the cooperatives are not satisfactory. In these circumstances, the cooperatives would never be able to pay their debts as provided for in the Credit Agreement. The Government has been asked several times to raise the price, but no decision has yet been taken.

22. Rate of Return. To recalculate the economic rate of return, the wage is set by the PCR to reflect the labor constraints in the area, no deduction was made for the oil and kernel production foregone from wild palms on project land, and annual crop production was expected to stabilize at the 1975 level on the 1,500 ha presently cropped. Under various assumptions of future oil palm yields, the economic rate of return is estimated at less than 5%.

Concluding Remarks

23. The project has been closely supervised since its beginning and IDA demonstrated its flexibility in 1971 and 1973 in coping with the problems encountered. However, the outcome of the project now depends on two emerging problems concerning organization and the financing of the cooperatives. The first was precipitated by Government's decision to entrust all extension work in the country to a newly formed organization; SONADER would henceforth only manage fruit collection and processing. If carried out it would mean abandoning the concept of integration of the different project functions in one single organization and SONADER's supervision of the cooperatives. The second problem results from the small share (37% of net revenue) of the income of the oil-palm plantations received by the cooperatives. The low share jeopardizes their autonomy. Government appears to be aware of the probable consequences of these matters.

1/ This price has been raised since the time of the PCR (para. 44).

II. MAIN ISSUES

Institutional Aspects

24. SONADER. One of the unusual features of the project is that it was prepared and executed by a Beninese corporation with very little technical assistance. SONADER assembled the technical, social, and economic data, and prepared the whole of the Government's application. The agency's management has been sound, both for this project and for activities in other regions covering similarly ambitious programs. Besides incorporating into its operations a number of new activities called for at appraisal, such as stock-raising, forestry plantations, and palm oil processing, SONADER succeeded also in introducing animal traction to improve the situation in the ZOCAs, a component not discussed in the planning period. SONADER also innovated by establishing a women's section in the field service, partly to ensure support from female workers (para. 42). Such weaknesses that drew the attention of supervision, particularly in accounting, were or are being corrected and no longer seem to seriously affect agency operations. To sum up, despite its deficiencies, SONADER is remarkably effective, and this is recognized not only by the Government but also by the commercial banks.

25. The chief reasons for this success are: (i) SONADER has always been able, because of its good reputation, because of a salary structure which remunerates its officers for their good performance, and because of its favorable southern locations (not far from the major urban centers), to attract competent staff and thus to set up an efficient management team; (ii) SONADER has operating autonomy and executes its development programs according to business criteria; (iii) however, this autonomy does not make SONADER into a "foreign body", since it remains first and foremost an executing agency for Government policy, well integrated into the national institutional setting; and (iv) SONADER was able to effectively coordinate its different fields of activity, because they were integrated under a single authority.

26. SONADER's ability to analyze its problems and act accordingly is impressive. The introduction of ox-drawn cultivation and the creation of a female worker's section exemplify this ability. It is noteworthy that SONADER has responded to its experience without having instituted a formal monitoring and evaluation function. SONADER delegates authority to its different sections and the cooperatives. 1/

1/ As the PCR points out, this efficient network for communication and coordination may be lost if the new agencies established recently (CARDER: Centre d'Appui Regional pour le Developpement Rural; SONACEB: Societe Nationale du Commerce Exterieur du Benin; SODERA: Societe de Developpement des Ressources Animales) start performing the functions officially assigned to them. Government confirmed to the audit mission that it is aware of the dangers of subdividing SONADER's activities among the new entities.

27. SONADER's experience raises the question as to whether the Bank in its projects should limit the services of expatriates to advisory functions during the initial stages of execution and institution building and have projects managed by national staff from the onset. On the one hand, the project had characteristics which are usually thought of as requiring expatriate management, numerous components involving a complex task of coordination, and components such as the establishment of estate plantations and the operation of major processing facilities, calling for strict administrative discipline. SONADER has demonstrated that even these difficult tasks are within reach of local agencies. Furthermore, local management seems to facilitate both the integration of the project into national programs and the interaction between the project and the intended beneficiaries. These are important advantages over expatriate management for maintaining project achievements once external financial assistance ceases. On the other hand, Benin is known to be exceptionally well endowed with high-caliber personnel. Furthermore, SONADER had accumulated ten years of experience when the project started and was well established as a trustworthy undertaking to which the government was willing to delegate authority to operate efficiently. It is therefore difficult to determine to what extent SONADER's experience is replicable. Even in Benin SONADER's success seems to be exceptional: OED is currently auditing the Benin Zou-Borgou Cotton Project and the performance of the semi-autonomous executing agency for that project (SONACO) has been pretty poor.

28. The Cooperatives. In contrast to experience in most African countries, and despite valid reservations made in the PCR (PCR paras. 4.33 through 4.36), project cooperatives seem to be well on the way to becoming efficient farmers organizations, managed to a large degree by the members themselves. This phenomenon can be attributed to the following set of factors:

(a) Legislation, which attempts to find original solutions for local conditions. By making a distinction between "A" and "B" members (PCR para. 2.16) for example, this legislation facilitated low-cost land reform by compensating land owners with shares instead of cash while leaving management authority to the workers (only "B" members hav voting rights);

(b) Good management support from SONADER, which gives the cooperatives efficient back-up in selecting staff, provides technical assistance and supplies inputs. SONADER management now views its role as a supporting institution to the cooperatives, the reverse of the earlier relationships;

(c) A fair system of remuneration (wages, dividends) which increases payment to farmers as the cooperative develops, thereby starting to satisfy the cooperative member's expectation of increased income in step with project progress;

(d) An efficient system of supervision. The accounts are kept by SONADER, but are subject to a dual-control system, being supervised by (i) an auditor chosen by the cooperative members, usually a trusted civil servant and (ii) a Government auditor from the Ministry of Rural Development;

(e) The granting of effective powers, from the start, to the Board of Directors, which organizes the cooperative's day-to-day operations and pays and supervises the permanent staff of the cooperative; and

(f) A national political context favoring farmer participation in agricultural development organizations.

29. One potential obstacle to the smooth development of the cooperatives has not been mentioned in the PCR;1/ it is the risk of a small minority of "B" share members gaining control of the cooperatives' management, at the expense of those who actually contribute most of the work. In one of the cooperatives visited by the audit mission, there were 470 "A" members, 100 "B" members and 300 workers who had not accumulated in four years the 200 days necessary to become "B" members. In another cooperative the composition of the labor force in 1976 was as follows:

4% worked over 200 days per year (semi-permanent workers);
17% worked between 50 and 200 days per year;
37% worked between 10 and 49 days per year;
42% worked less than 10 days per year.

Thus, less than a quarter of the manpower reaches the average 50 mandays per year necessary to acquire a "B" share within four years time. For the 10 cooperatives there are 4,731 "A" members and 1,218 "B" members. These figures compare with the estimate of 3,000 farmers having a plot in the ZOCAs (PCR para. 4.18). There is no indication how that group of 3,000 relates to the "A" and "B" categories, but at most only about 40% of farmers in the ZOCAs have "B" status. Since only "B" members are legally entitled to participate in the management of the cooperatives, this minority group could in theory work against the interests of the broadly based participation on which the principle of the cooperatives was based.

30. So far, the workers who are not "B" members are nevertheless permitted to participate in share holder meetings. They also received dividends in proportion to their work. Thus, the danger of a take-over by the minority "B" members does not seem to be immediate. Nevertheless, the legislation should be amended to take the actual situation into account and allow formal participation of all male and female workers (e.g., through the creation of special shares for instance).

1/ Two other problems mentioned in the PCR are the planned take-over of the cooperatives by a newly formed Government agency and the low price paid by Government for the cooperatives oil palm products.

31. In sum, project success is related to the strength of its institutions. At the outset the Bank decided to take part in the project chiefly on the basis of the proper functioning of SONADER. As indicated in the PCR (para. 1.05) the initial confidence was justified. Today, the fact that SONADER and the cooperatives are functioning satisfactorily augurs well for the future of the project. In three other West African projects visited at the same time as this audit (see the Preface), second phase projects were necessary not only to support additional investments, but also to maintain the achievements of the first phase by providing further management assistance to the project executing agency. This is not so in the Hinvi Project. The fact that it has been executed by a sound agency with an entirely local staff makes it possible to consider proposals of further financing to carry out additional investment programs.

Insufficient Knowledge of Local Conditions

32. Labor. For the plantations, the Bank assumed that family workers in the traditional system were largely underemployed and had limited opportunities for employment outside the project. Thus, the initial scheme envisaged that the cooperatives would benefit from a steady labor force with each member working 50 to 100 days per year once the project was fully under way. This regular supply of labor was expected to be an important factor in ensuring the proper technical functioning of the cooperative and the interest and loyalty of its members.

33. The labor assumptions were overoptimistic. A labor shortage appeared starting in the land-clearing stage, and it was necessary to recruit casual labor, sometimes from outside the area. Even now, although the project as a whole is able to obtain the amount of labor required for maintenance and harvesting, its distribution is extremely uneven (para. 29).

34. The actual labor situation is analyzed in a study made in 1973 in the Mono River Valley, where SONADER implements a similar oil palm venture partly financed by FED, and where the amount of time devoted to agricultural work has traditionally been about 100 days annually per active person. In retrospect it can be said that furnishing to the coops 50 days of additional work was a substantial increment in view of the other economic opportunities and social obligations of the farmers. In fact, i was mainly young people without family responsibilities who worked more than 50 days annually on the plantations. The other farmers worked in the cooperative only when they had no other opportunity for employment. This happened only occasionally, as suggested by the figures in para. 29. The difficulties encountered at the start of the project with the maintenance of the palm plantations arose chiefly from this lack of labor. That it has not become a major problem is mainly due to the cooperatives' acceptance of irregular workers as full members although the original legislation did not provide for this (para. 31).

35. The Annual Crop Areas (ZOCAs). The new permanent agricultural system developed at a local research center, at that time operated by French technicians, was based on the rotation of crops and intensive farming methods. The system had to be followed rigorously to yield results which would make it superior to the old system of shifting cultivation. Previously, the new system had been introduced without much success; in fact, all of SONADER's earlier experiments with it had foundered. Nonetheless, at appraisal, all agencies concerned believed that the new system was superior to the traditional one of shifting cultivation and felt that the farmers would adopt it.

36. From the outset the proposed system was not popular with the Hinvi farmers, who, as the PCR indicates (para. 4.15), preferred their traditional practices to the intensive project routine. It would appear that the new system did not meet all the needs of the farmers - the part devoted to food crops was too small, the yields obtained from commercial crops (groundnuts, cotton) were low and the planned rotation created serious labor constraints during the planting and harvesting periods. Since the rotation system was rigid and virtually obligatory, it is not surprising that in the early years the farmers stayed away from or abandoned the ZOCAs, preferring to grow their crops outside the project. The Bank, like FAC and SONADER, seems to have seriously overestimated the benefits that the farmers could derive from the new system. Subject to labor constraints, farmers did not assess the system in terms of its return per hectare - in which it was unquestionably superior to the traditional system - but rather in terms of its return per day worked - in which its superiority remains uncertain and probably small at best.

37. Later, relaxation of the cropping pattern routine and the introduction of ox-drawn cultivation brought about a radical change. The use of animal traction makes it possible to almost double the yields of the main crops while reducing the mandays needed per hectare at the critical moments of planting and weeding.

38. The PCR correctly notes that expansion of the use of animal traction faces a number of obstacles: the inability to supply oxen adapted to the conditions of the region, and financial limitations which prevent the farmers from acquiring a pair of these draft animals. The cost of a pair of oxen, together with the risks associated with the purchase (mortality of the animals, difficulty with repayments in years of low rainfall) and the additional work involved in looking after the animals, have persuaded the small and medium farmers to rent oxen. The rental system leaves the risk and the outlay - but also the profit - to the large operators. Without financial assistance for small and medium farmers, the introduction of animal traction is leading toward greater social differentiation. Thus, the Bank may have erred when it refused to help SONADER with the ZOCAs precisely at the time a solution seemed to be in sight. In 1971, when the project was reviewed, FAC stepped up its technical assistance to ZOCAs for developing animal traction, while the Bank reduced its contribution to this component of the project.

39. It is evident that the breakthrough brought about by ox-drawn cultivation has been only partial, and that other factors continue to depress planned activity on the ZOCAs. The audit mission found that:

(i) The crop rotation has been virtually abandoned. Maize accounts for about 80% of the ox-drawn cultivated areas and 90% of the hand cultivated areas. This monoculture responds to the greatly improved market for maize, in Benin and Nigeria, but threatens to exhaust the soil;

(ii) Fertilizer consumption remains extremely limited (4.5 tons total in 1976 versus 100 tons forecast at appraisal) and has been falling sharply since the rise in fertilizer prices in 1974;

(iii) The sum of (i) and (ii) result in a critical threat of soil degradation. This is one reason for the limited use (50%) of available area: farmers prefer to leave fallow land which they believe to be partly exhausted, in accordance with their traditional shifting system. Thus, ox-drawn cultivation alone is unlikely to bring about a new agricultural equilibrium as long as the problem of maintaining the fertility of the soil has not been resolved.

40. Role and Attitude of Women in the Project. During the preparation of the project no specific consideration was given to women, even though they were known to play a key role in food crop production, in the processing of wild oil palm fruits and in the marketing of oil and maize. The women have not yet given full support to the project: It has eliminated a good part of their annual income (processing and marketing), a loss which has been offset only in part by the possibility of obtaining paid work in the cooperative. Their participation in the cooperative is still limited: there are very few women "A" or "B" members. Nonetheless, their role has been important, especially in work requiring meticulous detail (preparation of nurseries and planting of legume cover). In 1973, SONADER recruited female personnel to set up a women's section responsible for a program of home economics and instruction on new cultivation techniques. Some additional measures (participation in cooperative structures, establishment of stores for the supply of staples, etc.) would undoubtedly increase the women's support for the project. That support is essential to its continued success, for the women can undermine the design. They might protest, for instance, by processing more fruit themselves instead of having them delivered to the mill (PCR, para. 4.10).

41. In the early stage of the project, the Bank's lack of attention to the needs of women farmers might be explained by its over-optimism about labor availability, which made the project appear less dependent upon female participation. The emerging labor shortage, however, and the large number of women in the nurseries, should have made the Bank more aware of the special role played by women in a project that had been designed mostly

with men in mind. The head of SONADER women's section commented that the audit mission was the first World Bank mission that had asked to meet with her.

Impact of the Government's Price Policy on the Project

42. Despite a recent increase in the produce price for oil palm fruit from CFAF 4.6-4.9/kg to 5.6-5.9/kg, the parallel market is still more attractive to the growers and the problem of fruit theft continues to be a concern to project authorities. The farmers apparently make more money by processing the fruit themselves than by delivering it to the mill. The mill, already operating below capacity, has again cut back its processing volume in 1977.

43. At the current price, the cooperatives can cover their operating costs but an average yield of at least six tons/ha is necessary to allow them to repay their 25-year loans and provide fair remuneration for manpower. At a yield of 5 tons, as obtained during recent years, the cooperatives will not be able to pay back either long-term loans for project investments or short-term borrowings in the form of cash advances granted by SONADER. This is not a deficiency of the cooperatives, which are operating efficiently and could only with difficulty reduce production costs.

44. The policy to help produce prices as low as possible has to be seen in the light of the budgetary problems faced by the Benin Government. Government is allowed thereby to use returns from this project to benefit other less favored areas. However, the funds that the Government would distribute to Hinvi farmers via a producer price increase would be partly returned to it in the form of loan repayments. Likewise, with mills operating below capacity, the fixed costs per unit processed are excessive. They would be reduced, and Government's average earning per ton increased, by an upward adjustment of the producers' price. The latter would be only a temporary outlay, which would be recovered by the Government over the long run. The increase would also strengthen the cooperatives to play a larger developmental role. For all these reasons, it seems urgent to bring remuneration of the farmers' production into line with market conditions, either by increasing the price itself, or by arranging for the cooperatives to share in the profits of the mill. 1/ The Bank was right in requesting continuously policy changes during project execution and the PCR is correct in its criticism of Government for not giving this matter the consideration it requires.

1/ It was originally planned that the cooperatives would be federated into a cooperative union which was eventually to take over responsibility for the mill. If this idea is abandoned, the question of distribution of the mill's surplus, after normal repayment of loans, will still have to be settled.

Economic Rate of Return

45. The pre-appraisal mission assessed project risks and concluded that even if the economic return was marginal at best, the project was justified for other reasons, such as a good institutional base and a lack of other investment opportunities in the agriculture sector in Benin.

46. The appraisal report echoed the warnings of the previous mission, but the quantitative analysis provided a more optimistic report. Production values proposed by these two missions, and those originally suggested by SONADER, are as follows:

Annual Gross Income in Operation	SONADER Estimate (millions CFAF)	Pre-appraisal Estimate (millions CFAF)	Appraisal Estimate (millions CFAF)
Palm oil	486	424	340
Palm kernel	115	65	49
Annual crops	139	46	250
Total	740	535	639

The major role assigned to annual crops in the appraisal design was not found in the earlier proposals. Given the failure of previous SONADER trials with annual crops, appraisal's faith in the successful outcome of this component seems unwarranted. There were, on the contrary, numerous signs that it was over-optimistic. By overestimating the annual crop component the Bank was unnecessarily trying to provide to the proposal a stronger economic justification, and this in spite of the fact that the Bank knew the project was justified for reasons other than its economic impact.

47. The ROR estimate, important at the time of project appraisal, seems to have been ignored during project execution. When, following the 1971 SONADER crisis, the Bank revised project costs, it reduced those attributed to the ZOCAs and increased those to the mill (PCR, para. 3.09). Contrary to the position of FAC, the Bank did not find it appropriate to assist in developing ox-drawn cultivation. At the time, doubts existed about the appropriateness of ox-drawn cultivation as a way to make the ZOCAs more attractive to the farmers and the prospects for livestock and annual crops development remained therefore uncertain. Furthermore, the Bank had limited experience with ox-drawn cultivation. Thus, the Bank was reluctant to support SONADER's initiative. But the main constraint according to Bank staff was financial: the Bank had only US$600,000 available and was committed to finance 100% of the cost of the mill. It therefore withdrew its support to the ZOCAs to meet the full cost of constructing the mill. The Bank was thereby cutting itself adrift from its own appraisal analysis, since annual crops were intended to provide 40% of project earnings (see table above).

Abandonment of the ZOCA by the Bank implied that project's ROR would be driven below zero. There is no indication in Bank documents, however, that the decision to reduce efforts in the ZOCAs was taken in association with an analysis of the impact on the ROR. The ROR was no longer emphasized as a decision-making tool, even when significant changes in project components were being considered. It is fortunate that FAC continued to promote the development of ox-drawn cultivation, because the annual crop component has been essential in maintaining a positive ROR.

48. Unrealistic assumptions in previous ROR calculations have been corrected in the PCR. Yield estimates take into account possible future poor rainfall conditions, areas cultivated in the ZOCAs have been assumed to remain unchanged (PCR, para. 5.01), and labor has been costed at close to market price. For the reasons outlined in the preappraisal report (PCR, para. 1.04), the low rate of return is not an indication that the investment should not have been carried out.

III. CONCLUSIONS

49. On the basis of economic returns, the project does not compare favorably with the appraisal forecasts. The new ROR estimate at most reaches 5%, far below the 12% forecast by the appraisal mission. Output has undoubtedly suffered from poor rainfall in the period. Nevertheless, even with palm yields equal to those estimated in the original appraisal, the project would not reach the forecast ROR since the production of annual crops is far below expectations. That result is explained with reasons largely unconnected with climatic conditions and which were foreseeable at the time of appraisal. A more in-depth analysis then of the project setting, and appraisal figures more in line with the uncertainties expressed in the text of the appraisal report, would have led to a more realistic ROR, and the final result would not be disappointing.

50. In any event, the audit mission considers that the economic aspects of this project are of considerably less interest than the institutional aspects. The institutions set up have proven to be efficient and show a great capacity for self-betterment. SONADER is remarkable in that it is entirely managed by nationals who required only a minimum of foreign technical assistance to complete the development program in the alloted time. The cooperatives evidence interesting characteristics and are a rare example of successful deployment of rural community organization in a Bank project. The ability of SONADER and the cooperatives to continue to pursue their development will depend on the support that the Government

provides them in the form of continued integration of the activities now embraced by SONADER's single organization, fair prices for cooperative products, and adaptation of the legislation governing the cooperatives to the new needs which have arisen since their establishment. Nonetheless, SONADER's and the cooperatives' satisfactory performance to date allows a greater confidence in the future of Hinvi than for the other three projects analyzed simultaneously by OED (see Preface), particularly for the period after the end of Bank assistance, in the absence of second-phase projects.

51. The Bank's review of on-farm conditions was superficial. Benefits that farmers obtained from their traditional cultivation system, and the farmer's perception of those benefits, were under-estimated, and potential benefits from the new annual crops program were over-estimated. The Bank also seriously over-estimated the farmer's availability of labor. The common appraisal assumption in the Bank's smallholder projects, that the opportunity cost of the smallholder family's labor is zero, holds in none of the four projects visited. Hence farmers' likelihood to participate in the projects should be measured in terms of returns per manday as much or more than returns per hectare. Furthermore, detailed studies of seasonal labor bottlenecks and the role of women and of younger family members who form a major part of the available labor force, appear to be justified at appraisal and during project implementation to determine possible constraints to their full effect on or participation in the project.

BENIN
HINVI AGRICULTURAL PROJECT
CREDIT 144-DA
COMPLETION REPORT

TABLE OF CONTENTS

1 The report refers to SONADER, the agency responsible for project implementation. Since 1976, SONADER has become SOBEPALM (Societe Beninoise de Palmiers a Huile).

I. BACKGROUND, PREPARATION AND APPRAISAL

1.01 The possibility of Bank involvement in oil palm development in Benin was discussed by an FAO/IBRD CP mission in a report dated April 1965. This report concluded that the ongoing program of planting 2,500 hectares of oil-palm annually was likely to be financed by FAC and FED at least until 1968, and there was therefore no room for immediate Bank involvement. The CP report did however point out that production from the ongoing program would not meet projected requirements of palm oil for export. During 1966, because of a growing reluctance of FAC and FED to carry the full burden of external financing for the proposed project, the Government requested assistance from the Bank. PMWA then collaborated with SONADER to prepare a project during the latter months of 1966. This was followed by a pre-appraisal mission in March 1967, appraisal in July 1967 and reappraisal in August 1968; the Credit Agreement became effective in August 1969.

1.02 From the beginning it was recognized that the agricultural elements of the project, namely development of oil palm in ten cooperatively owned blocks of about 600 ha each, and development of annual food crops on the holdings of individual cooperator/farmers, would be subject to a number of constraints. For instance, the pre-appraisal report said "conditions for planted (oil) palms are marginal and yields are likely to be 50 percent of those in the most favorable areas of West Africa" (P.A.R. para 2.07 of appraisal report). The incorporation of oil palm plantations with food crop growing and small holdings had also been the subject of a number of negative experiments but it was believed the problem had been overcome (P.A.R. paras 2.10 - 2.12. See footnote).

1.03 As regards the field crops it was feared that the cooperative organisation proposed might mean that the farmer cooperators would neglect either field crops or oil palms, and although it was felt that it had been carefully thought out, "time alone (would) show its effectiveness" (P.A.R. para 3.20).

1.04 In spite of these reservations, the preappraisal report concluded that there were "no other investment opportunities which offer more favorable prospects than this project in the agricultural sector", (P.A.R. para 5.01). If the appraisal mission could satisfy itself that the cooperators could "produce as much from the field crop areas as they could without the project" and that productivity could be increased by the project, the project would probably be judged economically viable (P.A.R. para 5.03). The delay of nineteen months between the first appraisal mission and the issue of the appraisal report as "due to the political instability following the change of government in December 1967 and the precarious financial situation in Benin which prevented FAC and IDA from proceeding with the project until the end of summer 1968." (P-670 5/2/69).

Note: In this paper, References to documents are as follows:

P.A.R. Pre-Appraisal Report dated 1st June 1967, Memorandum from Rowe, Vigie, Bishop and von Czernicki to Evans.

P-670 Report and Recommendation of the President, dated 5th February 1969.

A.R. Appraisal Report. Report on Hinvi Agricultural Development Project, TO-615b, dated 3rd February 1969.

S.M.R. Supervision Mission Report.

1.05 The appraisal report did not differ substantially from the pre-appraisal report in its general assessment of the situation. It confirmed both the misgivings about the suitability of the area for oil palm (A.R. para 3.02) and the judgement about SONADER's capacity to execute the project. "SONADER is completely Africanized and displays a high level of competence, both at its head office and in the field. It is efficient, and has gained considerable experience in agricultural development and the organization and management of producer cooperatives. SONADER is capable of handling an expanded programme including the proposed project. It is of the utmost importance to the continued success of SONADER's operations that the quality of its senior staff is maintained" (A.R. para 6.02). This refreshing and rather rare confidence in the ability of an institution to carry out a development project, was, as will be seen, on the whole, well-justified.

1.06 Unfortunately the appraisal report devotes relatively little attention to the constraints on annual crop production. This had been picked out in the reappraisal report as a key issue; income from annual crops was an important element of the total incremental income and in the favorable economic evaluation of the project. In the event the relatively meagre success of annual crop development almost caused the project to founder during implementation. Thus it is unfortunate that this issue was not given more prominence at the time of appraisal.

II. THE PROJECT

A. Project Description and Objectives

2.01 The Appraisal Report summarises the project and its principal objectives as follows:

- establishing and bringing to maturity 6,000 ha of oil palms;
- preparing 6,000 ha for annual crop production;
- constructing a palm oil factory with an ultimate annual capacity of 70,000 tons of ffb;
- planting 1,000 ha of teak and cassia trees;
- purchasing 310 cattle for the development of beef production;
- constructing maize storage silo with an ultimate capacity of 3,000 tons;
- developing necessary roads and central project facilities.

Development, and subsequent production, was to be organized through ten cooperative units - each with 600 ha of oil palms and 600 ha of annual crops. During the first 25 years of project development and operation, the Societe Nationale de Developpement Rural (SONADER) was to have full responsibility for managing the project, and directing cooperative activity. Subsequently, the ten cooperatives were to become lessees of the land and owners of the improvements described above. SONADER was to train required cooperative staff, and to meet cooperative staffing costs during the development period.

2.02 The main objective of the project was to develop an efficient and modern system of agricultural production, capable of assuring participating farmers of standards of living superior to those obtainable from traditional farming methods. In achieving this, the project was to increase the production, and maintain,

while initially increasing, exports of oil palm produce from Benin.

2.03 Incremental production generated by the project was expected to be as follows: (per year)

	1975	At Maturity (1980)
Palm Oil (Tons)	4,275	10,080
Palm Kernels (Tons)	1,395	2,400
Máize (Tons)	6,535	8,739*
Groundnuts (Tons)	1,582	1,920*
Seed Cotton (Tons)	1,338	1,600
Livestock (Adult Head)	60	62*
Teak (Poles)		70,000 (approx.)

The annual value of incremental production was estimated to amount to US$1.3 million in 1975 and to US$2.4 million in 1980 (at 1969 prices).

B. Project Costs and Financial Arrangements

2.04 Estimates of Project costs are summarized in the following table:

Original Project Cost Estimates

	Local Currency			US$		
	Local Currency	Foreign Exchange	Total Costs	Local Currency	Foreign Exchange	Total Costs
	-------CFAF Million----			-------US$ '000--------		
Studies	8	32	40	32	130	162
Oil Palm Development	708	237	945	2,870	956	3,826
Oil Palm Factory	64	492	556	255	1,992	2,247
Annual Crop Development	165	32	197	668	129	797
Livestock	34	3	37	138	12	150
Afforestation	25	4	29	101	16	117
Staff and Training	36	4	40	146	16	162
Villages, Roads, Vehicles,etc.	75	119	194	304	481	785
Maize Silos	4	36	40	16	146	162
Overheads and Maintenance	80	44	124	324	178	502
Contingencies	84	84	168	340	340	680
Total	1,283	1,087	2,370	5,194	4,396	9,590

2.05 Fonds d'Aide et de Cooperation (FAC) of France participated in financing the project as shown in the following agreed financing plan:

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* The annual production of these commodities was expected to increase slightly in subsequent years up to 385,000 poles in the period 1980-84.

Financing Plan

Source	Foreign Exchange	Local Currency	Total Financing	Percentage
	US$ Million			
IDA	2.8	1.8	4.6	47.9
FAC	1.6	3.0	4.6	47.9
Government of Benin	-	0.4	0.4	4.2
Total	4.4	5.2	9.6	100.0

2.06 As explained in the President's Report and Recommendation, the financing arrangement with FAC meant that "the amount of IDA financing (was) substantially the equivalent of the foreign exchange component of the whole project" (P-670, para 11). The large proportion of external financing was conditioned by the fact that Benin was suffering financial difficulties at that time; was dependent on France for considerable current budget support; and could not be expected to make a large contribution to development expenditures.

2.07 It was proposed that "IDA and FAC financing would be parallel in part, and the remainder joint. All goods and services financed wholly by IDA, valued at $2.7 million, and all goods and services financed jointly by IDA and FAC, valued at $5.8 million, would be procured through international competitive bidding, except for contracts of $50,000 equivalent or less which would be awarded on the basis of local competitive bidding in accordance with procedures acceptable to IDA. Goods and services financed wholly by FAC, valued at $0.7 million, would be procured within the Franc zone in accordance with FAC's normal procurement procedures." (P-670, para 12).

2.08 Internal financing arrangements were that Government would (a) on-lend the IDA credit to SONADER at 6% interest for a term of 25 years including 9 years of grace and (b) onlend the proceeds of the FAC grant to SONADER for a term of 31 years with varying interest rates of 0.75% to 2.5%, repayment to be to Fonds Dahomeyen de Renouvellement de la Palmeraie, a fund established, at FAC insistence, for the purpose of financing a continuing program of oil palm development. The Government contribution was to reimburse SONADER for the tax and duty component of goods purchased by SONADER in Benin. Direct imports were to be free of import duties.

C. Organisation and Management

2.09 The organisation of the project involved two principal elements (a) SONADER, with overall responsibility for management of the project and the affairs of the cooperatives elements; (b) ten producer cooperatives that were expected to comprise 4,000 farm families each working 1.5 ha of oil palms and 1.5 ha of arable crops. (para 2.15).

2.10 SONADER. As its name implied, SONADER had in principle very wide statutory responsibilities for rural development, but in practice, when the project was under discussion, these responsibilities were limited to fostering oil palm development with lesser emphasis on food crop development in the oil palm areas.

During project formulation SONADER was also given responsibility for ownership and management of the oil mill which would eventually have to be built; this was done because of the evident weaknesses of SNAHDA, the already existing organisation responsible for managing the four oil mills then in operation. Also during formulation, but not discovered by the Bank or FAC until the loan was just about to become effective, SONADER was given responsibility for all rural development activities in the Mono River Valley. The first supervision mission judged that "These responsibilities cannot be undertaken without adversely affecting the progress of SONADER's existing activities" (SMR 26/6/69 para 7). This, together with doubts about its ability to keep adequate financial records, was the only reservation expressed about SONADER's competence to execute the project.

2.11 Farmer participation in the project was not entirely voluntary, since SONADER was legally entitled to:

- oblige land owners in designated development areas to group themselves into producer cooperatives, or alternatively;

- oblige land owners in development areas to rent their land to producer cooperatives, established by the agency; and

- supervise and control, for 25 years, producer cooperatives established in the above manner.

2.12 Physical development was to be directly executed by SONADER with its own staff and funds, and was to include establishment of the oil palm plantations, tree plantings, and cattle herds; road and palm oil factory construction, and the clearing and development of village sites and annual crops areas.

2.13 For the 25-year life of the project SONADER was to manage on behalf of the cooperatives the oil palm plantations, the blocks of annual crops and all productive components of the project, except the oil mill which would be SONADER property. During this period SONADER was to have complete managerial, administrative, and financial control of the cooperatives; all revenues were to accrue to SONADER, and only after all costs, including loan repayments, had been met, would the surplus be paid to the cooperatives. During the development period the ten cooperatives, and an apex organization -- the Cooperative Union, were to be created by SONADER and gradually take over responsibility for management. SONADER had legal power to take over the direction of the cooperatives or even to dissolve them in the event of unsatisfactory performance. In practice, and since the ten cooperatives would be financially indebted to SONADER, the latter was expected to be able to exert a high level of direct control over them for the first 25 years of their existence. It was recognized that only after this time, and after discharge of their debt to SONADER would the cooperatives become autonomous. SONADER was thus required to play two distinct roles in development and operation of the project. First as a development agency, and second as a managing agent for the cooperatives.

2.14 The Cooperatives. Each of the project's ten cooperatives was expected eventually to manage about 600 ha of oil palms, 600 ha of annual crops, and associated tree plantings, cattle, and buildings and equipment.

2.15 Farmers could become members of the cooperatives by leasing land to

the cooperative on a fifty-year basis, by working on the oil palm plantations or both. In compensation the farmers received shares in the cooperative which entitled them to a fixed return. In addition farmers who contributed labor were entitled to a daily cash renumeration plus a share in the profits of the cooperative.

2.16 Each hectare rented to the cooperative entitled its owner to one "A" share and an interest of CFAF 900 (US$3.60) per year. Farmers working for a minimum of two hundred days per year were entitled to a "B" share. Both types of share were valued at CFAF 30,000 (US$120). Farmers qualifying for "B" shares received CFAF 125 (US$0.50) for each days work on the oil palm plantation. Since the "official" daily wage in the project area was CFAF 275 (US$1.1), the farmers were considered to be contributing CFAF 150 (US$0.6) in value of work per day to the project, or CFAF 30,000 (US$120) total. "B" share farmers also received 1.5 ha of cleared land from the cooperative, which they were under an obligation to cultivate in the manner prescribed by SONADER. Any surplus after payment of interest on "B" shares was to be used for capital improvements and to increase the daily wage for workers in the plantations.

2.17 The 1.5 (1.4 net) ha holdings of annual crops were to be worked by cooperative members and their families as individual enterprises, the produce from these being their sole property. The cooperatives, however, were to require farmers to follow a specific rotation for 1.2 ha of each plot. On the remaining 0.2 ha, farmers were to be free to grow what they please. The cooperatives would provide seeds, fertilizer and other inputs which would be paid for by farmers, and marketing and storage facilities. Farmers would have the choice of whether or not to use the latter.

2.18 By way of comment, the provisions for "B" shares and annual crop holdings, were clearly based on the assumptions (i) that there was a surplus of labor in the project area, so that farmers would be willing to work for low wages on the oil palm plantations, and (ii) that the required rotation for the annual crops was sufficiently profitable to be attractive to farmers. In the event neither assumption was justified, and this was one of the factors which eventually caused the project to be substantially revised.

2.19 The ten project cooperatives were to be grouped into a Cooperative Union, which eventually would own the palm oil factory, maize silos and other central facilities. As in the case of the individual cooperatives, the Cooperative Union was to be managed by SONADER for 25 years.

III. IMPLEMENTATION

A. Chronological Review

3.01 Because of the delays mentioned above, implementation of the project started before the credit became effective. However, while the oil palm plantating programme got off to a good start and was completed in accordance with forecasts, the annual crop element was much less successful. From the beginning, supervision missions expressed doubts about progress. By June, 1971, about 1,500 ha of land for annual crops had been cleared, as compared with forecasts at appraisal of 1,750 ha, nevertheless only about 700 ha were being cultivated, and there was a marked lack of demand for cleared land.

3.02 In addition, by mid-April, detailed planning for the oil mill showed that a 20 ton/hour mill was necessary, with provision for increase to 40 ton/hour mill, as compared with the 24 ton/hour mill to be constructed in two stages which was provided for in the project. The increased mill size was required because other milling capacity was no longer available to process oil palm bunches produced by the project.

3.03 Finally the increasing responsibilities laid on SONADER by the Government, principally its continuing involvement in the Mono Project and in rapidly increasing oil palm development in addition to the Hinvi project, seemed to be straining its executive ability and endangering its capacity to implement the project. This was evidenced by poor financial and administrative control of the cooperatives, by financial control of its own operations, and poor maintenance of the plantations.

3.04 In order to rectify the situation a substantial revision was made to the project in 1971. Essentially this involved abandoning any further annual crop development (though FAC insisted on bringing the remainder of the cleared land under cultivation, financed out of its own contribution); utilising the funds so saved to provide the necessary extra finance for the oil mill; and effecting a reorganisation of SONADER so as to achieve tighter supervision of the cooperatives and field control of the plantations.

3.05 After this substantial revision, the project continued to make progress, but with difficulty. The oil mill was constructed, but could not be commissioned on time, because of problems with the water supply. There were difficulties over procurement for the mill auxiliary installation because of collusion between bidders. On the bright side, the annual crop programme began to show positive results as a result of the introduction of ox-teams for farm operations, and the beef cattle enterprise began to benefit from better management.

3.06 Underlying everything were the continuous financial problems of SONADER. These were compounded of SONADER's inability to establish and maintain an adequate system of financial planning and control, and by its fragile financial situation. These financial difficulties came to a head in 1973, with successive devaluations of the US dollar in relation to the CFAF, and in January 1974, a supplemental credit of $600,000 was agreed upon.

3.07 In the end, the project as revised was completed on time in mid 1976. By then, the 6,000 ha of oil palm were in production; the oil mill began operating in 1974; about 1,500 ha of annual crops were being farmed, part of it cultivated by ox-drawn equipment. Yields from the oil-palms cannot yet be forecast with accuracy, but have recovered from the adverse effect of the drought. One problem which was never solved was the weakness of the accounting procedures and financial control of SONADER.

B. Project Revisions

3.08 The revisions made to the project in 1971 involved the following:

a) change from construction of the mill in two phases (first 16 ton ffb/h and second 24 tons ffb/h) to construction of a single,

20 ton/h mill, with room for expansion to 40 ton/h if required later;

b) increase in cost of the mill to allow for price escalation and also extra ancillary facilities;

c) reduction of annual crop area from 6,000 ha to 1,700 ha;

d) reduction of maize silo capacity from 3,000 to 2,000 ton.

3.09 These changes led to revised project cost estimates, as shown below:

CFAF	Appraisal	Revised	
	--------CFAF Million-----		
Oil Mill	.556	1.369	1/
Maize Silos	.040	-	
Oil Palm Development	.945	1.076	
Other Ag. Development	.262	.111	
Infrastructure	.158	.202	
Administration	.179	.212	
Studies	.040	.036	
Contingency	.189	.035	
Total	2.370	3.021	

1/ including the second line with total output of 40 t/hour.

3.10 These revisions were agreed to by the Executive Directors on September 13, 1971, (IDA R71-63), and the project description was amended appropriately.

3.11 It should be noted that this revised funding was based on the assumption that FAC would provide CFAF 1,235.6 million (US$4.5 million), IDA CFAF 1,269.9 million (US$4.6 million) and the remaining CFAF 515.8 million (US$2 million) would come from the Government (CFAF 145 million) and SONADER self-generated funds (CFAF 370.8 million). Government contribution has never been paid and this was one of the causes for SONADER's continuing financial problems. The installation of a second processing line has been postponed because of lower production than expected. Subsequently, under the adverse impact of currency realignments (US$/CFAF exchange rate declining from 1:277 to 1:225) Credit 144-IDA was increased in February 1974 by US$600,000 to US$5.2 million. In late 1973, FAC also increased its grant contribution by US$510,000 equivalent.

3.12 The following tables show the finally agreed financing plan, and the planned disposition of the revised IDA credit.

Final Planned Disposition of IDA Credit
US$ '000

Category I	Studies and construction of palm oil mill, associated installations and vehicles.	4,158
Category II	(a) Development of oil palm plantations	830
	(b) Other agricultural development	159
Category III	Contingencies	53
	Total	5,200

C. Costs, Disbursements and Procurement

3.13 The following table compares appraisal estimates of project cost with actual disbursements.

	Actual				Appraisal
	CFAF Million				CFAF Million (US$ 1 = 247)
	IDA	FAC	Govt	Total	Total
Studies	-	40	-	40	40
Oil palm development	230.9	458.5	-	689.5	945
Oil palm mill	962.4	-	-	962.4	556
Annual crop development	-	201.0	4.2	205.2	197
Livestock	1.0	5.9	0.9	7.8	37
Afforestation	-	5.7	14.7	20.4	29
Staff and training	25.9	53.7	-	78.6	40
Village sites, roads vehicles, etc.	7.3	94.0	18.1	119.4	194
Maize silos	-	40.3	-	40.3	40
Overheads and Maintenance	9.0	66.9	14.9	90.8	124
Contingencies	-	-	-	-	168
Rent	-	-	10.8	10.8	-
Total .	1,236.5	966.0	63.6	2,266.2	2,370

3.14 These costs have been determined through the analysis of disbursement files kept at SONADER. Costs related to contracts or suppliers invoices are accurate; land development cost (oil palm and annual crops at forestation) overheads and infrastructure are based on SONADER's allocations to project cost without regard to actual costs which are unknown (even by SONADER) and for which it is impossible to obtain further details. IDA supervision missions have recommended many times that SONADER take action to improve the accounting procedures. In 1974 and 1975 FED had financed a consultant, SORGEM, to train staff and establish new procedures but this action has not brought any significant results. Balance sheets and financial statements, although more accurate, are still unaudited and issued late, budgetary control and financial management remain weak. SONADER has generally followed IDA guideline for procurement, in particular for the oil mill. However, an IDA supervision mission recommended in 1974 to not finance the exaggerated cost of a water tower (US$150,000) since the contract was awarded without IDA consultation. This recommendation has not been followed ultimately because SONADER would have had to pay for a Government mistake and this could have aggravated project execution.

3.15 Disbursement and procurement were complicated. Until the 1971 revision FAC paid 100% for some items and FAC and IDA shared in the proportion 54 to 46, for the oil palm plantations; staff and training; village sites, roads etc; livestock; and overheads and maintenance. Thereafter IDA paid 100% for the ancillary facilities; the oil palm plantations and staff and training continued to be shared as before; all the rest were paid for 100% by FAC. Prior to 1969, FAC of course paid everything.

IV. EVALUATION

4.01 For review purposes the project can be divided into three parts: (a) the productive components; (b) institutions; and (c) cooperative and social aspects.

A- Productive Components

4.02 a) Establishing and Bringing to Maturity 6,000 ha of Oil Palms

	Planned and Actual Plantings			
Calendar Year	1968	1969	1970	Total
ha planted-planned	1,800	1,800	2,400	6,000
actual	1,835	1,842	2,403	6,075

Plantings, as shown by the table, were on schedule and made with high potential seedlings of good physical quality. Maintenance was generally good through 1971 and an invasion by the spear grass weed (imperata spp) extending to 1,070 ha had been cleared up by the beginning of the 1972 wet season. In 1972, however, a general fall in maintenance standards occured and has not been corrected to date. The basic cause is financial. Cooperators are unwilling to work for the CFAF 125/day paid by SONADER to the cooperatives for maintenance work in the immature plantations, unless no other work is available, as during the dry season, when there is no difficulty in obtaining labour. Thus during the rainy season maintenance is less than would be acceptable an commercial estates elsewhere. To correct the situation, SONADER has begun to use machinery for

maintenance specially financed by FAC. However, it is unlikely that yield depression because of low maintenance is significant. Moreover, because of the low yield potential of the area it is doubtful whether a large increase in maintenance costs is economically justifiable.

4.03 Despite the excellent performance in planting, and reasonable maintenance, it is not clear at present whether or not yields will reach the levels anticipated at appraisal. This is due to the low rainfall experienced in 1971/72 and 1972/73 which occured at a critical time in the early growth of the plantations. Also it may be that the rainfall pattern is more unfavourable than was at first thought.

4.04 The attached table shows the distribution of rainfall by crop-year and by plantation. The overall average crop-year rainfall for the years 1969/70 to 1974/75 in the project area was about 980 mm as compared with about 1,170 mm during the years 1941-1966 at Niaouli on the boundary of the project area. However, two of the plantations had rainfall within 5% of the Niaouli 25-year average. Within the project area there were considerable differences between the plantations, that with the least rainfall, Dodji-Sehe, having about 1/3 less than that with the most, Agbotagan. These data do not show any apparent geographical pattern when plotted on a map.

4.05 From the point of view of oil palm growth and development, a very significant constraint is the incidence of long dry spells. However, measured by the number of three monthly periods with rainfall of less than 100 mm, the drier plantations do not appear to be much worse in this respect than are the plantations with high rainfall.

4.06 On the basis of data available, it seems clear that the substantial differences between plantations was an adverse factor unknown to the appraisal mission. Furthermore the abnormally low rainfall of two years has substantially affected the six-year average. However, all years were below the Niaouli average and only two years were within 10% of it. Thus it seems possible that the long-term average rainfall in the project area, and hence yields, will be somewhat lower than that envisaged at appraisal.

4.07 The following table shows original and revised estimates of future yields.

Comparative Yields - Estimated and Revised
Tons ffb/ha

Years after Planting	5	6	7	8	9	10	11	and 12 Subsequent
Appraisal Estimates (1969)	3.0	5.0	6.5	7.5	8.0	8.0	8.0	
Revised IRHO (1973)	0.5	1.5	3.0	4.0	6.0	8.0	8.0	
Revised Bank (1973)	0.3	1.7	2.3	3.6	5.6	6.3	7.0	
Last Estimates (1976)	0.5	1.5	3.0	4.0	6.0	7.0	7.0	

4.08 Harvesting of ffb started in the first three months of 1973, when 116 tons were produced by the cooperatives of Agbotagon and Goulo, planted in early 1968. Thereafter the progression of yields and production is as follows:

Agricultural Year

	1973/4		1974/5	
	Yield Tons/ha	Production Tons	Yield Tons/ha	Production Tons
	(6th year after planting)		(7th year after planting)	
Agbotagon	2.939	1.184.890	2.626	1,605.050
Attogon	0.704	429.972	2.490	1,519.360
Goulo	2.318	1,423.473	1.875	1,151.396
	(5th year after planting)		(6th year after planting)	
Koundokapoe	0.221	137.954	1.864	1,153.874
Sedje			1.099	661.063
Rodji			0.629	391.600
			(5th year after planting)	
Sehe				68.330
		3,176.289		6,550.676

4.09 The above figures show that in the sixth year after planting, average yields over the project area were about 1.4 ton/ha, which is much lower than the appraisal estimate, but about in line with the revised Bank and IRHO estimates of 1973. Furthermore the average yield should be adjusted to allow for the fact that only about 300 ha at Attogon were productive that year, the remainder having been burnt.

4.10 Any estimate of how production is now likely to develop must take into account two further factors, the incidence of fire, and of theft. During the first three months of 1973, 465 ha of trees were burnt as a result of fires spreading from where farmers were burning their fields. However, that was an abnormally dry period, and the problem has not reoccured.

4.11 Theft, accentuated by inadequate organization of ppb collection is however an important problem which could jeopardise the viability of the project. For instance, the Report of SONADER for 2nd Quarter of 1975, para 6.3, refers to "the eternal problem of theft of fruit bunches". Essentially it is due to the low prices paid to the cooperatives for ffb (about 3.8 frs per kilo of ffb) which in turn affects the cash earnings of the workers on the plantations and cooperative cash flow.

b) Annual Crop Development

4.12 The object of the annual crop development component of the project was (i) to introduce a system of rotational cropping to replace the "shifting cultivation" generally practised in the project area; and (ii) to promote the use of the seed of improved varieties, fertilisers and other inputs. Through these measures it was expected that substantial gains in productivity would be achieved and that the average participating family, would achieve a cash income from annual crops alone of about CFAF 42,150 (US$172) in 1980, as compared with about CFAF 12,000 (US$49) cash income annually without the project (constant 1967 CFAF).

4.13 The proposals concerning annual crops were that (i) a standard 1.5 ha holding (1.4 ha net) should follow a rotation which, under the two-season rainfall regime of the project area, would permit the cultivation each-year of 0.4 ha groundnuts, 0.4 ha cotton, 1.2 ha maize, and 0.2 ha of other crops; and (ii) the use of seed of improved varieties, fertilisers and other inputs, would permit average yields to rise by 1980 to 1,260 kg/ha (in shell) for groundnuts, 1,000 kg/ha (seed cotton) for cotton, and 2,300 kg/ha (grai) for maize. It was assumed that cultivation would continue to be by hand.

4.14 It was expected that the annual crop blocks would be developed quite rapidly as follows:

1968	1969	1970	1971	1972	1973	1974	1975	1976
			ha (Cumulative)					
317	600	1,150	1,750	2,400	3,300	4,200	5,200	6,000

The blocks were to be cleared by SONADER which also was to mark out the individual holdings and construct access roads. While 1.5 ha was to be the norm, families with sufficient labor were to be permitted to operate two holdings, but 3 ha was the absolute maximum allotable to an individual cooperator.

4.15 The annual crop development program soon ran into difficulties: fewer than expected farmers were prepared to take up holdings, input use was minimal and yields failed to reach appraisal targets. A Bank supervision mission in early 1971 attributed the failure to (a) farmers' unwillingness to give up traditional systems of cultivation and adopt a complex rotation requiring a high degree of discipline; (b) poor results of cotton cultivation, a result of heavy insect infestation; (c) low yields and prices for groundnuts; and (d) the lack of agricultural credit and markets at assured prices. For all these reasons, farmers preferred to clear and cultivate small areas of bush for their own food crop requirements in the traditional manner, rather than take up cooperative plots with the attendant obligations. The mission concluded that by 1976 (the closing date for the IDA credit) 3,000 ha might be developed if solutions were found to the above problems and some changes made to the rotation. Subsequently, however, it was agreed to limit further work to the preparation of 1,700 ha for annual cropping.

4.16 Since 1971 an unforeseen development has revitalized the annual crop component of the project. This is the introduction of draft oxen and plows, harrows, cultivators and carts with technical assistance financed by FAC. Original trials with draft oxen started in 1969, and the number of animal traction units (two oxen and equipment) has grown quite rapidly,as has the number of farmers using animal traction (farmers who owns units rent these to other growers). Thus in the 1975 crop season a total of 751 ha (442 main season; 309 short season) were cultivated with about 150 pairs of oxen and some 3,300 haulage trips were made with ox-drawn carts.

4.17 In the ten cooperatives 880 farmers used ox-drawn cultivation provided by 155 units. The benefits of ox-drawn cultivation are perceived by farmers to be so substantial that most of the 6,262 ha available for annual cropping have been taken up by farmers who are using hand cultivation until such time as they can obtain oxen and equipment. A requirement to receive credit for oxen and equipment purchase is that the farmer has removed all the stumps and roots from his land, a very substantial undertaking in the so-called ZOCA (zones de culture attelée) where only 1,700 ha were prepared by SONADER and where even this involved simply cutting off trees and shrubs at ground level. Despite the work involved and the further requirement that the farmer must make a downpayment of CFAF 30,000 (US$120) for his oxen and equipment, 746 had been de-stumped by March 1976.

4.18 The benefits of ox-drawn cultivation are the higher yields permitted by timely planting and weeding at times of the year when labor shortage is the principal constraint. Derived from a sample survey, SONADER estimates of yields for 1973-1975 are as follows:

Comparison of Yields from Hand Cultivated and Ox-Drawn Equipment Cultivated Farms

Crop	Year	Main Season		Short Season		Main Season		Short Season		Farmers		
		Hand	Ox-Drawn	Hand	Ox-Drawn	Hand	Ox-Drawn	Hand	Ox-Drawn	Hand	Ox-Drawn	Total
		Ha Cultivated				Yields, kg /ha				Numbers		
Maize (grain)	1973	793	111	600	64	1,510	2,585	582	2,505	1,440	352	1,792
	1974	954	289	624	149	1,000	2,800	900	2,100	2,426	799	3,225
	1975	996	380	1,188	304	1,100	2,300	1,000	1,900	2,099	880	2,979
Groundnuts (in shell)	1973	16	16	7	21	1,580	2,505	1,521	2,550			
	1974	31	28	28	45	1,000	3,000	1,300	1,900			
	1975	55	38	13	80	1,800	2,000	800	1,800			
Cowpeas (grain)	1973	45	5	-	2	N/A	598	571	588			
	1974	20	12	5	8	800	1,100	N/A	800			
	1975	20	21	7	12	700	1,000	300	400			
otton Seed otton)	1973	-	-	-	46	-	-	-	599			
	1974	-	-	-	-	-	-	-	500			
	1975	-	-	-	53	-	-	-	400			

4.19 The table shows clearly the growing number of farmers and area involved in annual cultivation, and the substantial increases in maize and groundnut yields thus achieved. The latter would be significant even if SONADER's recording is faulty, and explains the high demand among farmers to acquire these facilities. The table also shows the generally poor performance of cotton, and the room for improvement in cowpea yields, though the sample is scarcely large enough to draw substantial conclusions.

4.20 It does however, seem fair to suppose that the appraisal estimates of yield for maize and groundnuts will by and large be reached by 1980, not only on the revised area of 1,700 ha but also on the whole of the originally projected 6,000 ha, provided that there is no check to the introduction of animal-drawn cultivation. The most recent reports suggest that there are some constraints on the supply of animal for this, which is a matter to which SONADER and Government should devote attention in the future.

4.21 In short, the annual crops program has now reached the point where it should provide a sound basis for further development; however, the above satisfactory results are likely to be eroded: SONADER has not been able to organise the development of animal traction since 1974, because of the difficulty to purchase oxen at low prices fixed by Government. This could rapidly discourage farmers.

4.22 Livestock. The project included the purchase of 310 cattle for the development of beef production. Cattle has been purchased accordingly and allocated to 10 cooperatives, including the four financed by FAC. In 1975, the herd was 1030 heads. Veterinary services are adequate and the herd develop satisfactorily. However, the benefits of that component do not accrue to the cooperatives because animals available for sale are sold at a price fixed by Government about 50% of the market price. The herd consists mainly of Ndama and few of them can be adequately trained for traction because of their small size.

4.23 Afforestation. 1000 ha of cassa and teak have been planted in 1972 and 1973 in line with appraisal targets. The plantations attached to each cooperative have not all been properly maintained and some of them have suffered from bush fire at their early stage of development. However, they have generally developed satisfactorily. No indication are available on the future number of poles made available to the cooperatives.

4.24 Oil Mill. The oil mill contract was awarded to de Wecker (Luxemburg), the lowest bidder in 1971 after an international bidding. Other bidders were SPEICHIM and VOYER (France). The construction of the mill started in 1972 and was completed in 1974 as scheduled. However, processing commenced only in mid 1975 because of delays in installing a tubewell, the inadequacy of water supply (about 10m3/hour instead of 20m3 envisaged) and the procurement of pumping equipment. Total investment cost amounts to CFAF 962,4 million (US$3.9 million) as anticipated in 1971 when the project was evaluated (detail at Annex 2)

4.25 The functioning of the oil mill is satisfactory but is has had difficulties because of several factors: first, peak production is higher and more concentrated than anticipated at appraisal,and, as a result, the mill was heavily congested in the peak season of 1976 and 1977; second the mill cannot handle the high proportion of kernel (about 6-7% of ffb, instead of 4-5%) anticipated for which it was not designed (possibly because of hybrid seeds); and third, oil storage capacity is inadequate and has to be increased. Furthermore, some improvements of the machinery were to be done by WECKER under the guarantee clause of the contract early in 1977.

4.26 The quality of oil is also not satisfactory because of the inadequacy of field organization to collect fruits (see para 4.12). As a result, free fat acid content (ffac) is usually above 7%. While the mill is designed to produce oil with a ffac below 4%. The situation is aggravated by the inadequacy of storage conditions either at the mill or at the harbor, on the other hand, this should not affect prices since most of the oil is marketed domestically or in Nigeria. No data are available on the quantities and price at which oil is sold on the local, Nigerian and other export markets. No data are also available concerning processing, maintenance, transport and storage costs.

4.27 The maintenance of the oil mill is almost adequate although it should be improved and the functionning oil mill is supervised twice a year by an expatriate engineer provided to SONADER by FED under an arrangement related to the AGONVY oil mill. IDA approved the appointment of an oil mill manager as specified in the Credit Agreement. During negotiations in 1971 SONADER agreed to set up a Technical Unit responsible for the maintenance of the three oil mills it was expected to manage. This unit exists but still lacks technical staff and workshop facilities. This becomes a real need now that SONADER also manages the three oil mills formerly under SNAHDA supervision.

4.28 SONADER is now planning to expand the Hinvi oil mill capacity from 20 t per hour to 40 t per hour to cope with expected production in 1979-80. In the meantime, the FED engineer has been able to increase the output of the presses to about 30 t/hour and has designed plans to immediately increase kernel crushing potential (from 1 t to 1.5 t/hour).Altogether, additional investment required at Hinvi is estimated at CFAF 900 million (US$4 million) in 1976 prices and could alone justify the financing of a second project provided that an adequate supply be guaranteed by an improvement of collect organization (para 4.12)

B. Institutions

4.29 The main Beninese institutions involved in the project were SONADER and SNAHDA*. The support given by the Bank to SONADER appears to have been well-justified and successful. Essentially SONADER was responsible for promoting production, while SNAHDA was responsible for processing and sale of palm oil and palm kernel oil. However, because of misgivings about SNAHDA's capacity to construct and manage the mill required to process project output, it was agreed that SONADER should do this also. It may be argued that from the point of view of institution building, it would have been preferable to have retained SNAHDA and attempted to improve its performance. However, given that the project mill was only one of several operated by SNAHDA, it is unlikely that the Bank could have exerted enough leverage to have made an appreciable improvement in SNAHDA's efficiency. The choice taken was probably the correct one.

4.30 A crisis in SONADER's affairs came to a head in 1973. At that time it was trying to carry the burden of a much enlarged responsibility for rural development, as well as a rapidly accelerating oil palm development program, aggravated problems caused by a very adverse cash-flow and financial resource situation. These factors together meant that the standard of management of the oil palm plantations was slipping (aggravated by the adverse weather), control and guidance of the cooperatives was lax, and SONADER's own financial policy and control was poor.

4.31 There is little doubt that the intervention of the Bank and FAC at that time succeeded in restoring the situation and enabled SONADER to retrieve itself. Essentially that intervention provided for the injection of more funds into the project (US$600.000 from the Bank, and US$520,000 from FAC) and for an administrative reorganisation intented to bring about tighter field control of the plantation operations, and better guidance for the cooperatives. It appears that by and large these actions achieved their purpose, though, as has been mentioned before the problem of ensuring SONADER's financial policy and control does not even now seem to have been fully solved.

4.32 Two more points may be made to demonstrate the basic soundness and viability of SONADER as an institution. One concerns the volume and adequacy of the reports provided by SONADER. These have consistently improved in both quantity and quality once the project started and provide a mass of data concerning all aspects of its operation. The other concerns the introduction of animal-drawn equipment. The fact that when the annual crop programme as originally conceived was obviously failing, SONADER attempted a new approach with FAC assistance, clearly demonstrates its flexibility and willingness to learn from experience.

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* Note: These were changed at various times, and SONADER is now called SOBEPALH, and SNAHDA is called CONICOG. However, their functions have not substantially changed and the same names have been retained here for convenience.

C. Cooperative and Social Aspects

4.33 Over this part of the project there still hangs a large question mark. Obviously in the early years of the project, the farmers who were members of a cooperative did not perceive themselves as owners of the oil-palm plantations, responsible for their success or failure. Rather the plantations were regarded as places where remuneration was very low in relation to work done, and farmers only sought employment there if no other was available. This still seems to be the situation, so that there is competition between work on the plantations and work on farmers' own fields. This competition is particularly important during the rainy season.

4.34 Thus although an operating framework of cooperatives has been set up, it is difficult to conclude that it has really taken root. Perhaps this will change with the spreading use of animal-drawn implements, in the introduction of which the cooperatives have a real part to play, as also in the distribution of inputs for improved agricultural practices. However, as regards the social aspects, there seems little doubt that the project has had a substantial impact on the farmers concerned. In an agricultural area where natural conditions (climate, soils) are marginal and potential productivity is low, nevertheless a new technology has been introduced and farmers can be seen to be adopting better practices than in other parts of the country. This must be counted as a major achievement.

4.35 Furthermore the provision of roads and village sites by the project will permit farmers to benefit not only from higher incomes but also from a better quality of life.

4.36 Financing of cooperatives. Projected cash flows for cooperation are not satisfactory, even if the expected yield of 7 tons of ffb per ha is reached. First, cooperatives are heavily indebted; and second, SONADER (and government) are not keen to increase the price for ffb paid to cooperatives. Current price of CFAF 5 per kilo of ffb is much below the price paid in Ivory Coast (CFAF 9) (where interests are subsidised). However, in present circumstances, it is unlikely that Government would agree to change its policy because of the competition between wild and selected palms, the former being transported and processed at a higher cost. In these circumstances, cooperatives would never be able to repay their debts as provided for in the Credit Agreement. Under present price arrangement, the financial rate of return of the investment is minus 0.45 over 25 years, but it could be raised to 4.7% assuming an ffb price of CFAF 7 Frs per kilo (+40%) that SONADER can reasonably afford to pay given the present and future trend for oil palm products. Government has been asked several times and this was a condition of renegotiations of the credit in 1971 to make proposal satisfactory to IDA to resolve this issue. No answer has been obtained yet.

V. ECONOMIC RESULTS

5.01 The rate of return on the project has been re-calculted as follows:

In the cost stream:

a) labor costs through 1976 for oil palm plantations and palm oil mills are included at cost whether or not provided by cooperative members, and thereafter are costed at a minimum of CFAF 125/day (US$0.5) until 1975 and CFAF 200 (US$0.8) to better reflect the

opportunity cost of such labor;

b) no further costs are attributed to the annual crop production component of the project post 1975 other than recurring costs for the seed and other inputs employed and the replacement of oxen and equipment, on the grounds that current levels of production can be maintained for at least 10 years without further investment in either infrastructure or extension and other farmer support services.

In the benefit stream:

c) no deduction is made for palm oil and kernel production forgone from wild palms on land now occupied by the project on the grounds that the net benefit would be small and difficult to quantify and in the calculation compensated for by attributing a uniformity round-the-year value to field labor of CFAF 125/day (US$0.5) through 1975 and CFAF 200/day (US$0.8) thereafter; and

d) assuming annual crop production will stabilize at 1975 levels on the 1500 ha actually cropped under SONADER supervision, and treating as benefits from the annual crop program the difference between actual production and estimated production under traditional hand cultivation practices. Thus, it is assumed that farmers cultivating by hand obtain an increment in yield of 25% through project participation and these using ox-drawn cultivation substantially more.

In addition, costs and benefits of the afforestation and livestock components of the project are removed from both streams. The grounds for this are that: (a) experience shows the livestock program must be treated as an experiment and the probably substantial benefits from the afforestation program cannot yet be quantified; and (b) the impact of these components on the overall rate of return is negligible.

5.02 An economic rate of return of about 12% over a life of 25 years was estimated at appraisal. In the calculation the cost of labor provided by cooperative members in both investment and operating phases was estimated at zero. Furthermore a deduction was made from the benefit stream to allow for th estimated value of that production sold for cash that would have been produced on land occupied by the project were not implemented. The merits of this technique are a matter for conjecture, particularly as the success of ox-drawn cultivation demonstrates a labor bottleneck for much of the year, and in practice considerable recourse was made to hired labor from outside the project area for work on the plantation. Consequently, given the major changes that have occured since appraisal, including the delayed entry into production of the palms, the expected low oil palm yields, the sharp rises in the value of outputs, and the failure of the original plans for annual crop development, the calculation of a revised rate of return on the same basis for comparative purposes would not appear appropriate in light of the present circumstances.

5.03 In calculating the economic rate of return, the timing of investment costs was as follows:

	Up to 1969	1970	971	1972	1973	1974	1975	Total
actual:	448.9	181.2	196.6	403.4	707.5	175.8	112.8	2,226.2
constant 1976 terms:	982.3	370.5	378.8	714.0	1056.0	214.4	117.6	

5.04 As regards benefits from palm-oil, timing should be based on the assumption that each plantation will begin production five years after planting and yields will follow the progression as follows:

	Year 5	6	7	8	9	10	11
ffb ton/ha	0.5	1.5	3.0	4.0	6.0	7.0	7.0

5.05 Yields of palm-oil are put at 21% and of palm kernels at 5% at full production.

5.06 Price of palm oil and palm kernels are taken to be CIF US$578 and US$ 240 respectively in 1980, equivalent to CFAF 13,400 per ton of ffb, in 1976 prices. These prices are in line with the commodity price forecast.

5.07 There is no reliable data in Benin to calculate the economic benefits of the annual crop component; therefore the calculation has been done on the basis of farmgate prices recently estimated in neighboring countries.

5.08 The rate of return is sentitive only to oil palm yields variation since the benefits of the annual crop components are small. Given the uncertainties concerning the estimates of oil palm production, the rate of return has also be calculated with lower yields and would be 2.5% with an average yield of 6 t/ha and zero % with yield at 5 t/ha. Difference with appraisal estimates results primarily from the high benefits anticipated from the annual crop development, benefits which have not yet fully materialized, although clear indications show that the potential for further development still exists.

VI. CONCLUSION

6.01 IDA Performance. The project has been closely supervised since its beginning. IDA has demonstrated its flexibility to cope with the problems encountered:

a) in 1971, the project has been amended to insure the adequate financing of the Hinvi Oil Mill;
b) in 1973, additional financing was also provided to compensate for losses due to exchange rate variations.

Supervision missions have been generally more concerned with SONADER finance than with cooperative finance because they considered that SONADER was essential to project success and that no solution to cooperative problems could be found with low yields estimated in 1973-1975 when the effects of draughts were at their maximum. However, we now have enough evidence that the production would be close to appraisal estimates, and therefore, cooperative financial problems can be resolved through an increase of the price of ffb.

6.02 Future of the project. The project now faces two major issues concerning the organization and cooperative finances. As originally conceived, the project was intended to integrate oil palm and annual crops within a cooperative framework expected to become autonomous with the support of a single agency SONADER. Now Government has decided that the "CARDER de l'Atlantique" would be responsible for the extension work and that SONADER (now called SOBEPALH) would manage the collection of palm fruits, thus making two different agencies intervening in the same project area; thus giving up the integration concept. These new arrangements would certainly aggravate the difficulties already met by SONADER to properly organize the collection of fruits as discussed at para 4.02. Furthermore, Government is studying the possibility to take over from cooperative the oil palm plantations which would be maintained and harvested by SOBEPALH with hired labor. The second issue results from the fact that cooperatives do not receive an adequate share of the value of oil palm plantations. With a price of CFAF 5 per kg of ffb (37% of net revenue), they cannot either pay more than CFAF 200 (US$0.8) per manday to cooperators, nor repay their debts. Thus the important concept of autonomous cooperative is jeopardized. Government is aware of those problems and has temporary maintained SOBEPALH responsible for cooperative supervision in the project area. Further discussion with Government on these important issues is still possible because SOBEPALH is looking for external financing to increase the output of the Hinvi oil mill. IDA has, in principle, agreed to examine a new Hinvi project which would finance the Hinvi oil mill extension together with the development of ox-drawn cultivation. This would be discussed again with Government during the forthcoming negotiations of the Technical Assistance project scheduled in March/April 1977.

BENIN

ANNEX I
Table 1

HINVI PROJECT

Cooperative Cash Flow (600 ha)
1976 Terms
(CFAF'000)

	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 11	PY 1
INFLOWS												
Development Loan	102400	12700	9000	9000								
Short term advances			3150	990	990							
Sales of ffb 1/					1500	4500	9000	12000	18000	21000	21000	210
Total Inflow	102400	12700	12150	9990	2490	4500	9000	12000	18000	21000	21000	210
OUTFLOWS												
Plantation Development	79800	9000	9000	990								
Additional land clearing		3150	3150	990	990							
Maintenance (tools, fertilizers)				3420	3420	3420	3420	3420	3420	3420	3420	342
Maintenance (labor) 2/				3360	2880	2400	2400	2400	2400	2400	2400	240
Harvesting (Labor) 3/				180	540	1080	1440	2160	2520	2520	2520	242
Coop overheads				3060	3060	3060	3060	3060	3060	3060	3060	206
Rent				540	540	540	540	980	980	980	980	98
Annual crops	19700											
Livestock		3700										
Forest	2900											
Total Outflow (before debt services)	102400	12700	12150	9990	11550	10440	10500	10860	11960	12380	12380	1238
(deficit) surplus					(9060)	(5940)	(1500)	1140	6040	8620	8620	862
Manday worked					17700	17100	17400	19200	22800	24600	24600	2460

1/ maximum yield: 7t/ha
2/ CFAF 250 per manday

BENIN

HINVI AGRICULTURAL PROJECT

EXPOST EVALUATION OF THE ECONOMIC RATE OF RETURN
(in 1976 constant terms)

	68/69	70	71	72	73	74	75	76	77	78	79	80
Gross Value of Incremental Production												
ffb (13 frs)					4.8	56.3	85.2	216.8	332.3	403.9	521.5	552.5
Maize (25)							37.1	37.1	37.1	37.1	37.1	37.1
Groundnut							7.1	7.1	7.1	7.1	7.1	7.1
Cowpeas							0.6	0.6	0.6	0.6	0.6	0.6
Cotton							0.9	0.9	0.9	0.9	0.9	0.9
Tech./Cassia												
Cattle												
Subtotal					4.8	56.3	130.9	262.5	378.0	449.6	537.2	598.2
Project Cost	448.9	181.2	196.6	403.4	705.5	175.8	112.8					
Equipment Renewal										40	40	40
Plantation Maintenance					10.8	21.6	36	36	36	36	36	36
Annual Crop Maintenance							17.4	17.4	17.4	17.4	17.4	17.4
Labor Cost						10.6	21.0	34.8	38.4	42	45.6	49.2
Cooperative Management						9.2	18.4	30.6	30.6	30.6	30.6	30.6
Subtotal (current term)	448.9	181.2	196.6	403.4	716.3	217.2	205.6	118.8	122.4	166.0	169.6	173.2
In current 1976 terms	982.3	370.5	378.8	714.0	1069.1	264.9	214.4	118.8	122.4	166.0	169.6	173.2

ANNEX I
Table 3

BENIN

HINVI PROJECT

HINVI OIL MILL: INVESTMENT COST

(CFAF Million)

	1971	1972	1973	1974	1975	Total
OIL MILL COMPLEX						
Oil mill (including civil works)		194.2	479.9	71.5		745.6
Access roads		1.6				1.6
Auxiliary buildings			15.5			15.5
Water and Electricity network			1.3	5.3		6.6
Tools					11.8	11.8
Office Equipment			0.3		0.6	0.9
Telephone Lines			8.5			8.5
Tubewell		21.6				21.6
Pumps				9.8	0.2	10.0
Water Tower			33.5			33.5
Technical Assistance	1.9	1.6	0.8	0.5	3.3	8.1
Subtotal Oil mill	1.9	219.0	539.8	87.1	15.9	863.7
VILLAGE						
Housing		10.2	4.7		1.2	16.1
Water supply			13.1	1.1		14.2
Electricity line			10.3	12.0		22.3
Subtotal Housing		10.2	28.1	13.1	1.2	52.6
TRANSPORTATION EQUIPMENT						
Fork Cart		3.9				3.9
Vehicles		0.7				0.7
Tip Trucks		11.8				11.8
Tank Truck				11.7		11.7
Tractors and Trailers				13.5	5.8	19.3
Subtotal Vehicles		16.4		25.2	5.8	47.4
TOTAL	1.9	245.6	567.9	125.4	22.9	963.7

BENIN

HINVI PROJECT

Table Rainfall in Grand Hinvi Project Area by 3-Monthly Periods, Showing Crop-Year Figures for each Cooperative Plantation.

	Sedje	Koundokpoe	Dodji Cbeto	Agbotagon	Attogon Dessa	Zegoulo	Adjan	Hanafin	Dodji-Sehe	Kpoe-Kpannon	Annual Average
1969.3	225.7	211.5	153.9	258.2	142.6	170.1	222.2	169.1	200.8	156.3	10 Cooperatives
.4	234.9	295.2	189.9	173.2	272.2	220.1	289.6	275.3	210.6	207.1	
1970.1	108.1	127.1	127.1	134.5	164.4	94.7	95.3	198.2	104.5	139.1	
70.2	528.9	503.5	386.9	699.7	495.5	507.1	478.2	649.3	442.5	464.2	
	1,097.6	1,137.3	857.8	1,265.6	1,074.7	992.0	1,085.3	1,291.9	958.4	965.7	1,071.6
1970.3	93.1	157.3	126.1	151.3	117.5	144.4	153.1	106.0	136.3	139.1	
4	325.7	212.4	320.1	285.3	186.8	302.2	238.2	267.7	265.5	237.9	
1971.1	95.9	156.9	179.5	183.2	188.5	168.9	175.4	258.3	103.3	114.6	
1971.2	458.6	442.1	308.9	297.3	295.7	417.7	348.7	439.5	200.4	271.3	
	973.3	966.7	934.6	917.1	788.5	1,033.2	915.4	1,071.5	795.5	762.9	916.1
1971.3	172.5	246.7	204.9	268.9	149.4	248.0	203.9	246.0	250.9	246.4	
.4	40.1	96.6	94.9	87.4	120.7	72.9	46.8	149.1	132.1	39.9	
72.1	141.6	166.1	260.0	216.5	223.9	182.6	189.9	116.9	258.7	146.6	
2	510.3	541.5	506.7	728.9	513.3	515.9	509.5	647.8	536.3	552.9	
	864.5	1,050.9	1,066.5	1,301.7	1,007.3	1,019.4	950.1	1,159.8	1,178.0	985.8	554.0
1972.3	203.8	182.2	143.4	234.8	138.8	234.0	175.6	231.9	128.5	148.6	
.4	74.5	151.3	105.6	102.9	53.7	74.9	94.2	108.2	81.4	122.4	
73.1	42.1	97.9	80.0	56.1	54.4	71.9	93.1	70.7	103.7	96.9	
.2	270.4	277.4	270.5	400.0	224.4	506.3	217.4	328.1	223.7	284.2	
	595.9	708.8	599.5	793.8	471.3	887.1	580.3	738.9	537.3	652.1	656.5
1973.3	429.8	340.5	292.0	375.7	288.6	518.3	453.4	342.2	340.7	281.5	
.4	95.8	236.7	164.4	250.5	133.7	146.1	89.3	209.7	256.9	132.8	
74.1	91.7	114.9	143.3	120.1	125.5	90.6	102.4	96.6	145.5	181.3	
.2	386.9	444.7	462.9	537.0	473.9	468.2	515.3	517.4	476.9	442.9	
	1,004.2	1,136.8	1,062.6	1,383.3	1,071.7	1,223.2	1,074.3	1,165.9	1,220.0	1,037.9	1,028.4
1974.3	290.4	408.1	325.5	325.6	299.0	335.2	356.3	432.0	325.5	432.0	
.4	61.4	163.9	189.0	198.2	165.4	85.2	90.4	115.8	127.5	247.9	
75.1	58.5	154.8	93.0	173.2	51.7	152.0	133.3	151.6	84.0	96.6	
.2	407.0	567.4	572.1	643.9	462.6	522.8	525.2	575.8	533.5	529.2	
	817.3	1,294.6	1,189.6	1,340.9	1,078.7*	1,145.2*	1,109.8	1,272.9*	1,179.0	1,253.5*	1,168.1
10-Year Average:	892.1	1,047.9	951.8	1,167.1	915.4	1,050.0	952.5	1,116.8	795.0	943.0	983.2

Note: These figures are taken from SONADER 1/4 by reports except for the 3rd and 4th 1/4s of 1974, which are taken from Bogaerts tables. The[illegible] are reasonably consistent with the annual total given by SONADE[illegible] except where marked by asterisk.

BENIN

ANNEX I
Table 5

HINVI PROJECT

Table Yields of Fresh Fruit Bunches, Tons/ha

	64/5	65/6	66/7	67/8	68/9	69/70	70/1	71/2	72/3	73/4	74/5	75/6
Hinvi	Planted								3.0	4.5	4.5	
Ovagbo		Planted							2.4	4.5	4.2	
Agon			Planted							2.6	6.1	
Assa-Gota			Planted							2.3	5.0	
Agbotagon				Planted						1.9	2.6	
Attogon				Planted						0.7	2.5	
Goulo				Planted						2.3	1.9	
Koundokpoe					Planted					0.2	1.9	
Sedje					Planted						1.1	
Dodji					Planted						0.6	
Sehe						Planted						
Hanafin						Planted						
Adjan						Planted						
Kpoe						Planted						

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THE WORLD BANK

Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

(Credit 144-DA)

December 2, 1977

Operations Evaluation Department

Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

(Credit 144-DA)

Table of Contents

BASIC DATA SHEET

BENIN - HINVI AGRICULTURAL PROJECT Credit 144-DA

A. Amounts

	Original	Disbursed	As of June 30, 1977 Repaid	Outstanding
Credit 144-DA	4.6	4.6	-	4.6
Credit 144-2DA	0.6	0.575	-	0.575
Total	5.2	5.175	-	5.175

B. Project Data

	Original Data	Revisions June 1974	Revisions March 1974	Actual
First Mention in Bank Files				
" " " Government Files				2/15/65
Appraisal Mission				1/15/67
Board Approval				2/18/69
Credit Agreement			3/22/74	3/ 5/69
Credit Effectiveness	6/ 5/69		6/20/74	8/ 5/69
Physical Completion	6/30/77			12/31/75
Credit Closing	6/30/76			6/11/76
Total Costs	9.6	10.6	9.59	9.1
Economic Rate of Return	12%			5%

C. Mission Data

	Month, Year	No. of days	No. of persons	No. of weeks	Date of Report
Prepreparation					4/65
Preparation	11-12/66				6/ 1/67
Pre-appraisal	3/67	6	4		
Appraisal	7/67		3		
Reappraisal	8/68		2		2/ 3/69
Supervision I	4/69		1	1	6/26/69
Supervision II	8/69	10	3	5	Missing
Supervision III	3/70	11	3	5	5/18/70
Supervision IV	8/70	14	1	2	9/30/70
Supervision V	2/71	10	2	3	4/20/71
Supervision VI	6/71	12	3	6	6/28/71
Supervision VII	1/72	11	1	2	4/ 7/72
Supervision VIII	10/72	11	2	4	11/21/72
Supervision IX	6/73	3	1	1	6/27/73
Supervision X	9/73	5	2	2	11/28/73
Supervision XI	5/76	7	1	1	6/ 5/74
Supervision XII	2/75	11	2	3	2/27/75
Total				35	

No follow-up project.

D. Exchange Rates

US$1 = CFAF 247 (1969)
277 (August 1969)
256 (April 1972)
215 (November 1973)

Project Performance Audit Report

BENIN - HINVI AGRICULTURAL PROJECT

(Credit 144-DA)

I. SUMMARY OF THE PROJECT COMPLETION REPORT

Background

1. The possibility of Bank involvement in oil palm development in Benin was raised by an FAO/IBRD CP mission in April 1965. European financial aid agencies were also interested but reluctant to carry the full burden of external financing. In 1966 the Bank helped the Societe Nationale de Developpement Rural (SONADER),[1/] a parastatal run completely by Africans, to prepare the proposal. Three Bank missions in 1967 and 1968 reviewed the project and the Credit Agreement became effective in August 1969.

2. The constraints on the agricultural components of the project, located in the Grand Hinvi area about 70 km north of Cotonou, were recognized from the start:

(i) marginal climatic conditions for the proposed ten 600-ha oil palm blocks, making it likely that yields would be 50% below those in the most favorable regions of West Africa, and

(ii) low yields also likely on individual plots in the proposed ten 600-ha annual crop blocks, but nevertheless competition between cultivation activities on these plots and maintenance of the cooperative plantations.

In spite of these drawbacks, the pre-appraisal report concluded that the project was justified because there were no investment opportunities then offering better prospects in the agriculture sector of the country.

1/ SONADER is now called SOBEPALH but its functions have not undergone any significant change.

3. The appraisal report did not differ substantially from the pre-appraisal report. It described SONADER as having a high level of competence and possessing considerable experience in the organization of cooperatives. It repeated the misgivings regarding the area's suitability for oil palm. But it gave less weight to the constraints on annual crop production; in fact income from these crops was a significant element in the total incremental income forecast in the report and contributed appreciably to the project's favorable rate of economic return (12%).

The Project

4. The project consisted mainly of: (i) planting and bringing to maturity 6,000 ha of oil palms; (ii) preparing 6,000 ha for annual crop production; and (iii) constructing an oil mill with an ultimate annual capacity of 70,000 tons of ffb. The project also comprised components for forestry, livestock, maize storage, roads and administrative facilities.

5. The participants were to be organized into ten producer cooperatives - each with 600 ha of oil palm and 600 ha of annual crops (the latter block sub-divided in 1.5 ha individual plots). For the first 25 years SONADER was to promote and direct the activities of the cooperatives. Subsequently, the cooperatives were to become lessees of the land and owners of the improvements brought by the project.

6. The main objective was to develop an efficient system of agricultural production capable of replacing the "shifting cultivation" system and raising the farmers' living standards. The project was to make it possible for Benin to maintain, or even increase, its palm oil exports. The annual value of the incremental production was estimated at US$1.3 million in 1975 and US$2.4 million in 1980 (1969 prices).

7. The cost of the project was estimated at US$9.6 million (or CFAF 2.37 billion), of which IDA was to finance 47.9% (i.e. US$4.6 million), FAC (Fonds d'Aide a la Cooperation, the French bilateral aid fund) 47.9% and the Benin Government 4.2%.

8. The physical implementation of the project was to be executed directly by SONADER. For the 25-year life of the project, SONADER was to manage on behalf of the cooperatives the oil palm plantations, the annual crop blocks and all the productive components of the project except for the oil mill, which would be SONADER property. SONADER was thus to play two distinct roles: (i) that of a development agency, and (ii) that of a managing agent for the cooperatives.

9. Farmer participation in the project was not entirely voluntary, since SONADER was legally empowered to oblige landowners in the project areas to join producer cooperatives and to rent their land to these cooperatives. The farmers could become members of the cooperatives by leasing their land to them ("A" share members), by working on the oil palm plantations ("B" share members), or both. The novel feature of this cooperative system was the formation of producer cooperatives with two categories of members, where it was intended that only the "B" share members were entitled to a voice in the running of the cooperative. In the event of a surplus, they were to receive interest of 3% on their shares in the profits of the cooperative.

Implementation

10. Oil Palm Plantations. The planting program got off to a good start and was completed in accordance with the forecasts. Altogether 6,075 ha of oil palms were correctly planted and reasonably well maintained, despite difficulties in obtaining the labor needed for these operations.

11. Annual Crop Areas. The annual crop program soon ran into difficulties. Fewer farmers than expected were prepared to abandon traditional shifting cultivation on plots cleared in the forest and take up 1.5 ha holdings in the project blocks. On these 600 ha blocks, called ZOCA's, input use was minimal and yields far below appraised targets. By 1971, only 450 farmers had taken up plots in the ZOCAs. In 1971-72, a greater flexibility permitted to the farmers by SONADER for choosing the crop rotation, and the introduction of animal traction, stimulated more farmer interest. Thanks to technical assistance financed by FAC, the use of animal traction increased rapidly. But constraints on the supply of animals are believed to limit expansion of ox-drawn cultivation and further development of the ZOCAs remains uncertain.

12. Oil Mill. The original project called for a mill of 24 t/h capacity to be built in two stages. The revised project (April 1971) showed the need for a 20 t/h mill, with provision for expansion to 40 t/h. Construction of the mill was completed in 1974 as planned, but it did not go into operation until mid-1975 owing to water-supply problems. The total investment cost was CFAF 962.4 million (US$3.9 million), as estimated in 1971. The functioning of the mill is satisfactory on the whole, especially since some last adjustments in 1977 which made it possible to raise capacity to 27 t/h.

13. Costs and Financing. The project costs and financing schedule was revised twice. In 1971, with the difficulties encountered on the ZOCAs and a need to reallocate oil palm production among existing and planned mills, project costs were restructured. The Bank then abandoned its support to the ZOCAs, which SONADER pursued thereafter with FAC technical assistance, and the funds thus released helped finance the extra costs of the mill. Total project costs were increased by 26% to CFAF 3.02 billion.

14. In 1973 SONADER faced a financial crisis, caused by successive dollar devaluations and non-payment of the government contribution, and aggrevated by the agency's failure to establish financial planning and control systems. To solve these problems, IDA provided a supplemental credit of US$600,000 in January 1974 and FAC contributed an additional US$520,000 to the project.

15. In the end, total project expenditures were lower than estimated (CFAF 2,266.6 million). IDA financing was increased, however, from US$4.6 million to US$5.2 million, thus accounting for just over 54% of the total bill. FAC's contribution amounted to 43% and the Government's to 3%.

16. These costs were determined from the disbursement records kept by SONADER. For certain types of expenditures, the weakness of SONADER's accounting procedures means that actual costs cannot be stated with certainty. However, the accounting system is now being improved. It must be recognized that disbursements and procurement were particularly complicated in this project owing to the sharing of payments between FAC and the Bank.

Impact of Project

17. Plantation Yield and Production. Despite the excellent performance in planting, and satisfactory maintenance, production has been very much below estimates. The principal reason is low rainfall. In most of the cooperatives, rainfall for two years (1971-72 and 1972-73) was less than the minima recorded over the previous 30-year period and distributed very unevenly over neighboring cooperatives. Production was also affected by fires, spreading from where farmers were burning their fields, and theft, due to the inadequate organization of ffb collection and the higher prices obtainable on the parallel market.

18. Annual Crops. With the introduction of animal traction, the total number of farmers in the ZOCAs rose from approximately 1,800 in 1973 to 3,000 in 1975, and those using ox-drawn equipment from 352 to 880. Maize yields are double those obtained with hand cultivation; cotton yields, however, remain marginal.

19. Oil Mill. The functioning of the mill is satisfactory, although a certain number of difficulties still persist (peak production higher and more concentrated than anticipated, high proportion of kernel, insufficient oil storage capacity). The free fat acid content is much too high (over 7% as against a target of 4%), due to inadequate organization of fruit collection and the insufficiency of storage capacity. SONADER plans to raise the capacity from 27 t/h to 40 t/h, which will entail an additional cost of CFAF 900 million (US$4 million at 1976 prices).

20. SONADER. The assistance from the Bank and FAC helped SONADER pass through its financial crisis in 1973. Essentially this assistance provided for the injection of more funds and for an administrative reorganization designed to bring about tighter control of the plantation operations and more effective guidance for the cooperatives.

21. Cooperatives. The cooperatives had a hard time getting going, mainly because of initial opposition from the landowners. The working members did not perceive themselves as owners of the oil-palm plantations, responsible for their success or failure, and they considered remuneration from the plantations as being too low in relation to work done. At the recoverable price of CFAF 5/kg ffb,[1/] the estimated cash flows of the cooperatives are not

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1/ This price has been raised since the time of the PCR (para. 44).

satisfactory. In these circumstances, the cooperatives would never be able to pay their debts as provided for in the Credit Agreement. The Government has been asked several times to raise the price, but no decision has yet been taken.

22. Rate of Return. To recalculate the economic rate of return, the wage is set by the PCR to reflect the labor constraints in the area, no deduction was made for the oil and kernel production foregone from wild palms on project land, and annual crop production was expected to stabilize at the 1975 level on the 1,500 ha presently cropped. Under various assumptions of future oil palm yields, the economic rate of return is estimated at less than 5%.

Concluding Remarks

23. The project has been closely supervised since its beginning and IDA demonstrated its flexibility in 1971 and 1973 in coping with the problems encountered. However, the outcome of the project now depends on two emerging problems concerning organization and the financing of the cooperatives. The first was precipitated by Government's decision to entrust all extension work in the country to a newly formed organization; SONADER would henceforth only manage fruit collection and processing. If carried out it would mean abandoning the concept of integration of the different project functions in one single organization and SONADER's supervision of the cooperatives. The second problem results from the small share (37% of net revenue) of the income of the oil-palm plantations received by the cooperatives. The low share jeopardizes their autonomy. Government appears to be aware of the probable consequences of these matters.

II. OED COMMENTS

Institutional Aspects

24. SONADER. One of the unusual features of the project is that it was prepared and executed by a Beninese corporation with very little technical assistance. SONADER assembled the technical, social, and economic data, and prepared the whole of the Government's application. The agency's management has been sound, both for this project and for activities in other regions covering similarly ambitious programs. Besides incorporating into its activities a number of new activities called for at appraisal, such as stock-raising, forestry plantations, and palm oil processing, SONADER succeeded also in introducing animal traction to improve the situation in the ZOCAs, a component not discussed in the planning period. SONADER also innovated by establishing a women's section in the field service, partly to ensure support from female workers (para. 42). Such weaknesses that drew the attention of supervision, particularly in accounting, were or are being corrected and no longer seem to seriously affect agency operations. To sum up, despite its deficiencies, SONADER is remarkably effective, and this is recognized not only by the Government but also by the commercial banks.

26. The chief reasons for this success are: (i) SONADER has always been able, because of its good reputation, because of a salary structure which remunerates its officers for their good performance, and because of its favorable southern locations (not far from the major urban centers),to attract competent staff and thus to set up an efficient management team; (ii) SONADER has operating autonomy and executes its development programs according to business criteria; (iii) however, this autonomy does not make SONADER into a "foreign body", since it remains

first and foremost an executing agency for Government policy, well integrated into the national institutional setting; and (iv) SONADER was able to effectively coordinate its different fields of activity, because they were integrated under a single authority.

27. OED was impressed by SONADER's ability to analyze its problems and act accordingly. The introduction of ox-drawn cultivation and the creation of a female workers' section exemplify this ability. It is noteworthy that SONADER has responded to its experience without having instituted a formal monitoring and evaluation function. SONADER delegates authority to its different sections and the cooperatives.[1/]

28. SONADER's experience raises the question as to whether the Bank should not seek more often to have projects managed by national staff. On the one hand, the project had characteristics which are usually thought of as requiring expatriate management, numerous components involving a complex task of coordination, and components such as the establishment of estate plantations and the operation of major processing facilities, calling for strict administrative discipline. SONADER has demonstrated that even these difficult tasks are within reach of local agencies. Furthermore, local management seems to facilitate both the integration of the project into national programs and the interaction between the project and the intended beneficiaries. These are important advantages over expatriate management for maintaining project

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1/ As the PCR points out, this efficient network for communication and coordination may be lost if the new agencies established recently (CARDER: Centre d'Appui Regional pour le Developpement Rural; SONACEB: Societe Nationale du Commerce Exterieur du Benin; SODERA: Societe de Developpement des Ressources Animales) start performing the functions officially assigned to them. Government confirmed to the audit mission that it is aware of the dangers of subdividing SONADER's activities among the new entities.

achievements once external financial assistance ceases. On the other hand, Benin is known to be exceptionally well endowed with high-caliber personnel. Furthermore, SONADER had accumulated ten years of experience when the project started and was well established as a trustworthy undertaking to which the government was willing to delegate authority to operate efficiently. It is therefore difficult to determine to what extent SONADER's experience is replicable. Even in Benin SONADER's success seems to be exceptional: OED is currently auditing the Benin Zou-Borgou Cotton Project and the performance of the semi-autonomous executing agency for that project (SONACO) has been pretty poor.

29. The Cooperatives. In contrast to experience in most African countries, and despite valid reservations made in the PCR (PCR paras 4.33 through 4.36), project cooperatives seem to be well on the way to becoming efficient farmers organizations, managed to a large degree by the members themselves. This phenomenon can be attributed to the following set of factors:

(a) Legislation, which does not imitate Western concepts but attempts to find original solutions for local conditions. By making a distinction between "A" and "B" members (PCR para. 2.16) for example, this legislation facilitated low-cost land reform by compensating land owners with shares instead of cash while leaving management authority to the workers (only "B" members have voting rights);

(b) Good management support from SONADER, which gives the cooperatives efficient back-up in selecting staff, provides technical assistance and supplies inputs. SONADER management now views its role as a supporting institution to the cooperatives, the reverse of the earlier relationships;

(c) A fair system of remuneration (wages, dividends) which increases payment to farmers as the cooperative develops, thereby starting to satisfy the cooperative member's expectation of increased income in step with project progress;

(d) An efficient system of supervision. The accounts are kept by SONADER, but are subject to a dual-control system, being supervised by (i) an auditor chosen by the cooperative members, usually a trusted civil servant and (ii) a Government auditor from the Ministry of Rural Development;

(e) The granting of effective powers, from the start, to the Board of Directors, which organizes the cooperative's day-to-day operations and pays and supervises the permanent staff of the cooperative; and

(f) A national political context favoring farmer participation in agricultural development organizations.

30. One potential obstacle to the smooth development of the cooperatives has not been mentioned in the PCR; it is the risk of a small minority of "B" share members gaining control of the cooperatives management, at the expense of those who actually contribute most of the work. In one of the cooperatives visited by the audit mission, there were 470 "A" members, 100 "B" members and 300 workers who had not accumulated in four years the 200 days necessary to become "B" members. In another cooperative the composition of the labor force in 1976 was as follows:

4% worked over 200 days per year (semi-permanent workers);

17% worked between 50 and 200 days per year;

37% worked between 10 and 49 days per year;

42% worked less than 10 days per year.

Thus, less than a quarter of the manpower reaches the average 50 mandays per year necessary to acquire a "B" share within four years time. For the 10 cooperatives there are 4,731 "A" members and 1,218 "B" members. These figures

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1/ Two other problems mentioned in the PCR are the planned take-over of the cooperatives by a newly formed Government agency and the low price paid by Government for the cooperatives oil palm products.

compare with the estimate of 3,000 farmers having a plot in the ZOCAs (PCR para. 4.18). There is no indication how that group of 3,000 relates to the "A" and "B" categories, but at most only about 40% of farmers in the ZOCAs have "B" status. Since only "B" members are legally entitled to participate in the management of the cooperatives, this minority group could in theory work against the interests of the broadly based participation on which the principle of the cooperatives was based.

31. So far, the workers who are not "B" members are nevertheless permitted to participate in share holders meetings. They also received dividends in proportion to their work. Thus, the danger of a take-over by the minority "B" members does not seem to be immediate. Nevertheless, the legislation should be amended to take the actual situation into account and allow formal participation of all male and female workers (e.g., through the creation of special shares for instance).

33. In sum, project success is related to the strength of its institutions. At the outset the Bank decided to take part in the project chiefly on the basis of the proper functioning of SONADER. As indicated in the PCR (para. 1.05) the initial confidence was justified. Today, the fact that SONADER and the cooperatives are functioning satisfactorily augurs well for the future of the project. In three other West African projects visited at the same time as this audit (see the Preface), second phase projects were necessary not only to support additional investments, but also to maintain the achievements of the first phase by providing further management assistance to the project executing agency. This is not so in the Hinvi Project. The fact that it has been executed by a sound agency with an entirely local staff makes it

possible to consider proposals of further financing to carry out additional investment programs.

Insufficient Knowledge of Local Conditions

34. Labor. For the plantations, the Bank assumed that family workers in the traditional system were largely underemployed and had limited opportunities for employment outside the project. Thus, the initial scheme envisaged that the cooperatives would benefit from a steady labor force with each member working 50 to 100 days per year once the project was fully under way. This regular supply of labor was expected to be an important factor in ensuring the proper technical functioning of the cooperative and the interest and loyalty of its members.

35. The labor assumptions were over optimistic. A labor shortage appeared starting in the land-clearing stage, and it was necessary to recruit casual labor, sometimes from outside the area. Even now, although the project as a whole is able to obtain the amount of labor required for maintenance and harvesting, its distribution is extremely uneven (para. 30).

36. This situation could have been foreseen. According to a study made in 1973 in the Mono River Valley, where SONADER implements a similar oil palm venture partly financed by FED, the amount of time devoted to agricultural work has traditionally been about 100 days annually per active person. Furnishing to the coops 50 days of additional work was a substantial increment in view of the other economic opportunities and social obligations of the farmers. In fact, it was mainly young people without family responsibilities who worked more than 50 days annually on the plantations. The other farmers worked in the cooperative only when they had no other opportunity for employment. This happened only occasionally, as suggested by the figures in para. 30.

The difficulties encountered at the start of the project with the maintenance of the palm plantations arose chiefly from this lack of labor. That it has not become a major problem is mainly due to the cooperatives' acceptance of irregular workers as full members although the original legislation did not provide for this (para. 31).

37. The Annual Crop Areas (ZOCAs). The new permanent agricultural system developed at a local research center, at that time operated by French technicians, was based on the rotation of crops and intensive farming methods. The system had to be followed rigorously to yield results which would make it superior to the old system of shifting cultivation. Previously, the new system had been introduced without much success; in fact, all of SONADER's earlier experiments with it had foundered. Nonetheless, at appraisal, all agencies concerned believed that the new system was superior to the traditional one of shifting cultivation and felt that the farmers would adopt it.

38. From the outset the proposed system was not popular with the Hinvi farmers, who, as the PCR indicates (para. 4.15), preferred their traditional practices to the intensive project routine. It would appear that the new system did not meet all the needs of the farmers - the part devoted to food crops was too small, the yields obtained from commercial crops (groundnuts, cotton) were low and the planned rotation created serious labor constraints during the planting and harvesting periods. Since the rotation system was rigid and virtually obligatory, it is not surprising that in the early years the farmers stayed away from or abandoned the ZOCAs, preferring to grow their crops outside the project. The Bank, like FAC and SONADER, seems to have seriously overestimated the benefit that the farmers could derive from the

new system. Subject to labor constraints, they did not assess the system in terms of its return per hectare - in which it was unquestionably superior to the traditional system - but rather in terms of its return per day worked - in which its superiority remains uncertain and probably small at best.

39. Later, relaxation of the cropping pattern routine and the introduction of ox-drawn cultivation brought about a radical change. The use of animal traction makes it possible to almost double the yields of the main crops while reducing the mandays needed per hectare at the critical moments of planting and weeding.

40. The PCR correctly notes that expansion of the use of animal traction faces a number of obstacles: the inability to supply oxen adapted to the conditions of the region, and financial limitations which prevent the farmers from acquiring a pair of these draft animals. The cost of a pair of oxen, together with the risks associated with the purchase (mortality of the animals, difficulty with repayments in years of low rainfall) and the additional work involved in looking after the animals, have persuaded the small and medium farmers to rent oxen. The rental system leaves the risk and the outlay - but also the profit - to the large operators. Without financial assistance for small and medium farmers, the introduction of animal traction is leading toward greater social differentiation. Thus, the Bank may have erred when it refused to help SONADER with the ZOCAs precisely at the time a solution seemed to be in sight. In 1971, when the project was reviewed, FAC stepped up its technical assistance to ZOCAs for developing animal traction, while the Bank reduced its contribution to this component of the project.

41. It is evident that the breakthrough brought about by ox-drawn cultivation has been only partial, and that other factors continue to depress planned activity on the ZOCAs. The audit mission found that:

(i) The crop rotation has been virtually abandoned. Maize accounts for about 80% of the ox-drawn cultivated areas and 90% of the hand cultivated areas. This monoculture responds to the greatly improved market for maize, in Benin and Nigeria, but threatens to exhaust the soil;

(ii) Fertilizer consumption remains extremely limited (4.5 tons total in 1976 versus 100 ton forecast at appraisal)and has been falling sharply since the rise in fertilizer prices in 1974;

(iii) The sum of (i) and (ii) result in a critical threat of soil degradation. This is one reason for the limited use (50%) of available area: farmers prefer to leave fallow land which they believe to be partly exhausted, in accordance with their traditional shifting system. Thus, ox-drawn cultivation alone is unlikely to bring about a new agricultural equilibrium as long as the problem of maintaining the fertility of the soil has not been resolved.

42. Role and Attitude of Women in the Project. During the preparation of the project no specific consideration was given to women, even though they were known to play a key role in food crop production, in the processing of wild oil palm fruits and in the marketing of oil and maize. The women have not yet given full support to the project: it has eliminated a good part of their annual income (processing and marketing), a loss which has been offset only in part by the possibility of obtaining paid work in the cooperative. Their participation in the cooperative is still limited: there are very few women "A" or "B" members. Nonetheless, their role has been important, especially

in work requiring meticulous detail (preparation of nurseries and planting of legume cover). In 1973, SONADER recruited female personnel to set up a women's section responsible for a program of home economics and instruction on new cultivation techniques. Some additional measures (participation in cooperative structures, establishment of stores for the supply of staples, etc.) would undoubtedly increase the women's support for the project. That support is essential to its continued success, for the women can undermine the design. They might protest, for instance, by processing more fruit themselves instead of having them delivered to the mill (PCR, para. 4.10).

43. In the early stage of the project, the Bank's lack of attention to the needs of women farmers might be explained by its over-optimism about labor availability, which made the project appear less dependent upon female participation. The emerging labor shortage, however, and the large number of women in the nurseries, should have made the Bank more aware of the special role played by women in a project that had been designed mostly with men in mind. The head of SONADER women's section commented that the audit mission was the first World Bank mission that had asked to meet with her.

Impact of the Government's Price Policy on the Project

44. Despite a recent increase in the produce price for oil palm fruit from CFAF 4.6-4.9/kg to 5.6-5.9/kg, the parallel market is still more attractive to the growers and the problem of fruit theft continues to be a concern to project authorities. The farmers apparently make more money by processing the fruit themselves than by delivering it to the mill. The mill, already operating below capacity, has again cut back its processing volume in 1977.

45. At the current price, the cooperatives can cover their operating costs but an average yield of at least six tons/ha is necessary to allow them to repay their 25-year loans and provide fair remuneration for manpower. At a yield of 5 tons, as obtained during recent years, the cooperatives will not be able to pay back either long-term loans for project investments or short-term borrowings in the form of cash advances granted by SONADER. This is not a deficiency of the cooperatives, which are operating efficiently and could only with difficulty reduce production costs.

46. In view of the budgetary problems faced by the Benin Government, it is understandable that it wishes to keep the producer price as low as possible. Government is allowed thereby to use returns from this project to benefit other less favored areas. However, the funds that the Government would distribute to Hinvi farmers via a producer price increase would be partly returned to it in the form of loan repayments. Likewise, with mills operating below capacity, the fixed costs per unit processed are excessive. They would be reduced, and Government's average earning per ton increased, by an upward adjustment of the producers' price. The latter would be only a temporary outlay, which would be recovered by the Government over the long run. The increase would also strengthen the cooperatives to play a larger developmental role. For all these reasons, it seems urgent to bring the remuneration of the farmers' production into line with market conditions, either by increasing the price itself, or by arranging for the cooperatives to share in the profits of the mill.[1/] OED supports the PCR in its criticism of Government for not giving this matter the consideration it requires.

1/ It was originally planned that the cooperatives would be federated into a cooperatives union which was eventually to take over responsibility for the mill. If this idea is abandoned, the question of distribution of the mill's surplus, after normal repayment of loans, will still have to be settled.

Economic Rate of Return

47. The preappraisal mission assessed project risks and concluded that even if the economic return was marginal at best, the project was justified for other reasons, such as a good institutional base and a lack of other investment opportunities in the agriculture sector in Benin.

48. The appraisal report echoed the warnings of the previous mission, but the quantitative analysis provided a more optimistic report. Production values proposed by these two missions, and those originally suggested by SONADER, are as follows:

Annual Gross Income in Operation	SONADER Estimate (millions CFAF)	Pre-appraisal Estimate (millions CFAF)	Appraisal Estimate (millions CFAF)
Palm oil	486	424	340
Palm kernel	115	65	49
Annual crops	139	46	250
Total	740	535	639

The major role assigned to annual crops in the appraisal design was not found in the earlier proposals. Given the failure of previous SONADER trials with annual crops, appraisal's faith in the successful outcome of this component seems unwarranted. There were, on the contrary, numerous signs that it was over-optimistic. A cynic would have to conclude that by upgrading the annual crop component the Bank was trying to provide to the proposal a stronger economic justification, and this in spite of the fact the Bank knew the the project was justified for reasons other than its economic impact.

49. The ROR estimate, important at the time of project appraisal, seems to have been ignored during project execution. When, following the 1971 SONADER crisis, the Bank revised project costs, it reduced those attributed

to the ZOCAs and increase those to the mill (PCR, para. 3.09). Contrary to the position of FAC, the Bank did not find it appropriate to assist in developing ox-drawn cultivation. At the time, doubts existed about the appropriateness of ox-drawn cultivation as a way to make the ZOCAs more attractive to the farmers and the prospects for livestock and annual crops development remained therefore uncertain. Furthermore, the Bank had limited experience with ox-drawn cultivation. Thus, the Bank was reluctant to support SONADER's initiative. But the main constraint according to Bank staff was financial: the Bank had only US$600,000 available and was committed to finance 100% of the cost of the mill. It therefore withdrew its support to the ZOCAs to meet the full cost of constructing the mill. The Bank was thereby cutting itself adrift from its own appraisal analysis, since annual crops were intended to provide 40% of project earnings (see table above). Abandonment of the ZOCA by the Bank implied that project's ROR would be driven below zero. There is no indication in Bank documents, however, that the decision to reduce efforts in the ZOCAs was taken in association with an anlysis of the impact on the ROR. The ROR was no longer emphasized as a decision-making tool, even when significant changes in project components were being considered. It is most fortunate that FAC continued to promote the development of ox-drawn cultivation, because the annual crop component has been essential in maintaining a positive ROR.

50. Unrealistic assumptions in previous ROR calculations have been corrected in the PCR. Yield estimates take into account possible future poor rainfall conditions, areas cultivated in the ZOCAs have been assumed to remain unchanged (PCR, para/ 5.01), and labor has been costed at close to market price. For the reasons outlined in the preappraisal report (PCR, para. 1.04), the low rate of return is not an indication that the investment should not have been carried out.

III. CONCLUSIONS

51. On the basis of economic returns, the project does not compare favorably with the appraisal forecasts. The new ROR estimate at most reaches 5%, far below the 12% forecast by the appraisal mission. Output has undoubtedly suffered from poor rainfall in the period. Nevertheless, even with palm yields equal to those estimated in the original appraisal, the project would not reach the forecast ROR since the production of annual crops is far below expectations. That result is explained with reasons largely unconnected with climatic conditions and which were foreseeable at the time of appraisal. A more in-depth analysis then of the project setting, and appraisal figures more in line with the uncertainties expressed in the text of the appraisal report, would have led to a more realistic ROR, and the final result would not be disappointing.

52. In any event, the audit mission considers that the economic aspects of this project are of considerably less interest than the institutional aspects. The institutions set up have proven to be efficient and show a great capacity for self-betterment. SONADER is remarkable in that it is entirely managed by nationals who required only a minimum of foreign technical assistance to complete the development program in the alloted time. The cooperatives evidence interesting characteristics and are a rare example of successful deployment of rural community organization in a Bank project. The ability of SONADER and the cooperatives to continue to pursue their development will depend on the support that the Government provides them in the form of continued integration of the activities now embraced by SONADER's single

organization, fair prices for cooperative products, and adaptation of the legislation governing the cooperatives to the new needs which have arisen since their establishment. Nonetheless, SONADER's and the cooperatives' satisfactory performance to date allows a greater confidence in the future of Hinvi than OED holds for the other three projects analyzed simultaneously by OED (see Preface), particularly for the period after the end of Bank assistance, in the absence of second-phase projects.

53. The Bank's review of on-farm conditions was superficial. Benefits that farmers obtained from their traditional cultivation system, and the farmer's perception of those benefits, were under-estimated, and potential benefits from the new annual crops program were over-estimated. The Bank also seriously over-estimated the farmer's availability of labor. The common appraisal assumption in the Bank's smallholder projects, that the opportunity cost of the smallholder family' s labor is zero, holds in none of the four projects visited. Hence farmers' likelihood to participate in the projects should be measured in terms of returns per manday as much or more than returns per hectare. Furthermore, detailed studies of seasonal labor bottlenecks and the role of women and of younger family members who form a major part of the available labor force, appear to be justified at appraisal and during project implementation to determine possible constraints to their full effect on or participation in the project.

BENIN
HINVI AGRICULTURAL PROJECT
CREDIT 144-DA
COMPLETION REPORT

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1 The report refers to SONADER, the agency responsible for project implementation. Since 1976, SONADER has become SOBEPALM (Societe Beninoise de Palmiers a Huile).

I. BACKGROUND, PREPARATION AND APPRAISAL

1.01 The possibility of Bank involvement in oil palm development in Dahomey was discussed by an FAO/IBRD CP mission in a report dated April 1965. This report concluded that the ongoing program of planting 2,500 hectares of oil-palm annually was likely to be financed by FAC and FED at least until 1968, and there was therefore no room for immediate Bank involvement. The CP report did however point out that production from the ongoing program would not meet projected requirements of palm oil for export. During 1966, because of a growing reluctance of FAC and FED to carry the full burden of external financing for the proposed project, the Government requested assistance from the Bank. PMWA then collaborated with SONADER to prepare a project during the latter months of 1966. This was followed by a pre-appraisal mission in March 1967, appraisal in July 1967 and reappraisal in August 1968; the Credit Agreement became effective in August 1969.

1.02 From the beginning it was recognized that the agricultural elements of the project, namely development of oil palm in ten cooperatively owned blocks of about 600 ha each, and development of annual food crops on the holdings of individual cooperator/farmers, would be subject to a number of constraints. For instance, the pre-appraisal report said "conditions for planted (oil) palms are marginal and yields are likely to be 50 percent of those in the most favorable areas of West Africa" (P.A.R. para 2.07 of appraisal report). The incorporation of oil palm plantations with food crop growing and small holdings had also been the subject of a number of negative experiments but it was believed the problem had been overcome (P.A.R. paras 2.10 - 2.12. See footnote).

1.03 As regards the field crops it was feared that the cooperative organisation proposed might mean that the farmer cooperators would neglect either field crops or oil palms, and although it was felt that it had been carefully thought out, "time alone (would) show its effectiveness" (P.A.R. para 3.20).

1.04 In spite of these reservations, the preappraisal report concluded that there were "no other investment opportunities which offer more favorable prospects than this project in the agricultural sector", (P.A.R. para 5.01). If the appraisal mission could satisfy itself that the cooperators could "produce as much from the field crop areas as they could without the project" and that productivity could be increased by the project, the project would probably be judged economically viable (P.A.R. para 5.03). The delay of nineteen months between the first appraisal mission and the issue of the appraisal report is "due to the political instability following the change of government in December 1967 and the precarious financial situation in Benin which prevented FAC and IDA from proceeding with the project until the end of summer 1968." (P-670 5/2/69).

Note: In this paper, References to documents are as follows:

P.A.R. Pre-Appraisal Report dated 1st June 1967, Memorandum from Rowe, Vigie, Bishop and von Czernicki to Evans.

P-670 Report and Recommendation of the President, dated 5th February 1969.

A.R. Appraisal Report. Report on Hinvi Agricultural Development Project, TO-615b, dated 3rd February 1969.

S.M.R. Supervision Mission Report.

1.05 The appraisal report did not differ substantially from the pre-appraisal report in its general assessment of the situation. It confirmed both the misgivings about the suitability of the area for oil palm (A.R. para 3.02) and the judgement about SONADER's capacity to execute the project. "SONADER is completely Africanized and displays a high level of competence, both at its head office and in the field. It is efficient, and has gained considerable experience in agricultural development and the organization and management of producer cooperatives. SONADER is capable of handling an expanded programme including the proposed project. It is of the utmost importance to the continued success of SONADER's operations that the quality of its senior staff is maintained" (A.R. para 6.02). This refreshing and rather rare confidence in the ability of an institution to carry out a development project, was, as will be seen, on the whole, well-justified.

1.06 Unfortunately the appraisal report devotes relatively little attention to the constraints on annual crop production. This had been picked out in the reappraisal report as a key issue; income from annual crops was an important element of the total incremental income and in the favorable economic evaluation of the project. In the event the relatively meagre success of annual crop development almost caused the project to founder during implementation. Thus it is unfortunate that this issue was not given more prominence at the time of appraisal.

II. THE PROJECT

A. Project Description and Objectives

2.01 The Appraisal Report summarises the project and its principal objectives as follows:

- establishing and bringing to maturity 6,000 ha of oil palms;
- preparing 6,000 ha for annual crop production;
- constructing a palm oil factory with an ultimate annual capacity of 70,000 tons of ffb;
- planting 1,000 ha of teak and cassia trees;
- purchasing 310 cattle for the development of beef production;
- constructing maize storage silo with an ultimate capacity of 3,000 tons;
- developing necessary roads and central project facilities.

Development, and subsequent production, was to be organized through ten cooperative units - each with 600 ha of oil palms and 600 ha of annual crops. During the first 25 years of project development and operation, the Societe Nationale de Developpement Rural (SONADER) was to have full responsibility for managing the project, and directing cooperative activity. Subsequently, the ten cooperatives were to become lessees of the land and owners of the improvements described above. SONADER was to train required cooperative staff, and to meet cooperative staffing costs during the development period.

2.02 The main objective of the project was to develop an efficient and modern system of agricultural production, capable of assuring participating farmers of standards of living superior to those obtainable from traditional farming methods. In achieving this, the project was to increase the production, and maintain,

while initially increasing, exports of oil palm produce from Benin.

2.03 Incremental production generated by the project was expected to be as follows: (per year)

	1975	At Maturity (1980)
Palm Oil (Tons)	4,275	10,080
Palm Kernels (Tons)	1,395	2,400
Maize (Tons)	6,535	8,739*
Groundnuts (Tons)	1,582	1,920*
Seed Cotton (Tons)	1,338	1,600
Livestock (Adult Head)	60	62*
Teak (Poles)		70,000 (approx.)

The annual value of incremental production was estimated to amount to US$1.3 million in 1975 and to US$2.4 million in 1980 (at 1969 prices).

B. Project Costs and Financial Arrangements

2.04 Estimates of Project costs are summarized in the following table:

Original Project Cost Estimates

	Local Currency			US$		
	Local Currency	Foreign Exchange	Total Costs	Local Currency	Foreign Exchange	Total Costs
	-------CFAF Million----			-------US$ '000--------		
Studies	8	32	40	32	130	162
Oil Palm Development	708	237	945	2,870	956	3,826
Oil Palm Factory	64	492	556	255	1,992	2,247
Annual Crop Development	165	32	197	668	129	797
Livestock	34	3	37	138	12	150
Afforestation	25	4	29	101	16	117
Staff and Training	36	4	40	146	16	162
Villages, Roads, Vehicles,etc.	75	119	194	304	481	785
Maize Silos	4	36	40	16	146	162
Overheads and Maintenance	80	44	124	324	178	502
Contingencies	84	84	168	340	340	680
Total	1,283	1,087	2,370	5,194	4,396	9,590

2.05 Fonds d'Aide et de Cooperation (FAC) of France participated in financing the project as shown in the following agreed financing plan:

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* The annual production of these commodities was expected to increase slightly in subsequent years up to 385,000 poles in the period 1980-84.

Financing Plan

Source	Foreign Exchange	Local Currency	Total Financing	Percentage
	US$ Million			
IDA	2.8	1.8	4.6	47.9
FAC	1.6	3.0	4.6	47.9
Government of Benin	-	0.4	0.4	4.2
Total	4.4	5.2	9.6	100.0

2.06 As explained in the President's Report and Recommendation, the financing arrangement with FAC meant that "the amount of IDA financing (was) substantially the equivalent of the foreign exchange component of the whole project" (P-670, para 11). The large proportion of external financing was conditioned by the fact that Benin was suffering financial difficulties at that time; was dependent on France for considerable current budget support; and could not be expected to make a large contribution to development expenditures.

2.07 It was proposed that "IDA and FAC financing would be parallel in part, and the remainder joint. All goods and services financed wholly by IDA, valued at $2.7 million, and all goods and services financed jointly by IDA and FAC, valued at $5.8 million, would be procured through international competitive bidding, except for contracts of $50,000 equivalent or less which would be awarded on the basis of local competitive bidding in accordance with procedures acceptable to IDA. Goods and services financed wholly by FAC, valued at $0.7 million, would be procured within the Franc zone in accordance with FAC's normal procurement procedures." (P-670, para 12).

2.08 Internal financing arrangements were that Government would (a) on-lend the IDA credit to SONADER at 6% interest for a term of 25 years including 9 years of grace and (b) onlend the proceeds of the FAC grant to SONADER for a term of 31 years with varying interest rates of 0.75% to 2.5%, repayment to be to Fonds Dahomeyen de Renouvellement de la Palmeraie, a fund established, at FAC insistence, for the purpose of financing a continuing program of oil palm development. The Government contribution was to reimburse SONADER for the tax and duty component of goods purchased by SONADER in Benin. Direct imports were to be free of import duties.

C. Organisation and Management

2.09 The organisation of the project involved two principal elements (a) SONADER, with overall responsibility for management of the project and the affairs of the cooperatives elements; (b) ten producer cooperatives that were expected to comprise 4,000 farm families each working 1.5 ha of oil palms and 1.5 ha of arable crops. (para 2.15).

2.10 SONADER. As its name implied, SONADER had in principle very wide statutory responsibilities for rural development, but in practice, when the project was under discussion, these responsibilities were limited to fostering oil palm development with lesser emphasis on food crop development in the oil palm areas.

During project formulation SONADER was also given responsibility for ownership and management of the oil mill which would eventually have to be built; this was done because of the evident weaknesses of SNAHDA, the already existing organisation responsible for managing the four oil mills then in operation. Also during formulation, but not discovered by the Bank or FAC until the loan was just about to become effective, SONADER was given responsibility for all rural development activities in the Mono River Valley. The first supervision mission judged that "These responsibilities cannot be undertaken without adversely affecting the progress of SONADER's existing activities" (SMR 26/6/69 para 7). This, together with doubts about its ability to keep adequate financial records, was the only reservation expressed about SONADER's competence to execute the project.

2.11 Farmer participation in the project was not entirely voluntary, since SONADER was legally entitled to:

- oblige land owners in designated development areas to group themselves into producer cooperatives, or alternatively;

- oblige land owners in development areas to rent their land to producer cooperatives, established by the agency; and

- supervise and control, for 25 years, producer cooperatives established in the above manner.

2.12 Physical development was to be directly executed by SONADER with its own staff and funds, and was to include establishment of the oil palm plantations, tree plantings, and cattle herds; road and palm oil factory construction, and the clearing and development of village sites and annual crops areas.

2.13 For the 25-year life of the project SONADER was to manage on behalf of the cooperatives the oil palm plantations, the blocks of annual crops and all productive components of the project, except the oil mill which would be SONADER property. During this period SONADER was to have complete managerial, administrative, and financial control of the cooperatives; all revenues were to accrue to SONADER, and only after all costs, including loan repayments, had been met, would the surplus be paid to the cooperatives. During the development period the ten cooperatives, and an apex organization -- the Cooperative Union, were to be created by SONADER and gradually take over responsibility for management. SONADER had legal power to take over the direction of the cooperatives or even to dissolve them in the event of unsatisfactory performance. In practice, and since the ten cooperatives would be financially indebted to SONADER, the latter was expected to be able to exert a high level of direct control over them for the first 25 years of their existence. It was recognized that only after this time, and after discharge of their debt to SONADER would the cooperatives become autonomous. SONADER was thus required to play two distinct roles in development and operation of the project. First as a development agency, and second as a managing agent for the cooperatives.

2.14 The Cooperatives. Each of the project's ten cooperatives was expected eventually to manage about 600 ha of oil palms, 600 ha of annual crops, and associated tree plantings, cattle, and buildings and equipment.

2.15 Farmers could become members of the cooperatives by leasing land to

the cooperative on a fifty-year basis, by working on the oil palm plantations or both. In compensation the farmers received shares in the cooperative which entitled them to a fixed return. In addition farmers who contributed labor were entitled to a daily cash renumeration plus a share in the profits of the cooperative.

2.16 Each hectare rented to the cooperative entitled its owner to one "A" share and an interest of CFAF 900 (US$3.60) per year. Farmers working for a minimum of two hundred days per year were entitled to a "B" share. Both types of share were valued at CFAF 30,000 (US$120). Farmers qualifying for "B" shares received CFAF 125 (US$0.50) for each days work on the oil palm plantation. Since the "official" daily wage in the project area was CFAF 275 (US$1.1), the farmers were considered to be contributing CFAF 150 (US$0.6) in value of work per day to the project, or CFAF 30,000 (US$120) total. "B" share farmers also received 1.5 ha of cleared land from the cooperative, which they were under an obligation to cultivate in the manner prescribed by SONADER. Any surplus after payment of interest on "B" shares was to be used for capital improvements and to increase the daily wage for workers in the plantations.

2.17 The 1.5 (1.4 net) ha holdings of annual crops were to be worked by cooperative members and their families as individual enterprises, the produce from these being their sole property. The cooperatives, however, were to require farmers to follow a specific rotation for 1.2 ha of each plot. On the remaining 0.2 ha, farmers were to be free to grow what they please. The cooperatives would provide seeds, fertilizer and other inputs which would be paid for by farmers, and marketing and storage facilities. Farmers would have the choice of whether or not to use the latter.

2.18 By way of comment, the provisions for "B" shares and annual crop holdings, were clearly based on the assumptions (i) that there was a surplus of labor in the project area, so that farmers would be willing to work for low wages on the oil palm plantations, and (ii) that the required rotation for the annual crops was sufficiently profitable to be attractive to farmers. In the event neither assumption was justified, and this was one of the factors which eventually caused the project to be substantially revised.

2.19 The ten project cooperatives were to be grouped into a Cooperative Union, which eventually would own the palm oil factory, maize silos and other central facilities. As in the case of the individual cooperatives, the Cooperative Union was to be managed by SONADER for 25 years.

III. IMPLEMENTATION

A. Chronological Review

3.01 Because of the delays mentioned above, implementation of the project started before the credit became effective. However, while the oil palm plantating programme got off to a good start and was completed in accordance with forecasts, the annual crop element was much less successful. From the beginning, supervision missions expressed doubts about progress. By June, 1971, about 1,500 ha of land for annual crops had been cleared, as compared with forecasts at appraisal of 1,750 ha, nevertheless only about 700 ha were being cultivated, and there was a marked lack of demand for cleared land.

3.02 In addition, by mid-April, detailed planning for the oil mill showed that a 20 ton/hour mill was necessary, with provision for increase to 40 ton/hour mill, as compared with the 24 ton/hour mill to be constructed in two stages which was provided for in the project. The increased mill size was required because other milling capacity was no longer available to process oil palm bunches produced by the project.

3.03 Finally the increasing responsibilities laid on SONADER by the Government, principally its continuing involvement in the Mono Project and in rapidly increasing oil palm development in addition to the Hinvi project, seemed to be straining its executive ability and endangering its capacity to implement the project. This was evidenced by poor financial and administrative control of the cooperatives, by financial control of its own operations, and poor maintenance of the plantations.

3.04 In order to rectify the situation a substantial revision was made to the project in 1971. Essentially this involved abandoning any further annual crop development (though FAC insisted on bringing the remainder of the cleared land under cultivation, financed out of its own contribution); utilising the funds so saved to provide the necessary extra finance for the oil mill; and effecting a reorganisation of SONADER so as to achieve tighter supervision of the cooperatives and field control of the plantations.

3.05 After this substantial revision, the project continued to make progress, but with difficulty. The oil mill was constructed, but could not be commissioned on time, because of problems with the water supply. There were difficulties over procurement for the mill auxiliary installation because of collusion between bidders. On the bright side, the annual crop programme began to show positive results as a result of the introduction of ox-teams for farm operations, and the beef cattle enterprise began to benefit from better management.

3.06 Underlying everything were the continuous financial problems of SONADER. These were compounded of SONADER's inability to establish and maintain an adequate system of financial planning and control, and by its fragile financial situation. These financial difficulties came to a head in 1973, with successive devaluations of the US dollar in relation to the CFAF, and in January 1974, a supplemental credit of $600,000 was agreed upon.

3.07 In the end, the project as revised was completed on time in mid 1976. By then, the 6,000 ha of oil palm were in production; the oil mill began operating in 1974; about 1,500 ha of annual crops were being farmed, part of it cultivated by ox-drawn equipment. Yields from the oil-palms cannot yet be forecast with accuracy, but have recovered from the adverse effect of the drought. One problem which was never solved was the weakness of the accounting procedures and financial control of SONADER.

B. Project Revisions

3.08 The revisions made to the project in 1971 involved the following:

a) change from construction of the mill in two phases (first 16 ton ffb/h and second 24 tons ffb/h) to construction of a single,

20 ton/h mill, with room for expansion to 40 ton/h if required later;

b) increase in cost of the mill to allow for price escalation and also extra ancillary facilities;

c) reduction of annual crop area from 6,000 ha to 1,700 ha;

d) reduction of maize silo capacity from 3,000 to 2,000 ton.

3.09 These changes led to revised project cost estimates, as shown below:

CFAF	Appraisal	Revised	
	--------CFAF Million-----		
Oil Mill	.556	1.369	1/
Maize Silos	.040	-	
Oil Palm Development	.945	1.076	
Other Ag. Development	.262	.111	
Infrastructure	.158	.202	
Administration	.179	.212	
Studies	.040	.036	
Contingency	.189	.035	
Total	2.370	3.021	

1/ including the second line with total output of 40 t/hour.

3.10 These revisions were agreed to by the Executive Directors on September 13, 1971, (IDA R71-63), and the project description was amended appropriately.

3.11 It should be noted that this revised funding was based on the assumption that FAC would provide CFAF 1,235.6 million (US$4.5 million), IDA CFAF 1,269.9 million (US$4.6 million) and the remaining CFAF 515.8 million (US$2 million) would come from the Government (CFAF 145 million) and SONADER self-generated funds (CFAF 370.8 million). Government contribution has never been paid and this was one of the causes for SONADER's continuing financial problems. The installation of a second processing line has been postponed because of lower production than expected. Subsequently, under the adverse impact of currency realignments (US$/CFAF exchange rate declining from 1:277 to 1:225) Credit 144-IDA was increased in February 1974 by US$600,000 to US$5.2 million. In late 1973, FAC also increased its grant contribution by US$510,000 equivalent.

3.12 The following tables show the finally agreed financing plan, and the planned disposition of the revised IDA credit.

Final Planned Disposition of IDA Credit
US$ '000

Category I	Studies and construction of palm oil mill, associated installations and vehicles.	4,158
Category II	(a) Development of oil palm plantations	830
	(b) Other agricultural development	159
Category III	Contingencies	53
	Total	5,200

C. Costs, Disbursements and Procurement

3.13 The following table compares appraisal estimates of project cost with actual disbursements.

	Actual				Appraisal
	CFAF Million				CFAF Million (US$ 1 = 247)
	IDA	FAC	Govt	Total	Total
Studies	-	40	-	40	40
Oil palm development	230.9	458.5	-	689.5	945
Oil palm mill	962.4	-	-	962.4	556
Annual crop development	-	201.0	4.2	205.2	197
Livestock	1.0	5.9	0.9	7.8	37
Afforestation	-	5.7	14.7	20.4	29
Staff and training	25.9	53.7	-	78.6	40
Village sites, roads vehicles, etc.	7.3	94.0	18.1	119.4	194
Maize silos	-	40.3	-	40.3	40
Overheads and Maintenance	9.0	66.9	14.9	90.8	124
Contingencies	-	-	-	-	168
Rent	-	-	10.8	10.8	-
Total .	1,236.5	966.0	63.6	2,266.2	2,370

3.14 These costs have been determined through the analysis of disbursement files kept at SONADER. Costs related to contracts or suppliers invoices are accurate; land development cost (oil palm and annual crops at forestation) overheads and infrastructure are based on SONADER's allocations to project cost without regard to actual costs which are unknown (even by SONADER) and for which it is impossible to obtain further details. IDA supervision missions have recommended many times that SONADER take action to improve the accounting procedures. In 1974 and 1975 FED had financed a consultant, SORGEM, to train staff and establish new procedures but this action has not brought any significant results. Balance sheets and financial statements, although more accurate, are still unaudited and issued late, budgetary control and financial management remain weak. SONADER has generally followed IDA guideline for procurement, in particular for the oil mill. However, an IDA supervision mission recommended in 1974 to not finance the exaggerated cost of a water tower (US$150,000) since the contract was awarded without IDA consultation. This recommendation has not been followed ultimately because SONADER would have had to pay for a Government mistake and this could have aggravated project execution.

3.15 Disbursement and procurement were complicated. Until the 1971 revision FAC paid 100% for some items and FAC and IDA shared in the proportion 54 to 46, for the oil palm plantations; staff and training; village sites, roads etc; livestock; and overheads and maintenance. Thereafter IDA paid 100% for the ancillary facilities; the oil palm plantations and staff and training continued to be shared as before; all the rest were paid for 100% by FAC. Prior to 1969, FAC of course paid everything.

IV. EVALUATION

4.01 For review purposes the project can be divided into three parts: (a) the productive components; (b) institutions; and (c) cooperative and social aspects.

A- Productive Components

4.02 a) Establishing and Bringing to Maturity 6,000 ha of Oil Palms

	Planned and Actual Plantings			
Calendar Year	1968	1969	1970	Total
ha planted-planned	1,800	1,800	2,400	6,000
actual	1,835	1,842	2,403	6,075

Plantings, as shown by the table, were on schedule and made with high potential seedlings of good physical quality. Maintenance was generally good through 1971 and an invasion by the spear grass weed (imperata spp) extending to 1,070 ha had been cleared up by the beginning of the 1972 wet season. In 1972, however, a general fall in maintenance standards occured and has not been corrected to date. The basic cause is financial. Cooperators are unwilling to work for the CFAF 125/day paid by SONADER to the cooperatives for maintenance work in the immature plantations, unless no other work is available, as during the dry season, when there is no difficulty in obtaining labour. Thus during the rainy season maintenance is less than would be acceptable an commercial estates elsewhere. To correct the situation, SONADER has begun to use machinery for

maintenance specially financed by FAC. However, it is unlikely that yield depression because of low maintenance is significant. Moreover, because of the low yield potential of the area it is doubtful whether a large increase in maintenance costs is economically justifiable.

4.03 Despite the excellent performance in planting, and reasonable maintenance, it is not clear at present whether or not yields will reach the levels anticipated at appraisal. This is due to the low rainfall experienced in 1971/72 and 1972/73 which occured at a critical time in the early growth of the plantations. Also it may be that the rainfall pattern is more unfavourable than was at first thought.

4.04 The attached table shows the distribution of rainfall by crop-year and by plantation. The overall average crop-year rainfall for the years 1969/70 to 1974/75 in the project area was about 980 mm as compared with about 1,170 mm during the years 1941-1966 at Niaouli on the boundary of the project area. However, two of the plantations had rainfall within 5% of the Niaouli 25-year average. Within the project area there were considerable differences between the plantations, that with the least rainfall, Dodji-Sehe, having about 1/3 less than that with the most, Agbotagan. These data do not show any apparent geographical pattern when plotted on a map.

4.05 From the point of view of oil palm growth and development, a very significant constraint is the incidence of long dry spells. However, measured by the number of three monthly periods with rainfall of less than 100 mm, the drier plantations do not appear to be much worse in this respect than are the plantations with high rainfall.

4.06 On the basis of data available, it seems clear that the substantial differences between plantations was an adverse factor unknown to the appraisal mission. Furthermore the abnormally low rainfall of two years has substantially affected the six-year average. However, all years were below the Niaouli average and only two years were within 10% of it. Thus it seems possible that the long-term average rainfall in the project area, and hence yields, will be somewhat lower than that envisaged at appraisal.

4.07 The following table shows original and revised estimates of future yields.

Comparative Yields - Estimated and Revised
Tons ffb/ha

Years after Planting	5	6	7	8	9	10	11	and 12 Subsequent
Appraisal Estimates (1969)	3.0	5.0	6.5	7.5	8.0	8.0	8.0	
Revised IRHO (1973)	0.5	1.5	3.0	4.0	6.0	8.0	8.0	
Revised Bank (1973)	0.3	1.7	2.3	3.6	5.6	6.3	7.0	
Last Estimates (1976)	0.5	1.5	3.0	4.0	6.0	7.0	7.0	

4.08 Harvesting of ffb started in the first three months of 1973, when 116 tons were produced by the cooperatives of Agbotagon and Goulo, planted in early 1968. Thereafter the progression of yields and production is as follows:

Agricultural Year

	1973/4		1974/5	
	Yield Tons/ha	Production Tons	Yield Tons/ha	Production Tons
	(6th year after planting)		(7th year after planting)	
Agbotagon	2.939	1.184.890	2.626	1,605.050
Attogon	0.704	429.972	2.490	1,519.360
Goulo	2.318	1,423.473	1.875	1,151.396
	(5th year after planting)		(6th year after planting)	
Koundokapoe	0.221	137.954	1.864	1,153.874
Sedje			1.099	661.063
Rodji			0.629	391.600
			(5th year after planting)	
Sehe				68.330
		3,176.289		6,550.676

4.09 The above figures show that in the sixth year after planting, average yields over the project area were about 1.4 ton/ha, which is much lower than the appraisal estimate, but about in line with the revised Bank and IRHO estimates of 1973. Furthermore the average yield should be adjusted to allow for the fact that only about 300 ha at Attogon were productive that year, the remainder having been burnt.

4.10 Any estimate of how production is now likely to develop must take into account two further factors, the incidence of fire, and of theft. During the first three months of 1973, 465 ha of trees were burnt as a result of fires spreading from where farmers were burning their fields. However, that was an abnormally dry period, and the problem has not reoccured.

4.11 Theft, accentuated by inadequate organization of ppb collection is however an important problem which could jeopardise the viability of the project. For instance, the Report of SONADER for 2nd Quarter of 1975, para 6.3, refers to "the eternal problem of theft of fruit bunches". Essentially it is due to the low prices paid to the cooperatives for ffb (about 3.8 frs per kilo of ffb) which in turn affects the cash earnings of the workers on the plantations and cooperative cash flow.

b) Annual Crop Development

4.12 The object of the annual crop development component of the project was (i) to introduce a system of rotational cropping to replace the "shifting cultivation" generally practised in the project area; and (ii) to promote the use of the seed of improved varieties, fertilisers and other inputs. Through these measures it was expected that substantial gains in productivity would be achieved and that the average participating family, would achieve a cash income from annual crops alone of about CFAF 42,150 (US$172) in 1980, as compared with about CFAF 12,000 (US$49) cash income annually without the project (constant 1967 CFAF).

4.13 The proposals concerning annual crops were that (i) a standard 1.5 ha holding (1.4 ha net) should follow a rotation which, under the two-season rainfall regime of the project area, would permit the cultivation each-year of 0.4 ha groundnuts, 0.4 ha cotton, 1.2 ha maize, and 0.2 ha of other crops; and (ii) the use of seed of improved varieties, fertilisers and other inputs, would permit average yields to rise by 1980 to 1,260 kg/ha (in shell) for groundnuts, 1,000 kg/ha (seed cotton) for cotton, and 2,300 kg/ha (grai) for maize. It was assumed that cultivation would continue to be by hand.

4.14 It was expected that the annual crop blocks would be developed quite rapidly as follows:

1968	1969	1970	1971	1972	1973	1974	1975	1976
			ha (Cumulative)					
317	600	1,150	1,750	2,400	3,300	4,200	5,200	6,000

The blocks were to be cleared by SONADER which also was to mark out the individual holdings and construct access roads. While 1.5 ha was to be the norm, families with sufficient labor were to be permitted to operate two holdings, but 3 ha was the absolute maximum allotable to an individual cooperator.

4.15 The annual crop development program soon ran into difficulties; fewer than expected farmers were prepared to take up holdings, input use was minimal and yields failed to reach appraisal targets. A Bank supervision mission in early 1971 attributed the failure to (a) farmers' unwillingness to give up traditional systems of cultivation and adopt a complex rotation requiring a high degree of discipline; (b) poor results of cotton cultivation, a result of heavy insect infestation; (c) low yields and prices for groundnuts; and (d) the lack of agricultural credit and markets at assured prices. For all these reasons, farmers preferred to clear and cultivate small areas of bush for their own food crop requirements in the traditional manner, rather than take up cooperative plots with the attendant obligations. The mission concluded that by 1976 (the closing date for the IDA credit) 3,000 ha might be developed if solutions were found to the above problems and some changes made to the rotation. Subsequently, however, it was agreed to limit further work to the preparation of 1,700 ha for annual cropping.

4.16 Since 1971 an unforeseen development has revitalized the annual crop component of the project. This is the introduction of draft oxen and plows, harrows, cultivators and carts with technical assistance financed by FAC. Original trials with draft oxen started in 1969, and the number of animal traction units (two oxen and equipment) has grown quite rapidly,as has the number of farmers using animal traction (farmers who owns units rent these to other growers). Thus in the 1975 crop season a total of 751 ha (442 main season; 309 short season) were cultivated with about 150 pairs of oxen and some 3,300 haulage trips were made with ox-drawn carts.

4.17 In the ten cooperatives 880 farmers used ox-drawn cultivation provided by 155 units. The benefits of ox-drawn cultivation are perceived by farmers to be so substantial that most of the 6,262 ha available for annual cropping have been taken up by farmers who are using hand cultivation until such time as they can obtain oxen and equipment. A requirement to receive credit for oxen and equipment purchase is that the farmer has removed all the stumps and roots from his land, a very substantial undertaking in the so-called ZOCA (zones de culture attelée) where only 1,700 ha were prepared by SONADER and where even this involved simply cutting off trees and shrubs at ground level. Despite the work involved and the further requirement that the farmer must make a downpayment of CFAF 30,000 (US$120) for his oxen and equipment, 746 had been de-stumped by March 1976.

4.18 The benefits of ox-drawn cultivation are the higher yields permitted by timely planting and weeding at times of the year when labor shortage is the principal constraint. Derived from a sample survey, SONADER estimates of yields for 1973-1975 are as follows:

Comparison of Yields from Hand Cultivated and Ox-Drawn Equipment Cultivated Farms

Crop	Year	Main Season		Short Season		Main Season		Short Season		Farmers		
		Hand	Ox-Drawn	Hand	Ox-Drawn	Hand	Ox-Drawn	Hand	Ox-Drawn	Hand	Ox-Drawn	Total
		Ha Cultivated				Yields, kg /ha				Numbers		
Maize (grain)	1973	793	111	600	64	1,510	2,585	582	2,505	1,440	352	1,792
	1974	954	289	624	149	1,000	2,800	900	2,100	2,426	799	3,225
	1975	996	380	1,188	304	1,100	2,300	1,000	1,900	2,099	880	2,979
Groundnuts (in shell)	1973	16	16	7	21	1,580	2,505	1,521	2,550			
	1974	31	28	28	45	1,000	3,000	1,300	1,900			
	1975	55	38	13	80	1,800	2,000	800	1,800			
Cowpeas (grain)	1973	45	5	-	2	N/A	598	571	588			
	1974	20	12	5	8	800	1,100	N/A	800			
	1975	20	21	7	12	700	1,000	300	400			
otton Seed otton)	1973	-	-	-	46	-	-	-	599			
	1974	-	-	-	-	-	-	-	500			
	1975	-	-	-	53	-	-	-	400			

4.19 The table shows clearly the growing number of farmers and area involved in annual cultivation, and the substantial increases in maize and groundnut yields thus achieved. The latter would be significant even if SONADER's recording is faulty, and explains the high demand among farmers to acquire these facilities. The talbe also shows the generally poor performance of cotton, and the room for improvement in cowpea yields, though the sample is scarcely large enough to draw substantial conclusions.

4.20 It does however, seem fair to suppose that the appraisal estimates of yield for maize and groundnuts will by and large be reached by 1980, not only on the revised area of 1,700 ha but also on the whole of the originally projected 6,000 ha, provided that there is no check to the introduction of animal-drawn cultivation. The most recent reports suggest that there are some constraints on the supply of animal for this, which is a matter to which SONADER and Government should devote attention in the future.

4.21 In short, the annual crops program has now reached the point where it should provide a sound basis for further development; however, the above satisfactory results are likely to be eroded: SONADER has not been able to organise the development of animal traction since 1974, because of the difficulty to purchase oxen at low prices fixed by Government. This could rapidly discourage farmers.

4.22 Livestock. The project included the purchase of 310 cattle for the development of beef production. Cattle has been purchased accordingly and allocated to 10 cooperatives, including the four financed by FAC. In 1975, the herd was 1030 heads. Veterinary services are adequate and the herd develop satisfactorily. However, the benefits of that component do not accrue to the cooperatives because animals available for sale are sold at a price fixed by Government about 50% of the market price. The herd consists mainly of Ndama and few of them can be adequately trained for traction because of their small size.

4.23 Afforestation. 1000 ha of cassa and teak have been planted in 1972 and 1973 in line with appraisal targets. The plantations attached to each cooperative have not all been properly maintained and some of them have suffered from bush fire at their early stage of development. However, they have generally developed satisfactorily. No indication are available on the future number of poles made available to the cooperatives.

4.24 Oil Mill. The oil mill contract was awarded to de Wecker (Luxemburg), the lowest bidder in 1971 after an international bidding. Other bidders were SPEICHIM and VOYER (France). The construction of the mill started in 1972 and was completed in 1974 as scheduled. However, processing commenced only in mid 1975 because of delays in installing a tubewell, the inadequacy of water supply (about 10m3/hour instead of 20m3 envisaged) and the procurement of pumping equipment. Total investment cost amounts to CFAF 962,4 million (US$3.9 million) as anticipated in 1971 when the project was evaluated (detail at Annex 2)

4.25 The functioning of the oil mill is satisfactory but is has had difficulties because of several factors: first, peak production is higher and more concentrated than anticipated at appraisal,and, as a result, the mill was heavily congested in the peak season of 1976 and 1977; second the mill cannot handle the high proportion of kernel (about 6-7% of ffb, instead of 4-5%) anticipated for which it was not designed (possibly because of hybrid seeds); and third, oil storage capacity is inadequate and has to be increased. Furthermore, some improvements of the machinery were to be done by WECKER under the guarantee clause of the contract early in 1977.

4.26 The quality of oil is also not satisfactory because of the inadequacy of field organization to collect fruits (see para 4.12). As a result, free fat acid content (ffac) is usually above 7%. While the mill is designed to produce oil with a ffac below 4%. The situation is aggravated by the inadequacy of storage conditions either at the mill or at the harbor, on the other hand, this should not affect prices since most of the oil is marketed domestically or in Nigeria. No data are available on the quantities and price at which oil is sold on the local, Nigerian and other export markets. No data are also available concerning processing, maintenance, transport and storage costs.

4.27 The maintenance of the oil mill is almost adequate although it should be improved and the functionning oil mill is supervised twice a year by an expatriate engineer provided to SONADER by FED under an arrangement related to the AGONVY oil mill. IDA approved the appointment of an oil mill manager as specified in the Credit Agreement. During negotiations in 1971 SONADER agreed to set up a Technical Unit responsible for the maintenance of the three oil mills it was expected to manage. This unit exists but still lacks technical staff and workshop facilities. This becomes a real need now that SONADER also manages the three oil mills formerly under SNAHDA supervision.

4.28 SONADER is now planning to expand the Hinvi oil mill capacity from 20 t per hour to 40 t per hour to cope with expected production in 1979-80. In the meantime, the FED engineer has been able to increase the output of the presses to about 30 t/hour and has designed plans to immediately increase kernel crushing potential (from 1 t to 1.5 t/hour).Altogether, additional investment required at Hinvi is estimated at CFAF 900 million (US$4 million) in 1976 prices and could alone justify the financing of a second project provided that an adequate supply be guaranteed by an improvement of collect organization (para 4.12)

B. Institutions

4.29 The main Beninese institutions involved in the project were SONADER and SNAHDA*. The support given by the Bank to SONADER appears to have been well-justified and successful. Essentially SONADER was responsible for promoting production, while SNAHDA was responsible for processing and sale of palm oil and palm kernel oil. However, because of misgivings about SNAHDA's capacity to construct and manage the mill required to process project output, it was agreed that SONADER should do this also. It may be argued that from the point of view of institution building, it would have been preferable to have retained SNAHDA and attempted to improve its performance. However, given that the project mill was only one of several operated by SNAHDA, it is unlikely that the Bank could have exerted enough leverage to have made an appreciable improvement in SNAHDA's efficiency. The choice taken was probably the correct one.

4.30 A crisis in SONADER's affairs came to a head in 1973. At that time it was trying to carry the burden of a much enlarged responsibility for rural development, as well as a rapidly accelerating oil palm development program, aggravated problems caused by a very adverse cash-flow and financial resource situation. These factors together meant that the standard of management of the oil palm plantations was slipping (aggravated by the adverse weather), control and guidance of the cooperatives was lax, and SONADER's own financial policy and control was poor.

4.31 There is little doubt that the intervention of the Bank and FAC at that time succeeded in restoring the situation and enabled SONADER to retrive itself. Essentially that intervention provided for the injection of more funds into the project (US$600.000 from the Bank, and US$520,000 from FAC) and for an administrative reorganisation intented to bring about tighter field control of the plantation operations, and better guidance for the cooperatives. It appears that by and large these actions achieved their purpose, though, as has been mentioned before the problem of ensuring SONADER's financial policy and control does not even now seem to have been fully solved.

4.32 Two more points may be made to demonstrate the basic soundness and viability of SONADER as an institution. One concerns the volume and adequacy of the reports provided by SONADER. These have consistently improved in both quantity and quality once the project started and provide a mass of data concerning all aspects of its operation. The other concerns the introduction of animal-drawn equipment. The fact that when the annual crop programme as originally conceived was obviously failing, SONADER attempted a new approach with FAC assistance, clearly demonstrates its flexibility and willingness to learn from experience.

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* Note: These were changed at various times, and SONADER is now called SOBEPALH, and SNAHDA is called CONICOG. However, their functions have not substantially changed and the same names have been retained here for convenience.

C. Cooperative and Social Aspects

4.33 Over this part of the project there still hangs a large question mark. Obviously in the early years of the project, the farmers who were members of a cooperative did not perceive themselves as owners of the oil-palm plantations, responsible for their success o failure. Rather the plantations were regarded as places where remuneration was very low in relation to work done, and farmers only sought employment there if no other was available. This still seems to be the situation, so that there is competition between work on the plantations and work on farmers' own fields. This competition is particularly important during the rainy season.

4.34 Thus although an operating framework of cooperatives has been set up, it is difficult to conclude that it has really taken root. Perhaps this will change with the spreading use of animal-drawn implements, in the introduction of which the cooperatives have a real part to play, as also in the distribution of inputs for improved agricultural practices. However, as regards the social aspects, there seems little doubt that the project has had a substantial impact on the farmers concerned. In an agricultural area where natural conditions (climate, soils) are marginal and potential productivity is low, nevertheless a new technology has been introduced and farmers can be seen to be adopting better practices than in other parts of the country. This must be counted as a major achievement.

4.35 Furthermore the provision of roads and village sites by the project will permit farmers to benefit not only from higher incomes but also from a better quality of life.

4.36 Financing of cooperatives. Projected cash flows for cooperation are not satisfactory, even if the expected yield of 7 tons of ffb per ha is reached. First, cooperatives are heavily indebted; and second, SONADER (and government) are not keen to increase the price for ffb paid to cooperatives. Current price of CFAF 5 per kilo of ffb is much below the price paid in Ivory Coast (CFAF 9) (where interests are subsidised). However, in present circumstances, it is unlikely that Government would agree to change its policy because of the competition between wild and selected palms, the former being transported and processed at a higher cost. In these circumstances, cooperatives would never be able to repay their debts as provided for in the Credit Agreement. Under present price arrangement, the financial rate of return of the investment is minus 0.45 over 25 years, but it could be raised to 4.7% assuming an ffb price of CFAF 7 Frs per kilo (+40%) that SONADER can reasonably afford to pay given the present and future trend for oil palm products. Government has been asked several times and this was a condition of renegotiations of the credit in 1971 to make proposal satisfactory to IDA to resolve this issue. No answer has been obtained yet.

V. ECONOMIC RESULTS

5.01 **The rate of return on the project has been re-calculted as follows:**

In the cost stream:

a) **labor costs through 1976 for oil palm plantations and palm oil mills are included at cost whether or not provided by cooperative members, and thereafter are costed at a minimum of CFAF 125/day (US$0.5) until 1975 and CFAF 200 (US$0.8) to better reflect the**

opportunity cost of such labor;

b) no further costs are attributed to the annual crop production component of the project post 1975 other than recurring costs for the seed and other inputs employed and the replacement of oxen and equipment, on the grounds that current levels of production can be maintained for at least 10 years without further investment in either infrastructure or extension and other farmer support services.

In the benefit stream:

c) no deduction is made for palm oil and kernel production forgone from wild palms on land now occupied by the project on the grounds that the net benefit would be small and difficult to quantify and in the calculation compensated for by attributing a uniformity round-the-year value to field labor of CFAF 125/day (US$0.5) through 1975 and CFAF 200/day (US$0.8) thereafter; and

d) assuming annual crop production will stabilize at 1975 levels on the 1500 ha actually cropped under SONADER supervision, and treating as benefits from the annual crop program the difference between actual production and estimated production under traditional hand cultivation practices. Thus, it is assumed that farmers cultivating by hand obtain an increment in yield of 25% through project participation and these using ox-drawn cultivation substantially more.

In addition, costs and benefits of the afforestation and livestock components of the project are removed from both streams. The grounds for this are that: (a) experience shows the livestock program must be treated as an experiment and the probably substantial benefits from the afforestation program cannot yet be quantified; and (b) the impact of these components on the overall rate of return is negligible.

5.02 An economic rate of return of about 12% over a life of 25 years was estimated at appraisal. In the calculation the cost of labor provided by cooperative members in both investment and operating phases was estimated at zero. Furthermore a deduction was made from the benefit stream to allow for the estimated value of that production sold for cash that would have been produced on land occupied by the project were not implemented. The merits of this technique are a matter for conjecture, particularly as the success of ox-drawn cultivation demonstrates a labor bottleneck for much of the year, and in practice considerable recourse was made to hired labor from outside the project area for work on the plantation. Consequently, given the major changes that have occured since appraisal, including the delayed entry into production of the palms, the expected low oil palm yields, the sharp rises in the value of outputs, and the failure of the original plans for annual crop development, the calculation of a revised rate of return on the same basis for comparative purposes would not appear appropriate in light of the present circumstances.

5.03 In calculating the economic rate of return, the timing of investment costs was as follows:

	Up to 1969	1970	971	1972	1973	1974	1975	Total
actual:	448.9	181.2	196.6	403.4	707.5	175.8	112.8	2,226.2
constant 1976 terms:	982.3	370.5	378.8	714.0	1056.0	214.4	117.6	

5.04 As regards benefits from palm-oil, timing should be based on the assumption that each plantation will begin production five years after planting and yields will follow the progression as follows:

	Year 5	6	7	8	9	10	11
ffb ton/ha	0.5	1.5	3.0	4.0	6.0	7.0	7.0

5.05 Yields of palm-oil are put at 21% and of palm kernels at 5% at full production.

5.06 Price of palm oil and palm kernels are taken to be CIF US$578 and US$ 240 respectively in 1980, equivalent to CFAF 13,400 per ton of ffb, in 1976 prices. These prices are in line with the commodity price forecast.

5.07 There is no reliable data in Benin to calculate the economic benefits of the annual crop component; therefore the calculation has been done on the basis of farmgate prices recently estimated in neighboring countries.

5.08 The rate of return is sentitive only to oil palm yields variation since the benefits of the annual crop components are small. Given the uncertainties concerning the estimates of oil palm production, the rate of return has also be calculated with lower yields and would be 2.5% with an average yield of 6 t/ha and zero % with yield at 5 t/ha. Difference with appraisal estimates results primarily from the high benefits anticipated from the annual crop development, benefits which have not yet fully materialized, although clear indications show that the potential for further development still exists.

VI. CONCLUSION

6.01 IDA Performance. The project has been closely supervised since its beginning. IDA has demonstrated its flexibility to cope with the problems encountered:

a) in 1971, the project has been amended to insure the adequate financing of the Hinvi Oil Mill;
b) in 1973, additional financing was also provided to compensate for losses due to exchange rate variations.

Supervision missions have been generally more concerned with SONADER finance than with cooperative finance because they considered that SONADER was essential to project success and that no solution to cooperative problems could be found with low yields estimated in 1973-1975 when the effects of draughts were at their maximum. However, we now have enough evidence that the production would be close to appraisal estimates, and therefore, cooperative financial problems can be resolved through an increase of the price of ffb.

6.02 Future of the project. The project now faces two major issues concerning the organization and cooperative finances. As originally conceived, the project was intended to integrate oil palm and annual crops within a cooperative framework expected to become autonomous with the support of a single agency SONADER. Now Government has decided that the "CARDER de l'Atlantique" would be responsible for the extension work and that SONADER (now called SOBEPALH) would manage the collection of palm fruits, thus making two different agencies intervening in the same project area; thus giving up the integration concept. These new arrangements would certainly aggravate the difficulties already met by SONADER to properly organize the collection of fruits as discussed at para 4.02. Furthermore, Government is studying the possibility to take over from cooperative the oil palm plantations which would be maintained and harvested by SOBEPALH with hired labor. The second issue results from the fact that cooperatives do not receive an adequate share of the value of oil palm plantations. With a price of CFAF 5 per kg of ffb (37% of net revenue), they cannot either pay more than CFAF 200 (US$0.8) per manday to cooperators, nor repay their debts. Thus the important concept of autonomous cooperative is jeopardized. Government is aware of those problems and has temporary maintained SOBEPALH responsible for cooperative supervision in the project area. Further discussion with Government on these important issues is still possible because SOBEPALH is looking for external financing to increase the output of the Hinvi oil mill. IDA has, in principle, agreed to examine a new Hinvi project which would finance the Hinvi oil mill extension together with the development of ox-drawn cultivation. This would be discussed again with Government during the forthcoming negotiations of the Technical Assistance project scheduled in March/April 1977.

BENIN

ANNEX I
Table 1

HINVI PROJECT

Cooperative Cash Flow (600 ha)
1976 Terms
(CFAF'000)

	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 11	PY 1
INFLOWS												
Development Loan	102400	12700	9000	9000								
Short term advances			3150	990	990							
Sales of ffb 1/					1500	4500	9000	12000	18000	21000	21000	210
Total Inflow	102400	12700	12150	9990	2490	4500	9000	12000	18000	21000	21000	210
OUTFLOWS												
Plantation Development	79800	9000	9000	990								
Additional land clearing		3150	3150	990	990							
Maintenance (tools, fertilizers)				3420	3420	3420	3420	3420	3420	3420	3420	342
Maintenance (labor) 2/				3360	2880	2400	2400	2400	2400	2400	2400	240
Harvesting (Labor) 3/				180	540	1080	1440	2160	2520	2520	2520	242
Coop overheads				3060	3060	3060	3060	3060	3060	3060	3060	206
Rent				540	540	540	540	980	980	980	980	98
Annual crops	19700											
Livestock		3700										
Forest	2900											
Total Outflow (before debt services)	102400	12700	12150	9990	11550	10440	10500	10860	11960	12380	12360	1238
(deficit) surplus					(9060)	(5940)	(1500)	1140	6040	8620	8620	862
Manday worked					17700	17100	17400	19200	22800	24600	24600	2460

1/ maximum yield: 7t/ha
2/ CFAF 250 per manday

ANNEX I
Table 2

BENIN

HINVI AGRICULTURAL PROJECT

EXPOST EVALUATION OF THE ECONOMIC RATE OF RETURN
(in 1976 constant terms)

	68/69	70	71	72	73	74	75	76	77	78	79	80
Gross Value of Incremental Production												
ffb (13 frs)					4.8	56.3	85.2	216.8	332.3	403.9	521.5	552.5
Maize (25)							37.1	37.1	37.1	37.1	37.1	37.1
Groundnut							7.1	7.1	7.1	7.1	7.1	7.1
Cowpeas							0.6	0.6	0.6	0.6	0.6	0.6
Cotton							0.9	0.9	0.9	0.9	0.9	0.9
Tech./Cassia												
Cattle												
Subtotal					4.8	56.3	130.9	262.5	378.0	449.6	537.2	598.2
Project Cost	448.9	181.2	196.6	403.4	705.5	175.8	112.8					
Equipment Renewal										40	40	40
Plantation Maintenance					10.8	21.6	36	36	36	36	36	36
Annual Crop Maintenance							17.4	17.4	17.4	17.4	17.4	17.4
Labor Cost						10.6	21.0	34.8	38.4	42	45.6	49.2
Cooperative Management						9.2	18.4	30.6	30.6	30.6	30.6	30.6
Subtotal (current term)	448.9	181.2	196.6	403.4	716.3	217.2	205.6	118.8	122.4	166.0	169.6	173.2
In current 1976 terms	982.3	370.5	378.8	714.0	1069.1	264.9	214.4	118.8	122.4	166.0	169.6	173.2

ANNEX I
Table 3

BENIN

HINVI PROJECT

HINVI OIL MILL: INVESTMENT COST

(CFAF Million)

	1971	1972	1973	1974	1975	Total
OIL MILL COMPLEX						
Oil mill (including civil works)		194.2	479.9	71.5		745.6
Access roads		1.6				1.6
Auxiliary buildings			15.5			15.5
Water and Electricity network			1.3	5.3		6.6
Tools					11.8	11.8
Office Equipment			0.3		0.6	0.9
Telephone Lines			8.5			8.5
Tubewell		21.6				21.6
Pumps				9.8	0.2	10.0
Water Tower			33.5			33.5
Technical Assistance	1.9	1.6	0.8	0.5	3.3	8.1
Subtotal Oil mill	1.9	219.0	539.8	87.1	15.9	863.7
VILLAGE						
Housing		10.2	4.7		1.2	16.1
Water supply			13.1	1.1		14.2
Electricity line			10.3	12.0		22.3
Subtotal Housing		10.2	28.1	13.1	1.2	52.6
TRANSPORTATION EQUIPMENT						
Fork Cart		3.9				3.9
Vehicles		0.7				0.7
Tip Trucks		11.8				11.8
Tank Truck				11.7		11.7
Tractors and Trailers				13.5	5.8	19.3
Subtotal Vehicles		16.4		25.2	5.8	47.4
TOTAL	1.9	245.6	567.9	125.4	22.9	963.7

BENIN

HINVI PROJECT

Table Rainfall in Grand Hinvi Project Area by 3-Monthly Periods, Showing Crop-Year Figures for each Cooperative Plantation.

	Sedje	Koundokpoe	Dodji Gbeto	Agbotagon	Attogon Dessa	Zegoulo	Adjan	Hanafin	Dodji-Sehe	Kpoe-Kpannon	Annual Average
1969.3	225.7	211.5	153.9	258.2	142.6	170.1	222.2	169.1	200.8	156.3	10 Cooperatives
.4	234.9	295.2	189.9	173.2	272.2	220.1	289.6	275.3	210.6	207.1	
1970.1	108.1	127.1	127.1	134.5	164.4	94.7	95.3	198.2	104.5	139.1	
70.2	528.9	503.5	386.9	699.7	495.5	507.1	478.2	649.3	442.5	464.2	
	1,097.6	1,137.3	857.8	1,265.6	1,074.7	992.0	1,085.3	1,291.9	958.4	965.7	1,071.6
1970.3	98.1	157.3	126.1	151.3	117.5	144.4	153.1	106.0	136.3	139.1	
4	325.7	212.4	320.1	285.3	186.8	302.2	238.2	267.7	265.5	237.9	
1971.1	95.9	156.9	179.5	183.2	188.5	168.9	175.4	258.3	193.3	114.6	
1971.2	453.6	442.1	308.9	297.3	295.7	417.7	348.7	439.5	200.4	271.3	
	973.3	968.7	934.6	917.1	788.5	1,033.2	915.4	1,071.5	795.5	762.9	916.1
1971.3	172.5	246.7	204.9	268.9	149.4	248.0	203.9	246.0	250.9	246.4	
.4	40.1	96.6	94.9	87.4	120.7	72.9	46.8	149.1	132.1	39.9	
72.1	141.6	166.1	260.0	216.5	223.9	182.6	189.9	116.9	258.7	146.6	
2	510.3	541.5	506.7	728.9	513.3	515.9	509.5	647.8	536.3	552.9	
	864.5	1,050.9	1,066.5	1,301.7	1,007.3	1,019.4	950.1	1,159.8	1,178.0	985.8	584.0
1972.3	203.8	182.2	143.4	234.8	138.8	234.0	175.6	231.9	128.5	148.6	
.4	74.5	151.3	105.6	102.9	53.7	74.9	94.2	108.2	81.4	122.4	
73.1	42.1	97.9	80.0	56.1	54.4	71.9	93.1	70.7	103.7	96.9	
.2	270.4	277.4	270.5	400.0	224.4	506.3	217.4	328.1	223.7	284.2	
	595.8	708.8	599.5	793.8	471.3	887.1	580.3	738.9	537.3	652.1	656.5
1973.3	429.8	340.5	292.0	375.7	288.6	518.3	453.4	342.2	340.7	281.5	
.4	95.8	236.7	164.4	250.5	133.7	146.1	89.3	209.7	256.9	132.8	
74.1	91.7	114.9	143.3	120.1	125.5	90.6	102.4	96.6	145.5	181.3	
.2	386.9	444.7	462.9	537.0	473.9	468.2	515.3	517.4	476.9	442.9	
	1,004.2	1,136.8	1,062.6	1,383.3	1,071.7	1,223.2	1,074.3	1,165.9	1,220.0	1,037.9	1,028.4
1974.3	290.4	408.1	325.5	325.6	299.0	335.2	356.3	432.0	325.5	432.0	
.4	61.4	163.9	189.0	198.2	165.4	85.2	90.4	115.8	127.5	247.9	
75.1	58.5	154.8	93.0	173.2	51.7	152.0	133.3	151.6	84.0	96.6	
.2	407.0	567.4	572.1	643.9	462.6	522.8	525.2	575.8	533.5	529.2	
	817.3	1,294.6	1,189.6	1,340.9	1,078.7*	1,145.2*	1,109.8	1,272.9*	1,179.0	1,253.5*	1,168.1
10-Year Average:	892.1	1,047.9	951.8	1,167.1	915.4	1,050.0	952.5	1,116.8	795.0	943.0	983.2

Note: These figures are taken from SONADER 1/4 by reports except for the 3rd and 4th 1/4s of 1974, which are taken from Bogaerts tables. They are reasonably consistent with the annual total given by SONADER except where marked by asterisk.

BENIN

ANNEX I
Table 5

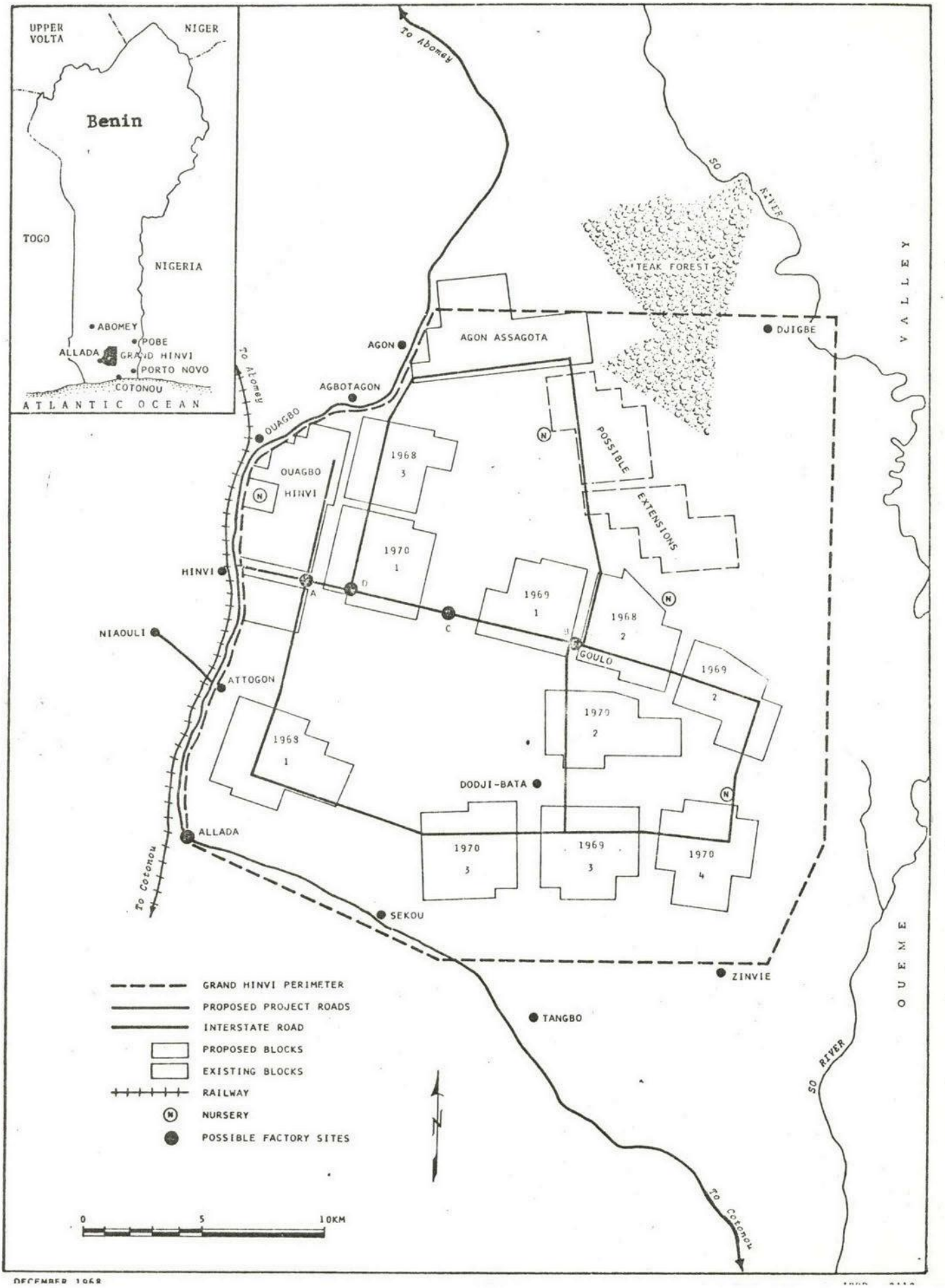
HINVI PROJECT

Table Yields of Fresh Fruit Bunches, Tons/ha

	64/5	65/6	66/7	67/8	68/9	69/70	70/1	71/2	72/3	73/4	74/5	75/
Hinvi	Planted											
Ovagbo		Planted							3.0	4.5	4.5	
Agon			Planted						2.4	4.5	4.2	
Assa-Gota			Planted							2.6	6.1	
Agbotagon				Planted						2.3	5.0	
Attogon				Planted						1.9	2.6	
Goulo				Planted						0.7	2.5	
Koundokpoe					Planted					2.3	1.9	
Sedje					Planted					0.2	1.9	
Dodji					Planted						1.1	
Sehe						Planted					0.6	
Hanafin						Planted						
Adjan						Planted						
Kpoe						Planted						

BENIN

HINVI AGRICULTURAL DEVELOPMENT PROJECT



DECEMBER 1968

CONFIDENTIEL

PROJET DE RAPPORT

BANQUE MONDIALE

Rapport d'évaluation rétrospective

BENIN - PROJET AGRICOLE DU GRAND HINVI

(Crédit 144-DA)

16 janvier 1978

Département de l'évaluation rétrospective des opérations
(OED)

Rapport d'évaluation rétrospective

BENIN - PROJET AGRICOLE DU GRAND HINVI

(Crédit 144-DA)

Table des Matières

Rapport d'évaluation rétrospective

BENIN - PROJET AGRICOLE DU GRAND HINVI

(Crédit 144-DA)

PREFACE

Ce rapport présente les résultats de l'évaluation rétrospective du Projet agricole du Grand Hinvi pour lequel la Banque Mondiale a accordé au Bénin un premier crédit de 4,6 millions de dollars (Crédit 144-DA) signé en mars 1969 et un crédit complémentaire de 600.000 dollars (Crédit 144-2DA), signé en mars 1974. Le Crédit 144-DA était entièrement déboursé dès juin 1976, quelques jours avant la date initialement prévue, et des options sont prises pour le déboursement des 25.000 dollars constituant le solde du Crédit complémentaire 144-2DA.

La rapport se compose d'un rapport d'achèvement du projet (RAP), préparé par le Bureau régional de l'Afrique de l'Afrique de l'Ouest en mars 1977 et d'un memorandum, préparé par le Département de l'évaluation rétrospective des opérations (OED). Ce mémorandum contient un résumé du RAP ainsi que des commentaires sur certaines de ses conclusions qui appellent une analyse plus détaillée.

L'évaluation rétrospective s'appuie sur le RAP, sur l'examen des dossiers disponibles à la Banque, sur des entretiens avec le personnel de la Banque connaissant bien le projet et sur les observations d'une mission de l'OED qui s'est rendue au Bénin en août 1977.

Les points examinés dans le mémorandum ont été retenus en raison, non seulement de leur importance pour le projet, mais aussi de leur pertinence pour trois autres projets récemment évalués par l'OED en Afrique

de l'Ouest: au Sénégal, un Projet de riziculture en Casamance; au Cameroun, le Projet Riz Semry; et en Sierra Leone, un Projet de développement agricole intégré. Les rapports consacrés à ces projets sont en cours de préparation.

Les auteurs du présent rapport tiennent à remercier le Gouvernement béninois et la Société nationale de développement rural (SONADER devenue SOBEPALH) qui était chargée de l'exécution du projet, pour l'esprit de coopération dont ils ont fait preuve à leur égard.

DONNEES DE BASE

BENIN - PROJET AGRICOLE DU GRAND HINVI (Crédit 144-DA)

A. Montants

	Original	Décaissé	Au 30 Juin 1977 Remboursé	Au 30 Juin 1977 En cours
Crédit 144-DA	4,6	4,6	-	4,6
Crédit 144-2 DA	0,6	0,575	-	0,575
Total	5,2	5,175	-	5,175

B. Données du Projet :

	Plan Initial	Révisions Juin 1971	Révisions Mars 1974	Réel
Première mention dans les dossiers de la Banque du Gouvernement				15 Février 65
Mission d'Evaluation				15 Janvier 67
Approbation du Conseil d'Administration				18 Février, 69
Accord de Crédit			22 Mars 1974	5 Mars 69
Entrée en vigueur du Crédit	5 Juin 69		20 Juin 1974	5 Août 69
Achèvement des Travaux	30 Juin 77			31 Décembre 75
Date de clôture du Crédit	30 Juin 76			11 Juin 76
Coût total du Projet	9,6 /	10,2	9,59	9,1
Taux de Rentabilité Economique	12 %			5%

C. Données sur les Missions

	Mois, Année	No. de jours	No. de personnes	No. de semaines	Date du rapport
Pre-préparation					Avril 1975
Préparation	Nov. Dec. 66				1er Juin 67
Pré-évaluation	Mars 67	6	4		
Evaluation	Juillet 67		3		
Réévaluation	Août 68		2		3 Février 69
Supervision I	Avril 69		1	1	26 Juin 69
Supervision II	Août 69	10	3	5	Manquant
Supervision III	Mars 70	11	3	5	18 Mai 70
Supervision IV	Août 70	14	1	2	30 Sept 70
Supervision V	Février 71	10	2	3	20 Avril 71
Supervision VI	Juin 71	12	3	6	28 Juin 71
Supervision VII	Janvier 72	11	1	2	7 Avril 72
Supervision VIII	Octobre 72	11	2	4	21 Nov. 72
Supervision IX	Juin 73	3	1	1	27 Juin 73
Supervision X	Septembre 73	5	2	2	28 Nov. 73
Supervision XI	Mai 74	7	1	1	5 Juin 74
Supervision XII	Février 75	11	2	3	27 Févr. 75
Total I				35	

Il n'y a pas de projet faisant suite.

D. Taux d'échange

US $ 1 = FCFA 247 (1969)
277 (Août 69)
256 (Avril 72)
215 (Nov. 73)

Rapport d'évaluation rétrospective

BENIN - PROJET AGRICOLE DU GRAND HINVI

(Crédit 144-DA)

I. RESUME DU RAPPORT D'ACHEVEMENT DU PROJET

Données générales

1. C'est la mission de coopération FAO/BIRD qui, en avril 1965, a évoqué pour la première fois la possibilité, pour la Banque, d'entreprendre l'aménagement de palmeraies au Bénin. Tout en étant intéressés par ce projet, les organismes européens d'aide financière, hésitaient à prendre en charge la totalité de son financement en devises. En 1966, la Banque aida la Société nationale de développement rural (SONADER)1/, société para-étatique entièrement administrée par des Africains, à préparer une proposition. Trois missions de la Banque devaient venir étudier le projet en 1967 et 1968 et l'Accord de crédit entrait en vigueur en août 1969.

2. Les contraintes pesant sur les éléments agricoles du projet, implanté dans la zone du Grand Hinvi à quelque 70 km au nord de Cotonou, furent identifiées dès le départ :

i) conditions climatiques marginales pour les dix blocs de 600 ha de palmeraies, ce qui permettait d'augurer de rendements inférieurs de 50 % à ceux des régions d'Afrique de l'Ouest les plus propices à cette culture; et

---

1/ La SONADER est devenue la SOBEPALH sans que ses attributions soient sensiblement modifiées.

ii) faibles rendements également probables sur les diverses parcelles composant les dix blocs de 600 ha de cultures annuelles, ce qui n'excluait pas une certaine concurrence entre la culture de ces parcelles et l'entretien des plantations des coopératives.

Malgré tous ces inconvénients, la conclusion du rapport d'évaluation était que le projet était justifié dans la mesure où à ce moment il n'existait pas dans le secteur agricole béninois de possibilités d'investissement plus prometteuses.

3. Le rapport d'évaluation ne s'écartait pas sensiblement du rapport de préévaluation. Il évoquait le niveau élevé de compétence du personnel de la SONADER et sa grande expérience de l'organisation de coopératives. Il réitérait certaines craintes quant à l'opportunité de la culture du palmier à huile, dans la région, compte tenu des conditions locales mais accordait moins de poids aux contraintes affectant la production de cultures annuelles; en fait, le revenu tiré de ces cultures devait représenter une part importante du revenu supplémentaire total prévu par le rapport et devait contribuer de façon appréciable au taux de rentabilité économique favorable du projet (12 %).

Le projet

4. Le projet prévoyait essentiellement : i) la plantation et l'entretien de 6.000 ha de palmeraies; ii) la préparation de 6.000 ha pour la production de cultures annuelles; et iii) la construction d'une huilerie d'une capacité annuelle finale de 70.000 tonnes de régimes. Il comprenait également des éléments de sylviculture, d'élevage, de stockage du maïs, de construction de routes et de locaux administratifs.

5. Les participants au projet devaient être groupés en dix coopératives de producteurs, dotées chacune de 600 ha de palmeraies et de 600 ha de cultures annuelles (ce dernier bloc étant subdivisé en parcelles individuelles de 1,5 ha). Pendant les 25 premières années, la SONADER devait promouvoir et diriger les activités des coopératives. Celles-ci devaient ensuite devenir locataires du terrain et propriétaires des aménagements apportés par le projet.

6. Le premier objectif visé était de mettre en place un système efficace de production agricole capable de remplacer le système de culture itinérante et d'élever le niveau de vie des paysans. Le projet devait permettre au Bénin de maintenir, voire d'accroître, le volume de ses exportations d'huile de palme. La valeur de l'accroissement de production était estimée à 1,3 million de dollars en 1975 et 2,4 millions de dollars en 1980 (prix de 1969).

7. Le coût du projet était estimé à 9,6 millions de dollars (soit 2,37 milliards de francs CFA) dont l'IDA devait financer 47,9 % (soit 4,6 millions de dollars), le FAC 47,9 % et l'Etat béninois 4,2 %.

8. L'exécution matérielle du projet devait être assumée directement par la SONADER. Pendant les 25 années de vie du projet, la SONADER devait gérer, au nom des coopératives, les palmeraies, les blocs de cultures annuelles et tous les éléments productifs du projet, à l'exception de l'huilerie qui devait être propriété de la SONADER. Cette dernière devait donc jouer deux rôles distincts : i) celui d'organisme de développement et ii) celui d'agent de gestion pour les coopératives.

9. La participation des agriculteurs au projet n'était pas entièrement volontaire, puisque la SONADER était habilitée à contraindre ceux qui étaient propriétaires dans les zones du projet à adhérer aux coopératives de producteurs et à leur affermer leurs terres. Les paysans pouvaient devenir membres des coopératives en leur louant leurs terres (membres détenteurs de parts "A"), en travaillant dans les palmeraies (membres détenteurs de parts "B") ou les deux. L'orginalité de ce système résidait dans la formation de coopératives de producteurs comprenant deux catégories de membres, étant entendu que seuls les membres de la catégorie B avaient le droit de voter sur les questions ayant trait à l'exploitatin de la coopérative. En cas de surplus, ils devaient recevoir sur les bénéfices réalisés un intérêt égal à 3 % de leur part.

Exécution du projet

10. Palmeraies. Le programme de plantations prit un bon départ et fut achevé dans les délais prévus. Un total de 6.075 ha de palmeraies furent correctement plantées et relativement bien entretenues malgré les difficultés majeures éprouvées à recruter la main-d'oeuvre nécessaire à ces opérations.

11. Zones de cultures annuelles. Le programme de cultures annuelles connut rapidement des difficultés. Le nombre d'agriculteurs disposés à abandonner les méthodes traditionnelles de culture itinérante sur des terrains déboisés pour prendre des parcelles de 1,5 ha sur les blocs du projet fut moins élevé qu'on ne l'avait escompté. Sur ces blocs de 600 ha, dits ZOCAs, l'utilisation des inputs resta minime et les rendements furent loin d'atteindre les objectifs prévus. En 1971, seuls 450 agriculteurs avaient pris des parcelles

dans une ZOCA. En 1971/72, la plus grande latitude laissée par la SONADER aux agriculteurs dans le choix de leurs assolements et l'introduction de la culture attelée éveillèrent l'intérêt des paysans. Grâce à une assistance technique financée par le FAC, la culture attelée se développa rapidement. Mais il semble que des contraintes pesant sur l'offre d'animaux limitent le développement de la culture à traction bovine, ce qui laisse planer une incertitude sur la mise en valeur ultérieure des ZOCAs.

12. Huilerie. Le projet initial prévoyait une huilerie d'une capacité de 24 tonnes/heure qui devait être construite en deux étapes. Le projet révisé (avril 1971), appelait la construction d'une huilerie de 20 tonnes/heure avec possibilité d'expansion à 40 tonnes/heure. La construction de l'huilerie fut terminée comme prévu en 1974 mais l'huilerie n'entra en service que vers le milieu de 1975 en raison de problèmes d'approvisionnement en eau. L'investissement s'élevait au total à 962,4 millions de francs CFA (3,9 millions de dollars) conformément aux estimations de 1971. Dans l'ensemble, cette huilerie fonctionne de façon satisfaisante, d'autant plus que certains aménagements effectués en 1977 ont permis de porter sa capacité à 27 tonnes/heure.

13. Coûts et financement. Le calendrier des coûts et du financement du projet a été révisé à deux reprises. En 1971, par suite des difficultés rencontrées avec les ZOCAs et de la nécessité de réaffecter la production des palmeraies entre les huileries existantes et prévues, il a fallu restructurer les coûts du projet. La Banque cessa alors de soutenir les ZOCAs, la SONADER

assurant la relève avec l'assistance technique du FAC, et les fonds ainsi libérés contribuèrent à financer les coûts supplémentaires de l'huilerie. Le coût total du projet augmenta de 26 % pour passer à 3,02 milliards de francs CFA.

14. En 1973, la SONADER dut faire face à une crise financière attribuable aux dévaluations successives du dollar et au fait que l'Etat n'avait pas versé sa contribution, et aggravée par le fait que la société n'avait pas mis en place de système de planification et de contrôle financier. Pour résoudre ces problèmes, l'IDA accorda au projet, en janvier 1974, un crédit complémentaire de 600.000 dollars, et le FAC versa une contribution supplémentaire de 520.000 dollars.

15. En fin de compte, les dépenses totales au titre du projet furent moins élevées qu'on ne l'avait prévu (2.266,6 millions de francs CFA). Le financement de l'IDA fut néanmoins augmenté, passant de 4,6 à 5,2 millions de dollars, soit un peu plus de 54 % de la facture totale; les pourcentages correspondants étaient de 43 % pour le FAC et 3 % pour l'Etat.

16. Ces coûts ont été déterminés à partir des dossiers de déboursement tenus par la SONADER. Pour certains types de dépenses, la faiblesse des procédures comptables de la SONADER fait que les coûts effectifs ne peuvent pas être énoncés avec certitude. Ce système comptable est cependant en voie d'amélioration. Il faut reconnaître que dans ce projet, les décaissements et les passations de marché ont été particulièrement compliqués par la répartition des paiements entre la Banque et le FAC.

Incidence du projet

17. Rendement et production des palmeraies. En dépit des excellents résultats donnés par les plantations et de leur entretien satisfaisant, la production est restée très inférieure aux estimations. La principale raison en est la faiblesse des précipitations. Sur la plupart des coopératives, pendant deux ans (1971/72 et 1972/73) les pluies n'ont même pas atteint le minimum enregistré au cours des 30 années précédentes et ont été très inégalement réparties sur des palmeraies pourtant voisines. La production a également été affectée par les incendies qui se sont propagés à partir des zones d'écobuage, et par le vol dû à la mauvaise organisation de la collecte des régimes et à la possibilité d'obtenir des prix plus élevés sur le marché parallèle.

18. Cultures annuelles. Avec l'introduction de la culture attelée, l'effectif total des exploitants des ZOCAs est passé d'environ 1.800 en 1973 à 3.000 en 1975, et le nombre de ceux qui utilisent du matériel à traction bovine a progressé de 352 à 880. Les rendements du maïs sont le double de ceux que permet la culture manuelle; en revanche, les rendements du coton restent marginaux.

19. Huilerie. L'huilerie fonctionne de façon satisfaisante malgré la persistance d'un certain nombre de difficultés : production de pointe plus élevée et plus concentrée que prévu, forte proportion de palmistes, capacité de stockage de l'huile insuffisante. La teneur en acides gras libres est beaucoup trop élevée (plus de 7 % au lieu des 4 % visés) du fait de la mauvaise organisation de la collecte des régimes et d'une capacité de stockage

trop faible. La SONADER prévoit d'accroître la capacité de l'huilerie de 27 à 40 tonnes/heure ce qui entraînerait un coût supplémentaire de 900 millions de francs CFA (4 millions de dollars aux prix de 1976).

20. SONADER. L'assistance de la Banque et du FAC a permis à la SONADER à surmonter la crise financière de 1973. Cette assistance a consisté essentiellement en une injection de fonds et en une réorganisation administrative visant à instaurer un contrôle plus étroit de l'exploitation des palmeraies et à guider plus efficacement les coopératives.

21. Coopératives. Les coopératives ont eu un démarrage difficile, en raison surtout de l'opposition initiale rencontrée de la part des agriculteurs possédant des terres. Les ouvriers des coopératives, ne se considérant pas comme propriétaires des palmeraies, responsables de leur réussite ou de leur échec, jugeaient la rémunération obtenue trop faible par rapport au travail fourni. Au prix de 5 francs CFA le kg de régime,1/ la marge brute d'autofinancement des coopératives n'est pas satisfaisante. Dans ces conditions, les coopératives ne seront jamais en mesure de rembourser leurs dettes comme le prévoit l'Accord de crédit. Le gouvernement a été invité à plusieurs reprises à relever ce prix mais aucune décision n'a encore été prise à ce sujet.

22. Taux de rentabilité. Pour recalculer le taux de rentabilité économique, le RAP fixe les salaires de manière à tenir compte des contraintes de main-d'oeuvre existant dans la région; aucune déduction n'a été prévue pour la

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1/ Depuis l'époque où le RAP est paru, ce prix a été porté à 5,6-5,9 francs CFA le kg.

production sacrifiée d'huile et de palmistes provenant des palmiers sauvages se trouvant sur les terres du projet, et l'on a prévu que la production des cultures annuelles se stabiliserait au niveau de 1975 sur les 1500 ha déjà cultivés. Dans diverses hypothèses de rendement futur des palmiers, le taux de rentabilité économique s'établit entre 0 % et 4,7 %.

Conclusions

23. Le projet a été étroitement suivi depuis son démarrage et l'IDA a su faire preuve de souplesse en 1971 et 1973 pour résoudre les problèmes rencontrés. Cependant, les résultats du projet dépendant maintenant des deux nouveaux problèmes concernant l'organisation et le financement des coopératives. Le premier a été précipité par la décision prise par les pouvoirs publics de confier toute la vulgarisation agricole à une organisation récemment constituée; la SONADER ne serait plus chargée que de la collecte et du traitement des fruits. Si cette décision est appliquée, elle signifiera l'abandon du concept d'intégration des différentes fonctions du projet en une seule organisation et de la supervision des coopératives par la SONADER. Le second problème provient de ce que les coopératives ne reçoivent qu'une faible part (37 % des recettes nettes) du revenu des palmeraies, ce qui ne peut que compromettre leur autonomie financière. Le gouvernement semble conscient des conséquences probables de ces divers problèmes. On peut s'attendre que ces questions soient de nouveau abordées puisque l'IDA a accepté d'examiner un second Projet Grand Hinvi comprenant notamment l'agrandissement de l'huilerie et le développement de la culture à traction bovine.

II. COMMENTAIRES DE L'OED

Aspects institutionnels

24. SONADER. L'une des caractéristiques originales du projet est qu'il a été préparé et exécuté par une société béninoise avec très peu d'assistance technique. La SONADER a rassemblé les données techniques sociales et économiques et préparé intégralement la demande du gouvernement. Elle a su gérer sainement à la fois le projet et les activités entreprises dans d'autres régions au titre d'autres programmes tout aussi ambitieux. Elle ne s'est pas seulement lancée dans un certain nombre d'activités nouvelles recommandées lors de l'évaluation (élevage, boisement, production d'huile de palme); elle a également su améliorer la situation des ZOCAs en y introduisant la traction animale, élément qui n'avait pas été discuté au stade de la planification. La SONADER a également innové en créant dans ses services sur le terrain une section féminine destinée en partie à rallier le soutien des ouvrières des plantations (par. 42). Les faiblesses qui avaient attiré l'attention lors de la supervision, en particulier la comptabilité, ont été corrigées, ou le sont actuellement et ne semblent plus affecter gravement les opérations de la société. En résumé, malgré ses faiblesses, la SONADER fait preuve d'une efficacité remarquable d'ailleurs reconnue non seulement par le gouvernement mais aussi par les banques commerciales.

25. Ce succès tient essentiellement aux raisons suivantes : i) la SONADER a toujours réussi, du fait de la réputation dont elle jouit, d'une

structure salariale qui récompense les bonnes performances, et de son implantation favorable dans le sud (non loin des principaux centres urbains) à attirer un personnel compétent et donc à constituer une équipe de direction efficace; ii) la SONADER jouit de l'autonomie en matière d'opérations et exécute ses programmes de développement selon les critères appliqués dans les affaires; iii) cette autonomie ne fait cependant pas de la SONADER un "corps étranger" puisqu'elle demeure le premier principal organe d'exécution de la politique de l'Etat et qu'elle est parfaitement intégrée dans le cadre institutionnel national; et iv) la SONADER a su coordonner efficacement ses différents domaines d'activités parce qu'ils étaient coiffés par un seul organisme.

26. OED a remarqué la capacité de la SONADER d'analyser ses problèmes et d'agir en conséquence, comme en témoignent l'introduction de la culture à traction bovine et la création d'une section d'ouvrières féminines. A cet égard, il convient de noter que la SONADER a réagi à cette expérience sans instituer de fonction officielle de contrôle et d'évaluation. Enfin, la SONADER sait déléguer l'autorité voulue à ses différentes sections et aux coopératives.1/

1/ Comme le souligne le RAP, ce réseau efficace de communications et de coordination risque d'être perdu si les nouveaux organismes récemment créés (CARDER : Centre d'appui régional pour le développement rural; SONACEB : Société nationale du commerce extérieur du Bénin; SODERA : Société de développement des ressources animales) commencent à assumer les fonctions qui leur ont été officiellement assignées. Le gouvernement a confirmé à la mission qu'il était conscient du danger qu'il y avait à répartir les activités de la SONADER entre ces nouveaux organismes.

27. L'expérience de la SONADER pose la question de savoir si la Banque ne devrait pas utiliser les services d'expatriés à titre consultatif seulement et laisser la gestion, pendant la phase initiale du projet, aux ressortissants du pays intéressé. D'une part, ce projet présentait des caractéristiques dont on pense habituellement qu'elles exigent une direction expatriée, de nombreux éléments impliquant une tâche complexe de coordination et d'autres, telles la création de plantations industrielles et l'exploitation d'importantes installations de traitement, exigeant une administration rigoureusement disciplinée. La SONADER a démontré que, pour difficiles qu'elles soient, ces tâches sont réalisables par des organismes locaux. En outre, le fait d'avoir une direction béninoise semble avoir facilité à la fois l'intégration du projet dans les programmes nationaux et son interaction avec les bénéficiaires potentiels. Par rapport à des projets gérés par des expatriés, ce sont là des avantages importants lorsque l'assistance financière extérieure prenant fin, il s'agit de maintenir les résultats du projet. D'autre part, le Bénin est connu pour être exceptionnellement bien doté en personnel de haut vol. De plus, la SONADER, qui avait accumulé dix années d'expérience lorsque le projet a démarré, était bien établie comme une entreprise digne de confiance, à laquelle le gouvernement était disposé à déléguer l'autorité nécessaire à un fonctionnement efficace. Il est donc difficile de déterminer dans quelle mesure l'expérience de la SONADER peut être répétée ailleurs. Même au Bénin, le succès de la SONADER semble exceptionnel : l' OED procède en effet actuellement à l'évaluation rétrospective du projet Zou-Borgou (culture du coton) dans le cadre duquel la SONACO, organe d'exécution semi-autonome, a réalisé une performance assez médiocre.

28. Les coopératives. Contrairement à ce qui se passe dans la plupart des pays d'Afrique, et malgré les réservations valables formulées dans le RAP (par. 4.33 à 4.36) les coopératives du projet semblent bien parties pour devenir des groupements d'exploitants efficaces, gérés dans une large mesure par leurs propres membres. Ce phénomène peut être attribué à divers facteurs :

a) la législation y afférente, qui n'imite pas les concepts occidentaux mais s'efforce de trouver des solutions originales, adaptées aux conditions locales. C'est ainsi qu'en établissant une distinction entre les membres détenteurs des parts "A" et "B" (par. 2.16 du RAP) cette législation a encouragé une réforme agraire d'un faible coût, tout en laissant aux travailleurs la direction des coopératives en dédommageant les propriétaires de terrains au moyen de parts plutôt que de versements en espèces (seuls les membres détenteurs de parts "B" ont droit de vote);

b) une gestion bien soutenue par la SONADER, qui aide efficacement les coopératives à recruter leur personnel et leur fournit une assistance technique et des facteurs de production. La direction de la SONADER voit maintenant son rôle comme celui d'une institution de soutien aux coopératives, ce qui est l'inverse de la relation initialement établie;

c) un système de rémunération équitable (salaires, dividendes) prévoyant d'accroître les sommes versées aux agriculteurs à

mesure que la coopérative se développe, et qui commence à satisfaire les attentes des membres des coopératives, soucieux de voir leur revenu augmenter en même temps qu'avance le projet;

d) un système de supervision efficace. Les comptes sont tenus par la SONADER mais font l'objet d'un double contrôle par i) un vérificateur comptable choisi par les membres de la coopérative, qui est généralement un fonctionnaire jugé digne de confiance et ii) un vérificateur d'Etat, envoyé par le Ministère du développement rural;

e) l'octroi dès le démarrage du projet, de pouvoirs effectifs au Conseil d'administration, qui organise les opérations au jour le jour de la coopérative et rémunère et supervise le personnel permanent; et

f) un contexte politique national favorable à la participation des exploitants aux organismes de développement agricole.

29. Le RAP ne fait pas mention d'un obstacle potentiel au développement régulier des coopératives : il s'agit du risque qu'une petite minorité de membres détenteurs de parts "B" prennent en main la direction des coopératives aux dépens de ceux qui, en fait, fournissent l'essentiel du travail. Dans l'une des coopératives visitées par la mission, on comptait 470 membres détenteurs de parts "A", 100 membres détenteurs de parts "B" et 300 ouvriers qui n'avaient pas accumulé en 4 ans les 200 journées nécessaires pour devenir membres détenteurs de parts "B". Dans une autre coopérative, la main-d'oeuvre était en 1976 répartie comme suit :

4 % travaillaient plus de 200 jours par an (ouvriers semi-permanents);

17 % travaillaient de 50 à 200 jours par an;

37 % travaillaient entre 10 et 49 jours par an;

42 % travaillaient moins de 10 jours par an.

Ainsi, moins d'un quart de la main-d'oeuvre atteint la moyenne de 50 hommes-journées par an nécessaire pour acquérir une part "B" en 4 ans. Les dix coopératives comptent 4.731 membres détenteurs de parts "A" et 1.218 membres détenteurs de parts "B". Ces chiffres sont à comparer avec le nombre d'agriculteurs possédant une parcelle dans les ZOCAs (RAP, par. 4.18), qui est évalué à 3.000. Le rapport n'indique pas comment ce groupe de 3.000 exploitants se répartit entre les catégories A et B, mais selon toute vraisemblance, un maximum de 40 % d'entre eux seulement sont détenteurs de parts "B". Comme seuls ces derniers sont légalement habilités à participer à la gestion des coopératives, ce groupe minoritaire pourrait, en théorie, agir à l'encontre des intérêts d'une large participation, principe qui est le fondement même des coopératives.

30. Jusqu'à présent, les ouvriers ne possédant pas de parts "B" sont tout de même autorisés à participer aux réunions des actionnaires. Ils reçoivent également des dividendes en proportion du travail fourni. Ainsi, le danger d'une prise de contrôle par les membres de la catégorie "B", qui sont en

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1/ Deux autres problèmes mentionnés dans le RAP sont, d'une part, la passation prévue des coopératives sous le contrôle d'un nouvel organisme d'Etat et, d'autre part, le faible niveau des prix payés par l'Etat pour les produits des coopératives.

minorité, ne semblent pas immédiat. Néanmoins, la législation pertinente devrait être modifiée afin de tenir compte de la situation réelle et d'autoriser officiellement la participation de tous les ouvriers, hommes et femmes (par exemple, par la création de parts spéciales).

31. En bref, la réussite du projet tient à la force de ses institutions. Dès le départ, c'est essentiellement le bon fonctionnement de la SONADER qui a décidé la Banque à participer au projet. Comme l'indiquait le RAP (par. 1.05) cette confiance initiale était justifiée. Aujourd'hui, le fait que la SONADER et les coopératives fonctionnent de façon satisfaisante laisse bien augurer de l'avenir du projet. Dans trois autres projets inspectés en Afrique de l'Ouest au même moment que celui-ci (voir la Préface), un projet de deuxième phase a été nécessaire, non seulement pour financer des investissements supplémentaires, mais aussi pour préserver les succès obtenus au cours de la première phase en assurant à l'organe d'exécution un complément d'aide en matière de gestion. Tel n'est pas le cas dans le projet du Grand Hinvi. Le fait que ce projet ait été exécuté par un organisme sain, doté d'un personnel entièrement béninois, permet d'envisager l'octroi de nouveaux fonds pour l'exécution de nouveaux programmes d'investissement.

Connaissance insuffisante des conditions locales

32. Main-d'oeuvre. Pour les plantations, la Banque a supposé que la main-d'oeuvre familiale du système traditionnel était en grande partie sous-employée et n'avait que de rares possibilités d'emploi à l'extérieur du projet. Aussi le projet initial prévoyait-il que les coopératives bénéficieraient d'un

apport de main-d'oeuvre régulier, chaque membre travaillant de 50 à 100 jours par an, une fois le projet bien lancé. Cette offre régulière de main-d'oeuvre devait jouer un rôle important pour le bon fonctionnement technique de la coopérative et l'intérêt et la fidélité de ses membres.

33. Ces hypothèses se sont révélées par trop optimistes. Une pénurie de main-d'oeuvre apparut dès le stade du défrichage, il fallut recruter de la main-d'oeuvre journalière, parfois à l'extérieur de la région. Même aujourd'hui, bien que dans l'ensemble le projet parvienne à recruter la main-d'oeuvre nécessaire à l'entretien des palmeraies et à la récolte, la répartition en est très inégale.

34. D'après une étude préparée en 1973 dans la vallée du Mono, où la SONADER exécute un projet similaire de culture du palmier, financé en partie par le FED, le temps consacré aux tâches agricoles a généralement été de l'ordre de 100 jours par an par personne active. Fournir aux coopératives 50 journées de travail supplémentaires représentait un accroissement considérable, compte tenu des autres possibilités de rémunération et obligations des agriculteurs vis-à-vis de la communauté. En fait, ce sont principalement les jeunes sans charges familiales qui ont travaillé plus de 50 jours par an sur les plantations. Les autres ne l'ont fait que lorsqu'aucun autre emploi ne s'offrait à eux. Ceci ne s'est produit qu'en de rares occasions, comme il ressort des chiffres indiqués au par. 29. Les difficultés rencontrées au début du projet en ce qui concerne l'entretien des palmeraies sont imputables essentiellement à cette pénurie de main-d'oeuvre.

Si elle n'est pas devenue un problème majeur, c'est surtout que les coopératives ont accepté en qualité de membres à part entière des ouvriers ne travaillant qu'irrégulièrement sur les plantations, ce qui n'était pas prévu par la législation initiale (par. 30).

35. Les zones de cultures annuelles (ZOCAs). Le nouveau système agricole permanent mis au point dans un centre de recherche local, alors géré par des techniciens français, prévoyait la rotation des cultures et des méthodes culturales intensives. Ce système devait être rigoureusement observé pour donner les résultats qui auraient affirmé sa supériorité sur l'ancien système de culture itinérante. Ce nouveau système avait déjà été introduit sans grand succès; d'ailleurs, toutes les expériences antérieures auxquelles la SONADER s'était livrée avaient échoué. Néanmoins, à l'évaluation, tous les organismes concernés estimaient que ce nouveau système était supérieur à la culture itinérante traditionnelle et que les agriculteurs devaient l'adopter.

36. Dès le début, ce système fut mal accueilli par les paysans du Grand Hinvi, qui comme l'indique le RAP (par. 4.15), préféraient leur méthode traditionnelle à la routine intensive prévue par le projet. Il semblerait que ce nouveau système n'ait pas répondu à tous les besoins des agriculteurs : la partie consacrée aux cultures vivrières était insuffisante, les rendements des cultures commerciales (arachides, coton) étaient faibles et la rotation prévue entraîna de graves contraintes de main-d'oeuvre au moment de la plantation et de la récolte. L'assolement retenu étant rigide et pratiquement obligatoire, il n'est pas surprenant que les premières années, les agriculteurs soient restés à l'écart des ZOCAs ou les aient abandonnées, préférant pratiquer leurs

cultures à l'extérieur de la zone du projet. La Banque, tout comme le FAC et la SONADER, semble avoir gravement surestimé les avantages que les exploitants pouvaient retirer du nouveau système. En égard aux contraintes de main-d'oeuvre, les trois organismes ont évalué ce système en fonction, non pas des rendements à l'hectare - alors que sur ce point il est indiscutablement supérieur au système traditionnel - mais des rendements par jour de travail - alors que, sur ce plan, sa supériorité n'est pas évidente et, dans le meilleur des cas, était sans doute minime.

37. Par la suite, un certain assouplissement de l'assolement imposé et l'introduction de la culture à traction bovine devaient entraîner un changement radical de la situation. L'utilisation de la traction animale permet de pratiquement doubler les rendements des principales cultures tout en réduisant le nombre de jours de travail nécessaire par hectare pendant les périodes critiques de la plantation et du désherbage.

38. Le RAP note à juste titre que le développement de la traction attelée se heurte à un certain nombre d'obstacles, notamment la difficulté qu'il y a à trouver des boeufs adaptés aux conditions locales et les contraintes financières qui empêchent les exploitants d'en acquérir. Le coût d'une paire de boeufs, ajouté aux risques inhérents à cet achat (mort des animaux, difficulté de remboursement les années de faibles précipitations) et au surcroît de travail qu'entraînent les soins à leur prodiguer, ont convaincu les petits et moyens exploitants de louer ces animaux. Ce système laisse le risque et la mise de fonds initiale (mais également le profit) aux gros exploitants. Sans

aide financière aux petits et moyens agriculteurs, l'introduction de la traction attelée ne peut qu'accentuer l'inégalité sociale. Aussi la Banque a-t-elle peut-être commis une erreur en refusant d'aider la SONADER avec les ZOCAs au moment précis où une solution semblait se profiler. En 1971, lors de l'examen du projet, le FAC a intensifié son assistance technique aux ZOCAs en vue de développer la traction attelée tandis que la Banque réduisait le financement accordé à cet élément du projet. (Le RAP propose qu'un nouveau crédit de l'IDA soit accordé à la SONADER pour développer la culture à traction bovine).

39. La percée attribuable à l'introduction de la culture à traction bovine n'a manifestement pas résolu tous les problèmes et d'autres facteurs continuent à exercer un effet négatif sur l'activité prévue dans les ZOCAs. La mission a constaté que :

i) La rotation des cultures a été pratiquement abandonnée. Le maïs représente environ 80 % des superficies de culture à traction bovine et 90 % des superficies de culture manuelle. Cette monoculture, qui s'explique par la forte amélioration du marché du maïs au Bénin et au Nigéria, menace toutefois d'épuiser le sol;

ii) La consommation d'engrais reste très limitée (4,5 tonnes au total en 1976 au lieu des 8 tonnes prévues lors de l'évaluation, une forte baisse ayant été constatée depuis la hausse des prix de 1974);

iii) La combinaison des facteurs i) et ii) représente une grave menace de dégradation des sols. C'est là une des raisons pour lesquelles 50 % seulement des superficies disponibles sont utilisés; les exploitants préfèrent

laisser en friche la terre qu'ils estiment partiellement épuisée, conformément à leur système traditionnel de culture itinérante. Ainsi, il est peu probable que la culture à traction bovine parvienne à instaurer un nouvel équilibre agricole tant que le problème posé par le maintien de la fertilité des sols n'aura pas été résolu.

40. Rôle et attitude des femmes dans le projet. Au cours de la préparation du projet, on ne s'est pas soucié spécifiquement des femmes, bien que l'on sache qu'elles jouent un rôle clé dans la production vivrière, dans le traitement des fruits des palmiers sauvages et dans la commercialisation de l'huile et du maïs. Le projet n'a pas encore rallié tous les suffrages féminins : il a en effet éliminé une bonne partie du revenu annuel que les paysannes tirent du traitement et de la commercialisation des produits, perte qui n'a été que partiellement compensée par la possibilité d'obtenir un travail rémunérateur dans la coopérative. La participation féminine aux coopératives reste limitée : les détentrices de parts "A" ou "B" sont encore très rares. Néanmoins, elles ont joué un rôle important, en particulier dans les tâches demandant une précision méticuleuse (préparation des pépinières et plantation des couvertures de légumineuses). En 1973, la SONADER a recruté des femmes pour créer une section féminine chargée d'un programme d'économie ménagère et d'enseignement des nouvelles techniques culturales. Un certain nombre d'autres mesures (participation aux structures coopératives, création de magasins pour les approvisionnements de base, etc.) pourraient sans aucun doute assurer au projet le soutien de l'élément féminin, d'autant plus essentiel à sa

réussite durable que les femmes peuvent ruiner l'entreprise. Elles peuvent par exemple protester en traitant elles-mêmes plus de fruits au lieu de les faire livrer à l'huilerie (RAP, par. 4.10).

41. Dans la première phase du projet, le manque d'attention porté par la Banque aux paysannes s'explique peut-être par un optimisme excessif quant aux disponibilités en main-d'oeuvre, qui ne laissait pas prévoir que le projet dépendrait à ce point de la participation féminine. Cependant, la pénurie de main-d'oeuvre apparue et le nombre important des ouvrières travaillant dans les pépinières auraient dû rendre la Banque plus consciente du rôle particulier joué par les femmes dans un projet conçu principalement pour des hommes. Le chef de la section féminine de la SONADER a fait remarquer que la mission d'évaluation rétrospective était la première mission de la Banque ayant demandé à la rencontrer.

Incidence de la politique de prix du gouvernement sur le projet

42. Malgré l'augmentation récente des prix à la production des fruits du palmier, qui sont passés de 4,6-4,9 francs CFA le kg à 5,6-5,9 francs CFA le kg, le marché parallèle reste plus intéressant pour les planteurs et le problème du vol continue de préoccuper les autorités responsables du projet. Apparemment, il est plus rémunérateur pour les exploitants de traiter le fruit eux-mêmes que de le livrer à l'huilerie. Celle-ci, qui fonctionne déjà en-dessous de sa capacité, a traité un volume de fruits encore réduit en 1977.

43. Aux prix courants, les coopératives peuvent couvrir leurs charges d'exploitation mais un rendement moyen d'au moins six tonnes/ha est nécessaire pour leur permettre de rembourser leurs prêts à 25 ans et de rémunérer leur

main-d'oeuvre équitablement. Avec un rendement de 5 tonnes, comme celui de ces dernières années, les coopératives ne pourront rembourser ni les prêts à long terme qu'elles ont dû contracter pour financer les investissements du projet, ni les prêts à court terme qui leur ont été consentis par la SONADER sous forme d'avances de trésorerie. Il ne s'agit pas là d'une insuffisance des coopératives, qui fonctionnent efficacement et auraient beaucoup de peine à réduire leurs coûts de production.

44. Eu égard aux problèmes budgétaires auxquels il se trouve confronté, on peut comprendre que le Gouvernement béninois souhaite maintenir le prix à la production à un niveau aussi faible que possible. Il est donc autorisé à utiliser les revenus dégagés par ce projet au profit d'autres régions moins favorisées. Cependant, les fonds que le gouvernement pourrait distribuer aux agriculteurs du Grand Hinvi par le truchement d'un relèvement des prix au producteur lui reviendraient en partie sous forme de remboursement de prêts. De même, les huileries fonctionnant en-dessous de leur capacité, leurs charges fixes unitaires sont excessives. Elles pourraient être réduites, et les recettes moyennes de l'Etat par tonne d'huile pourraient être accrues par un relèvement des prix aux producteurs. La mise de fonds qu'entrainerait une telle mesure ne serait que provisoire et serait récupérée à long terme par l'Etat. Elle aurait également pour effet de renforcer les coopératives qui pourraient ainsi jouer un rôle plus important dans le développement. Pour toutes ces raisons, la Banque a demandé au Gouvernement de réviser sa politique de prix. Il semble urgent, en effet, d'aligner la rémunération de la production en agriculture sur les conditions du marché, soit en relevant le prix lui-même, soit en prenant des dispositions pour que les coopératives puissent recevoir une

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part des bénéfices de l'huilerie.1/ L'OED reprend à son compte les critiques du RAP qui reproche au gouvernement de ne pas avoir accordé à cette question toute l'attention qu'elle mérite.

Taux de rentabilité économique

45. La mission de préévaluation a pesé les risques du projet et en a conclu que, même si le taux de rentabilité économique devait être, au mieux, marginal, le projet était justifié pour d'autres raisons, notamment son solide fondement institutionnel et l'absence d'autres possibilités d'investissement dans le secteur agricole du Bénin.

46. Si le rapport d'évaluation réitérait les avertissements lancés par la mission précédente, l'analyse quantitative dressait de la situation un tableau plus optimiste. La valeur des différentes productions, telle que l'envisageaient ces deux missions et telle que l'avait initialement proposée la SONADER, se présentait comme suit :

Revenu annuel brut d'exploitation	Estimation de la SONADER	Estimation de la mission de préévaluation	Estimation de la mission d'évaluation
	(millions de francs CFA)		
Huile de palme	486	424	340
Palmistes	115	65	49
Cultures annuelles	139	46	250
Total	740	535	639

1/ Il était initialement prévu de regrouper les coopératives en une union qui devait ultérieurement prendre la responsabilité de l'huilerie. Si cette idée est abandonnée, la question de la répartition du surplus de l'huilerie, après remboursment normal des prêts, reste encore à régler.

Le rôle important assigné aux cultures annuelles lors de l'évaluation ne se retrouve pas dans les propositions antérieures. Les expériences précédentes de la SONADER en matière de cultures annuelles ayant échoué, la confiance exprimée dans la réussite de cet élément par la mission d'évaluation ne semble pas justifiée. Au contraire, de nombreux signes indiquaient qu'elle était trop optimiste. En surestimant l'élément "cultures annuelles", la Banque s'efforçait en vain de donner à cette proposition une meilleure justification économique et ce, bien que la Banque sût que le projet était fondé pour des raisons autres que son incidence économique.

47. L'estimation du taux de rentabilité, importante à l'époque de l'évaluation, semble avoir été ignorée pendant l'exécution du projet. Lorsqu'après la crise traversée par la SONADER en 1971, la Banque a révisé les coûts du projet, elle a réduit les montants attribués aux ZOCAs et relevé ceux de l'huilerie (RAP, par. 3.09). Contrairement à la position adoptée par le gouvernement et le FAC, la Banque n'a pas jugé bon d'aider au développement de la culture à traction bovine, qui apparaissait alors comme le seul moyen reconnu de sauver la stratégie des ZOCAs. Ce faisant, la Banque s'écartait de l'analyse de sa mission d'évaluation puisque les cultures annuelles devaient fournir 40 % des recettes du projet (voir tableau ci-dessus). L'abandon des ZOCAs par la Banque aurait pu faire tomber le taux de rentabilité du projet en-dessous zéro. Cependant, les documents de la Banque n'indiquent pas que la décision de réduire les efforts déployés en faveur des ZOCAs ait été prise sur la base d'une analyse de son incidence sur le taux de rentabilité. Le taux de

rentabilité n'y est plus présenté comme un outil de prise de décision, même au moment où d'importantes modifications des éléments du projet étaient envisagées. Il faut se féliciter que le FAC ait continué à promouvoir le développement de la culture à traction bovine, car l'élément "cultures annuelles" a été essentiel dans le maintien d'un taux de rentabilité positif. Les autorités de la SONADER estiment que la Banque a eu tort d'abandonner à son sort l'élément "cultures annuelles".

48. Les hypothèses irréalistes qui avaient été retenues précédemment pour le calcul du taux de rentabilité ont été corrigées dans le RAP. Les estimations des rendements ont été réduites afin de tenir compte de l'éventualité de faibles précipitations, on a supposé que les superficies cultivées dans les ZOCAs restaient les mêmes et les coûts de main-d'oeuvre ont été fixés à peu près aux prix du marché. L'OED n'a rien à redire au calcul du taux de rentabilité présenté dans le RAP et souscrit à sa conclusion selon laquelle le programme de développement de la SONADER mérite de continuer à recevoir l'assistance de la Banque malgré le faible taux de rentabilité obtenu jusqu'ici. Pour les raisons esquissées dans le rapport de préévaluation (RAP, par. 1.04), un taux aussi bas ne signifie pas que l'investissement n'aurait pas dû être entrepris.

III. CONCLUSIONS

49. Sur la base de la rentabilité économique, le projet supporte mal la comparaison avec les prévisions établies lors de l'évaluation. La nouvelle estimation du taux de rentabilité atteint au maximum 5 %, pourcentage bien inférieur aux 12 % prévus par la mission d'évaluation. La production a indiscustablement souffert de la médiocrité des précipitations pendant la période considérée. Cependant, même avec des rendements du palmier égaux aux estimations de l'évaluation initiale, le projet ne pourrait pas réaliser le taux de rentabilité escompté, la production de cultures annuelles étant bien inférieure aux prévisions. Ce résultat s'explique par un certain nombre de raisons qui n'ont pas grand chose à voir avec les conditions climatiques et qui auraient pu être prévues lors de l'évaluation. Si le cadre général du projet avait fait alors l'objet d'une analyse plus approfondie et si les chiffres utilisés lors de l'évaluation avaient mieux tenu compte des incertitudes exprimées dans le rapport, le taux de rentabilité prévu aurait été plus réaliste et le résultat final n'aurait pas été décevant.

50. En tout état de cause, la mission d'évaluation rétrospective considère que les aspects économiques de ce projet sont bien moins intéressants que ses aspects institutionnels. Les institutions mises sur pied se sont avérées efficaces et peuvent beaucoup s'améliorer pour elles-mêmes. La SONADER est remarquable en ce sens qu'elle est entièrement gérée par des Béninois qui n'ont besoin que d'une assistance technique minime pour mener à bien, dans les délais prévus, leur programme de développement. Les coopératives présentent

des caractéristiques intéressantes et fournissent un exemple rare de réussite d'une organisation communautaire rurale dans le cadre d'un projet de la Banque. L'aptitude de la SONADER et des coopératives à poursuivre leur développement dépendra du soutien dont elles bénéficieront de la part de l'Etat sous forme d'une intégration continue des activités actuellement coiffées par la seule SONADER, de prix équitables pour les produits des coopératives, et d'une adaptation de la législation régissant les coopératives aux besoins nouveaux apparus depuis leur création. Néanmoins, la performance de la SONADER et des coopératives, satisfaisante jusqu'à présent, permet à l'OED d'avoir confiance en l'avenir du Grand Hinvi plus que dans celui des trois autres projets analysés au même moment (voir Préface) en particulier pour la période qui suivra l'interruption de l'aide de la Banque, en l'absence de projets de deuxième phase.

51. La Banque n'a examiné la situation des exploitations que de façon superficielle. Les avantages que les exploitants retiraient de leur système cultural traditionnel et la façon dont ils perçoivent ces avantages ont été sous-estimés, tandis que l'on surestimait les avantages potentiels du nouveau programme de cultures annuelles. De même, la Banque a nettement surestimé les disponibilités en main-d'oeuvre agricole. L'hypothèse couramment retenue lors de l'évaluation des projets de petites plantations de la Banque, à savoir que le coût d'opportunité de la main-d'oeuvre familiale des petits planteurs est nul, n'est vérifiée dans aucun des quatre projets inspectés. Aussi la probabilité que les exploitants participent aux projets doit-elle être mesurée en fonction des rendements par homme-journée au moins autant sinon plus que des

rendements à l'hectare. En outre, une étude détaillée des goulets d'étranglement au niveau de l'offre de main-d'oeuvre saisonnière et du rôle des femmes et des membres les plus jeunes de la famille, qui constituent une fraction importante de la main-d'oeuvre disponible, semble justifiée dès le stade de l'évaluation et pendant l'exécution du projet, ou pourrait ainsi déterminer les contraintes qui risquent de les empêcher de participer au projet ou du moins d'y donner leur pleine mesure.

BENIN

PROJET AGRICOLE DU GRAND HINVI

(CREDIT 144 DA)

RAPPORT D'ACHEVEMENT DU PROJET

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RAPPORT D'ACHEVEMENT DU PROJET

BENIN - PROJET AGRICOLE DU GRAND HINVI
(Crédit 144-DA)

I. GENERALITES, PREPARATION ET EVALUATION

1.01 La participation éventuelle de la Banque à un projet de plantation de palmiers à huile au Bénin a été étudiée par une mission du programme de coopération de la FAO et de la BIRD dans un rapport d'avril 1965. Ce rapport concluait que le programme en cours d'exécution prévoyant la plantation de 2500 hectares de palmiers à huile par an serait vraisemblablement financé par le FAC et le FED, au moins jusqu'en 1968 et que la Banque ne pouvait donc pas y participer dans l'immédiat. Le rapport du programme de coopération précisait toutefois que la production issue du projet en cours ne remplirait pas les conditions requises de l'huile de palme destinée à l'exportation. En 1966, le FAC et le FED semblant de moins en moins disposés à assumer à eux seuls le financement extérieur du projet proposé, les autorités béninoises demandèrent à la Banque de leur venir en aide. PMWA participa alors, avec la SONADER à la préparation d'un projet pendant les derniers mois de 1966. Une mission de pré-évaluation se rendit au Dahomey en mars 1967, suivie d'une mission d'évaluation en juillet 1967; puis d'une mission de réévaluation en août 1968; l'accord de crédit entra en vigueur en août 1969.

1.02 Il fut évident, dès le départ, que les éléments agricoles du projet, c'est-à-dire la plantation de palmiers à huile sur dix parcelles d'environ 600 ha chacune appartenant à une coopérative, et la plantation de cultures vivrières annuelles sur les terrains appartenant aux fermiers ou aux membres des coopératives, seraient assujettis à un certain nombre de contraintes. Par exemple, le rapport de pré-évaluation précisait "les conditions de culture des palmiers à l'huile sont marginales et les rendements ne devraient pas dépasser 50 pour cent de ceux qu'on enregistre dans les régions les plus favorables de l'Afrique occidentale" (PAR par. 2.07 du rapport d'évaluation). En outre, l'incorporation de cultures vivrières et de petites fermes dans des plantations de palmiers à huile avait fait l'objet d'expériences négatives, mais l'on estimait que les difficultés avaient été résolues (PAR par. 2.10-2.12. Voir note en bas de page).

1.03 En ce qui concerne les cultures vivrières annuelles on craignait que la structure coopérative proposée n'ait pour conséquence que les fermiers membres de coopératives ne négligent soit les cultures

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Note : Dans le présent document nous utiliserons les sigles suivants :

PAR : Rapport de pré-évaluation, du 1er juin 1967. Memorandum de Rowe, Vigie, Bishop et von Czernicki à Evans.

P-670 : Rapport et recommandations du Président, du 5 février 1969.

AR : Rapport d'évaluation. Rapport sur le projet de développement agricole de Hinvi, TO-615b, du 3 février 1969.

SMR : Rapport de la mission de supervision.

annuelles soit les palmiers à huile, et bien que cette structure ait été étudiée avec beaucoup de soin, "seul le temps permettrait de juger son efficacité" (PAR par. 3.20).

1.04 Malgré ces réserves, le rapport de pré-évaluation concluait qu'il n'y avait pas "dans le secteur agricole d'autres possibilités d'investissement qui offrent des perspectives plus favorables que ce projet", (PAR par. 5.01). Si la mission d'évaluation pouvait s'assurer que les membres des coopératives "pourraient produire autant dans les régions de cultures annuelles qu'ils le pouvaient sans le projet" et que le projet pouvait accroître la productivité, ledit projet serait favorablement jugé économiquement viable (PAR par. 5.03). L'intervalle de 19 mois entre la première mission d'évaluation et la publication du rapport d'évaluation est "dû à la période d'instabilité politique consécutive au changement de gouvernement en décembre 1967, et à la situation financière précaire au Bénin, qui a empêché le FAC et l'IDA de poursuivre la préparation du projet jusqu'à la fin de l'été de 1968 (P-670, 5/2/69).

1.05 Le rapport d'évaluation ne différait pas sensiblement du rapport de pré-évaluation quant à l'évaluation générale de la situation. Il confirmait à la fois que la région ne semblait pas se prêter particulièrement à la culture du palmier à huile (AR par. 3.02), et corroborait l'opinion exprimé dans le rapport de pré-évaluation sur l'aptitude de la SONADER à exécuter le projet. "La SONADER est entièrement africanisée et fait preuve d'une grande compétence tant à son siège que sur le terrain. Elle est efficace et a acquis une grande expérience en matière à la fois de développement agricole et d'organisation et de gestion de coopératives de producteurs. La SONADER est capable de mettre en oeuvre un programme élargi comprenant le projet proposé. Le succès continu des opérations de la SONADER est subordonné au maintien de la qualité de ses cadres" (AR par. 6.02). Comme on le verra, cette confiance réconfortante et assez rare dans l'aptitude d'une institution à exécuter un projet de développement était, dans l'ensemble très justifiée.

1.06 Il est regrettable que le rapport d'évaluation n'ait abordé qu'assez brièvement la question des facteurs qui limitent la production des cultures annuelles. Dans le rapport de ré-évaluation, cette question était jugée de première importance; le revenu tiré des cultures annuelles est, en effet, un élément important du revenu total et de l'évaluation favorable du projet. En l'occurrence le rendement relativement faible de ces cultures a presque entraîné l'échec du projet en cours d'exécution. Il est donc fâcheux que l'on n'ait pas accordé plus d'importance à cette question au moment de l'évaluation du projet.

II. LE PROJET

A. Description et objectifs du projet

2.01 Le rapport d'évaluation résume ainsi les principaux objectifs du projet :

- créer et amener à maturité une plantation de palmiers à huile d'une superficie de 6000 hectares;
- préparer 6000 hectares en vue de la production de cultures annuelles;
- construire une huilerie dont la capacité annuelle finale sera de 70.000 tonnes de régimes de fruits frais;
- planter 1000 hectares de cassiers et de tecks;
- acheter 310 têtes de bétail pour le développement de la production de viande;
- construire, pour l'entreposage du maïs, des silos dont la capacité finale sera de 3000 tonnes;
- construire les routes et les installations communes nécessaires au fonctionnement du projet.

La mise en oeuvre du projet et sa production ultérieure devaient être organisées par l'intermédiaire de dix unités coopératives, chargées chacune de 600 hectares de palmeraie et de 600 hectares de cultures annuelles. Pendant les 25 premières années de mise en oeuvre et de fonctionnement du projet, la Société Nationale de Développement Rural (SONADER) doit être entièrement responsable de la gestion du projet, et diriger les activités coopératives. Les dix unités coopératives devraient ensuite devenir locataires de la terre et propriétaires des installations énumérées plus haut. La SONADER devra assurer la formation professionnelle du personnel qu'exige le fonctionnement des unités coopératives, et le rémunérer pendant toute la période de mise en oeuvre du projet.

2.02 Le principal objectif du projet est de mettre en place un système de culture moderne et efficace capable d'assurer aux agriculteurs qui y participeront un niveau de vie supérieur à celui que permettent d'obtenir les méthodes de cultures traditionnelles. Ce faisant, le projet devra accroître la production, et tout en augmentant initialement, maintenir les exportations de produits de l'huile de palme en provenance du Bénin.

2.03 La production supplémentaire qu'engendrerait le projet était estimée, annuellement, aux quantités suivantes :

	en 1975	A la maturité des palmiers (1980)
Huile de palme (tonnes)	4.275	10.080
Palmistes (tonnes)	1.395	2.400
Maïs (tonnes)	6.535	8.739*
Arachides (tonnes)	1.582	1.920*
Coton graine (tonnes)	1.338	1.600
Bétail (têtes, adultes)	60	62*
Teak (nombre d'arbres)		70.000 (environ)

* On prévoyait que la production annuelle de ces cultures augmenterait légèrement au cours des années suivantes et atteindrait 385.000 unités pendant la période 1980-84.

La valeur annuelle de la production supplémentaire était estimée à 1,3 million de dollars EU en 1975 et à 2,4 millions de dollars EU en 1980 (aux prix de 1969).

B. Coût et financement du projet

2.04 Les estimations du coût du projet sont résumées au tableau ci-après :

Estimations initiales du coût du projet

	Coût en monnaie locale			$EU		
	Monnaie locale	Devises	Coût total	Monnaie locale	Devises	Coût total
	---Millions de FCFA----			---Milliers de FCFA----		
Etudes	8	32	40	32	130	162
Plantation de palmiers à huile	708	237	945	2.870	956	3.826
Huilerie	64	492	556	255	1.992	2.247
Plantation des cultures annuelles	165	32	197	668	129	797
Bétail	34	3	37	138	12	150
Plantation d'arbres	25	4	29	101	16	117
Personnel et formation professionnelle	36	4	40	146	16	162
Villages, routes, véhicules, etc.	75	119	194	304	481	785
Silos à maïs	4	36	40	16	146	162
Frais généraux et entretien	80	44	124	324	178	502
Imprévus	84	84	168	340	340	680
Total	1.283	1.087	2.370	5.194	4.396	9.590

2.05 Comme l'indique le plan de financement convenu, ci-après, le Fonds (français) d'aide et de coopération a participé au financement du projet :

Plan de financement

Source	Devises	Monnaie locale	Financement total	Pourcentage
	---Millions de $EU---			
IDA	2,8	1,8	4,6	47,9
FAC	1,6	3,0	4,6	47,9
Gouvernement du Bénin	-	0,4	0,4	4,2
Total	4,4	5,2	9,6	100,0

2.06 Ainsi que l'explique "Rapport et recommandations" du Président, l'accord de financement conclu avec le FAC prévoit que "le montant des fonds provenant de l'IDA (était) à peu près équivalent au coût en devises de l'ensemble du projet" (P-670, par. 11). La part importante du financement extérieur dans le total s'explique par le fait que le Bénin se trouvait à l'époque dans une situation financière difficile; qu'il dépendait de la France pour une large part du financement de son budget courant; et que l'on ne pouvait pas s'attendre à ce qu'il supporte une fraction substantielle de ses dépenses de développement.

2.07 Il avait été proposé que le financement fourni par l'IDA et le FAC soit en partie parallèle, et en partie conjoint. Tous les biens et services financés en totalité par l'IDA et dont la valeur était évaluée à 2,7 millions de dollars EU - ainsi que tous les biens et services dont le financement était assuré conjointement par l'IDA et le FAC - évalués à 5,8 millions de dollars EU - feraient l'objet d'appels d'offres internationaux, sauf pour les contrats dont la valeur est égale ou inférieure à 50.000 dollars, qui seraient accordés sur la base d'appels d'offres lancés dans le pays selon des procédures jugées acceptables par l'IDA. Les biens et services financés entièrement par le FAC, dont la valeur est évaluée à 0,7 million de dollars EU seraient achetés au sein de la zone franc, conformément aux procédures habituelles du FAC". (P-670, par. 12).

2.08 Les dispositions financières intérieures seraient les suivantes: le Gouvernement du Bénin a) reprêterait les crédits qu'il obtiendrait de l'IDA à la SONADER pour une durée de 25 ans y compris un différé d'amortissement de 9 ans, et en recevrait un intérêt de 6 %; b) reprêterait les fonds qu'il recevrait du FAC à la SONADER, pendant 31 ans, à des taux d'intérêt qui s'échelonneraient entre 0,75 % et 2,5 %; ces fonds seraient remboursés à un Fonds béninois de renouvellement de la palmeraie, établi à la demande expresse du FAC pour le financement d'un programme continu de plantation de palmiers à huile. Le gouvernement contribuerait au projet en remboursant à la SONADER la composante "impôts et droits" des marchandises achetées par la SONADER au Bénin. Les importations directes seraient exemptées de droits d'entrée.

C. Organisation et gestion

2.09 L'organisation du projet est répartie entre deux éléments principaux qui sont a) la SONADER, responsable de la gestion de l'ensemble du projet et des affaires de l'élément "coopératives"; b) dix coopératives de producteurs qui devraient comprendre au total 4.000 familles d'agriculteurs exploitant chacune 1,5 hectare de palmeraie et 1,5 hectare de cultures annuelles (par. 2.15).

2.10 SONADER. Comme son nom l'indique, la SONADER est, de par ses statuts, en grande partie chargée du développement rural; en pratique, toutefois, au moment où le projet était en cours de discussion, ses

fonctions se limitaient à encourager le développement de palmeraies, ainsi que, dans une moindre mesure, des cultures vivrières dans les régions plantées de palmiers à huile.

Pendant la formulation du projet, il a également été décidé que la SONADER serait propriétaire de l'huilerie dont on prévoyait la construction ultérieure, et qu'elle en assurait la gestion , et ce en raison des insuffisances évidentes de la SNAHDA, organisation qui était chargée de la gestion des quatre huileries alors en activité. Pendant l'élaboration du projet, la SONADER a été également chargée de développer toutes les activités rurales dans la vallée de la rivière Mono; toutefois, ces attributions additionnelles n'ont été rendues publiques par la Banque et le FAC que peu avant l'entrée en vigueur du prêt. La première mission de supervision a estimé que "Ces fonctions supplémentaires ne pouvaient être remplies sans que le déroulement de celles que remplissait d'ores et déjà la SONADER en souffre". (SMR, 26/6/69, par. 7). C'est la seule réserve (outre les doutes exprimés quant à l'aptitude de la SONADER à tenir une comptabilité de façon adéquate) exprimée sur la compétence de la SONADER en ce qui concerne l'exécution du projet.

2.11 Les agriculteurs n'étaient pas tous disposés à participer au projet : en effet la SONADER était habilitée à :

- obliger les propriétaires de parcelles dans les zones de développement désignées à se grouper en coopératives de producteurs; ou à

- obliger les propriétaires de parcelles dans les zones de développement à louer leurs terres aux coopératives de producteurs créées par l'agence; et à

- superviser et contrôler pendant 25 années les coopératives de producteurs ainsi créées.

2.12 Le développement proprement dit devait être mené à bien directement par la SONADER, avec ses fonds et son personnel propres, et devait comprendre : la plantation des palmeraies, la plantation d'arbres, la constitution des troupeaux, la construction des routes nécessaires et de l'huilerie, le défrichage des emplacements des villages, la construction de ces derniers ainsi que la préparation et la plantation des zones de cultures vivrières annuelles.

2.13 Pendant les 25 années de vie du projet, la SONADER devait gérer les palmeraies, les zones de cultures annuelles ainsi que les éléments productifs du projet pour le compte des coopératives, mais non l'huilerie, qui lui appartiendrait. Pendant cette période, la SONADER devait assurer entièrement la gestion, l'administration et le contrôle financier des coopératives; toutes les recettes devaient lui être versées et ce n'est qu'après en avoir déduit tous les coûts, y compris l'amortissement des prêts, qu'elle versait l'excédent aux coopératives. Pendant la

période d'exécution du projet, la SONADER devait mettre en place les dix coopératives, ainsi qu'une organisation centrale - l'Union coopérative - qui devaient progressivement devenir gestionnaires du projet. La SONADER était habilitée à reprendre la direction des coopératives et même à les dissoudre si elles ne remplissaient pas leurs fonctions de façon satisfaisante. En pratique, les dix coopératives devant être débiteurs de la SONADER, cette dernière devait pouvoir exercer sur elles un degré élevé de contrôle direct pendant les 25 premières années de leur existence. Il était admis que c'est seulement ensuite, et après qu'elles se soient acquittées de leur dette envers la SONADER, que les coopératives deviendraient autonomes. La SONADER devait donc jouer deux rôles distincts dans la mise en oeuvre et le fonctionnement du projet : d'abord celui d'agence de développement et ensuite celui d'agent chargé de la gestion des coopératives.

2.14 Les coopératives. Chacune des dix coopératives prévues par le projet devait, en fin de compte, gérer 600 hectares de palmeraie, 600 hectares de cultures annuelles ainsi que la plantation d'arbres, l'élevage du bétail, la construction de bâtiments et l'achat d'équipement prévus parallèlement.

2.15 Les fermiers pouvaient devenir membres d'une coopérative en affermant leurs terres à cette dernière pour une durée de cinquante ans, ou en travaillant dans les palmeraies, ou de l'une et l'autre manière à la fois. Ils devaient recevoir, à titre de compensation, des parts de la coopératives qui leur assuraient un revenu fixe. En outre, les fermiers qui travaillaient dans les plantations avaient droit à une rémunération journalière en espèces ainsi qu'à une part des bénéfices réalisés par la coopérative.

2.16 Pour chaque hectare de terres qu'un fermier louait à la coopérative, il recevait une part "A" et un intérêt de 900 FCFA (3,60 dollars EU) par an. Les fermiers qui travaillaient pendant un minimum de 200 jours par an recevaient une part "B". Chacune de ces catégories de parts était évaluée à 30.000 FCFA (120 dollars EU). Les fermiers dotés de parts "B" recevaient 125 FCFA (0,50 dollar EU) par jour de travail dans la palmeraie. Etant donné que le salaire journalier "officiel" dans la zone du projet était de 275 FCFA (1,10 dollar EU), on considérait que les fermiers donnaient au projet un travail évalué à 150 FCFA (0,60 dollar EU) par jour, soit à un total de 30.000 FCFA (120 dollars EU). Les fermiers dotés de parts "B" recevaient aussi de la coopérative 1,5 hectare de terres défrichées qu'ils étaient tenus de cultiver de la manière prescrite par la SONADER. Tout excédent qui resterait après paiement de l'intérêt dû sur les parts "B", devait être utilisé pour améliorer l'équipement et pour accroître le salaire journalier des travailleurs employés dans les palmeraies.

2.17 La superficie de 1,5 hectare (1,4 ha net) cultivée en cultures annuelles devait être exploitée par les membres de la coopérative

et leurs familles comme des entreprises individuelles dont le produit appartenait à eux seuls. Toutefois, les coopératives devaient demander aux fermiers de cultiver 1,2 hectare de chaque parcelle selon une certaine rotation. Les fermiers pouvaient cultiver ce qu'ils voulaient sur la superficie restante (0,2 ha). Les coopératives fournissaient les semences, les engrais et autres facteurs de production aux fermiers, contre paiement, ainsi que les installations de commercialisation et d'entreposage que les fermiers n'étaient pas tenus d'utiliser.

2.18 Il convient de noter que les dispositions relatives aux parts "B" et aux parcelles occupées par les cultures annuelles se fondaient de toute évidence sur l'hypothèse i) qu'il y avait de la main-d'oeuvre en excédent dans la zone du projet, de sorte que les fermiers seraient disposés à travailler dans les palmeraies pour des salaires peu élevés, et ii) que les rotations requises pour les cultures annuelles étaient assez profitables pour présenter un intérêt pour les fermiers. En l'occurrence aucune de ces hypothèses n'était justifiée et c'est l'un des facteurs qui ont ultérieurement amené à modifier le projet de façon substantielle.

2.19 Les dix coopératives prévues par le projet devaient constituer une Union coopérative qui deviendrait en fin de compte propriétaire de l'huilerie, des silos à maïs et des autres facilités centrales. Comme c'était le cas pour les coopératives individuelles, l'Union des coopératives devait être gérée pendant 25 ans par la SONADER.

III. MISE EN OEUVRE

A. Récapitulation chronologique

3.01 Du fait des retards mentionnés plus haut, la mise en oeuvre du projet a commencé avant que le crédit entre en vigueur. Toutefois, si le programme de plantation de la palmeraie a pris un bon départ et a été achevée dans les délais prévus, il n'en a pas été de même des cultures annuelles, qui ont beaucoup moins bien réussi. Dès le début, les missions de supervision ont exprimé des doutes quant à leur avancement. En juin 1971, environ 1.500 ha de terres destinées aux cultures annuelles avaient été défrichées, contre 1.750 ha prévus au moment de l'évaluation, mais 700 ha seulement avaient été mis en culture, et il y avait peu de demandes de terres défrichées.

3.02 En outre, dès mi-avril, il ressortait de la planification détaillée de l'huilerie qu'il fallait prévoir une capacité de 20 tonnes/heure, qui serait ultérieurement portée à 40 tonnes/heure, alors que le projet prévoyait la construction, en deux étapes, d'une huilerie d'une capacité de 24 tonnes/heure. Il était indispensable d'accroître la capacité de l'huilerie, car il n'y avait plus de capacité disponible pour traiter les noix de palme que produirait le projet.

3.03 Enfin, le poids des responsabilités additionnelles que le gouvernement avait attribuées à la SONADER, et surtout sa participation au projet Mono et à l'extension rapide des palmeraies, venant s'ajouter au projet Hinvi, semblait être trop lourd pour elle et mettait en question son aptitude à mettre en oeuvre le projet. Le contrôle financier et administratif insuffisant qu'elle exerçait sur les coopératives, sa propre gestion financière et le mauvais entretien des palmeraies en témoignaient.

3.04 Une révision substantielle du projet, qui visait à redresser la situation, a été effectuée en 1971. Elle a amené essentiellement à renoncer à étendre encore les cultures annuelles (bien que le FAC ait insisté pour que le reste des terres défrichées soient mises en culture à ses frais); à affecter les fonds ainsi épargnés au financement supplémentaire qu'exigeait l'huilerie; et à réorganiser la SONADER de manière à lui permettre de surveiller de plus près le fonctionnement des coopératives et d'exercer, sur le terrain, un contrôle plus rigoureux des palmeraies.

3.05 Après cette importante révision, le projet a continué de progresser, mais non sans difficulté. L'huilerie a été construite, mais n'a pas pu être mise en service dans les délais prévus par suite de problèmes d'adduction d'eau. La passation de marchés pour les installations auxiliaires de l'huilerie s'est aussi heurtée à des difficultés par suite d'une collusion entre des entreprises qui avaient répondu à l'appel d'offres. Par contre, le programme des cultures annuelles a commencé à donner des résultats positifs grâce à l'utilisation d'attelages de bovins pour les travaux agricoles, et l'entreprise d'élevage a commencé à sentir les effets bénéfiques d'une meilleure gestion.

3.06 Les difficultés financières qu'a toujours rencontrées la SONADER sont à l'origine de tous les problèmes. Elles ont été aggravées par l'inaptitude de la SONADER à mettre au point et à appliquer un système adéquat de planification et de contrôle financiers, et par la fragilité de sa situation financière. Ces difficultés sont devenues cruciales en 1973 du fait de dévaluations successives du dollar EU par rapport au FCFA et, en janvier 1974, un crédit additionnel de 600.000 dollars EU lui a été accordé.

3.07 En définitive, le projet révisé a été achevé à la date prévue, au milieu de 1976. Un total de 6.000 hectares de palmeraies étaient alors en production; l'huilerie avait commencé à fonctionner en 1974; les cultures annuelles étaient pratiquées sur 1.500 hectares et des attelages de bovins étaient utilisés pour une partie de ces cultures. Il n'est pas encore possible de prévoir avec exactitude le rendement des palmiers à huile, mais ces derniers se sont remis des effets de la sécheresse. Un problème n'a pas été résolu : c'est celui que pose l'insuffisance des méthodes comptables de la SONADER et du contrôle financier que celle-ci exerce.

B. Révision du projet

3.08 Les révisions du projet effectuées en 1971 prévoyaient les mesures suivantes :

a) abandon de la construction de l'huilerie en deux phases (d'abord 16 tonnes de régimes de fruits frais/heure puis 24 tonnes de régimes de fruits frais/heure), et adoption de la construction d'une seule huilerie d'une capacité de 20 tonnes/heure, qui pourrait être portée à 40 tonnes/heure ultérieurement, si nécessaire;

b) accroissement du coût de l'huilerie, qui permet de prévoir un relèvement des prix ainsi qu'un surcroît d'installations auxiliaires;

c) réduction de la zone de cultures annuelles dont la superficie est ramenée de 6.000 à 1.700 hectares;

d) réduction de la capacité des silos à maïs qui est ramenée de 3.000 à 2.000 tonnes.

3.09 Ces modifications ont amené à réviser les estimations des coûts du projet comme l'indique le tableau ci-après :

FCFA	Evaluation	Chiffres révisés
	-------Millions de FCFA--------	
Huilerie	0,556	1,369 1/
Silos à maïs	0,040	-
Plantation de la palmeraie	0,945	1,076
Plantation des autres cultures	0,262	0,111
Infrastructure	0,158	0,202
Administration	0,179	0,212
Etudes	0,040	0,036
Imprévus	0,189	0,035
Total	2,370	3,021

1/ y compris la seconde chaîne, avec une production totale de 40 tonnes/heure.

3.10 Ces modifications ont été convenues par les Administrateurs le 13 septembre 1971 (IDA R71-63), et la description du projet a été modifiée en conséquence.

3.11 Il convient de noter que ce financement révisé a été fondé sur l'hypothèse que le FAC fournirait 1.235,6 millions de FCFA (4,5 millions de dollars EU), l'IDA 1.269,9 millions de FCFA (4,6 millions

de dollars EU) et que le reste, 515,8 millions de FCFA (2 millions de dollars EU) proviendrait du Gouvernement du Bénin (145 millions de FCFA) et de fonds engendrés par la SONADER (370,8 millions de FCFA). La contribution du gouvernement n'a jamais été versée, ce qui explique en partie les problèmes financiers que continue à rencontrer la SONADER. L'installation d'une deuxième chaîne de traitement a été différée, le volume de la production ayant été inférieur aux prévisions. Ultérieurement, les répercussions défavorables des réalignements monétaires (le taux de change dollar EU/FCFA est tombé de 1:277 à 1:225) ont amené l'IDA à porter, en février 1974, à 5,2 millions de dollars EU (soit un accroissement de 600.000 dollars) le montant du Crédit 144-IDA. A la fin de 1973, le FAC avait aussi augmenté sa subvention de l'équivalent de 510.000 dollars EU.

3.12 Les tableaux ci-après indiquent le plan de financement convenu finalement ainsi que la répartition proposée du crédit IDA révisé.

Projet final de répartition du crédit IDA
(Milliers de dollars EU)

Catégorie I	Etudes et construction de l'huilerie, installations et véhicules connexes	4.158
Catégorie II	a) Mise en place de la palmeraie	830
	b) Mise en place des autres cultures	159
Catégorie III	Imprévus	53
	Total	5.200

C. Coûts, décaissements et passation des marchés

3.13 Le tableau ci-après présente une comparaison entre les estimations des coûts du projet effectuées lors de l'évaluation, et les montants effectivement décaissés.

(Tableau page 12)

	Montants décaissés Millions de FCFA				Montants estimés Millions de FCFA (1 $EU = 247)
	IDA	FAC	Gouvernement	Total	Total
Etudes	-	40	-	40	40
Mise en place des palmeraies	230,9	458,5	-	689,5	945
Huilerie	962,4	-	-	962,4	556
Mise en place des cultures annuelles	-	201,0	4,2	205,2	197
Elevage (achat du bétail)	1,0	5,9	0,9	7,8	37
Plantation d'arbres	-	5,7	14,7	20,4	29
Personnel et formation professionnelle	25,9	53,7	-	78,6	40
Préparation des sites de villages, routes, véhicules, etc.	7,3	94,0	18,1	119,4	194
Silos à maïs	-	40,3	-	40,3	40
Frais généraux et entretien	9,0	66,9	14,9	90,8	124
Imprévus	-	-	-	-	168
Loyer	-	-	10,8	10,8	-
Total	1.236,5	966,0	63,6	2.266,2	2.370

3.14 Ces coûts sont fondés sur l'analyse des dossiers de remboursement tenus par la SONADER. Les coûts relatifs aux marchés ou les factures des fournisseurs sont exacts; le coût de la mise en place des palmeraies et des cultures annuelles comme des plantations d'arbres, les frais généraux et le coût de l'infrastructure sont fondés sur les crédits alloués par le SONADER au financement du coût du projet, et non sur les coûts effectifs qui ne sont pas connus (pas même par la SONADER) et sur lesquels il est impossible d'obtenir des précisions. Les missions de supervision de l'IDA ont recommandé à plusieurs reprises que la SONADER prenne des dispositions pour améliorer ses méthodes de comptabilité. En 1974 et 1975, le FED a payé les services d'un consultant, la SORGEM, qu'il a chargé de former le personnel et de mettre au point de nouvelles méthodes, mais cette initiative est restée pratiquement sans effets. Les bilans et les états financiers, s'ils sont plus exacts, ne sont pas vérifiés par des vérificateurs aux comptes et sont établis avec retard; le contrôle budgétaire et la gestion financière restent insuffisants. La SONADER s'est généralement conformée aux prescriptions de l'IDA pour la passation des marchés, en particulier pour l'huilerie. Toutefois, une mission de supervision de l'IDA a recommandé en 1974 de ne pas financer le coût exagéré d'un château d'eau (150.000 dollars EU), pour lequel le marché avait été passé sans que l'IDA ait été consultée. Cette recommandation n'a finalement pas été appliquée, car la SONADER aurait dû payer une erreur imputable au gouvernement, et celà aurait risqué de retarder l'exécution du projet.

3.15 Les déboursements et les passations de marchés ont été compliqués. Jusqu'à la révision de 1971, le FAC a payé la totalité de certains articles et le FAC et l'IDA ont partagé dans la proportion de 54 et 46 pour 100 respectivement le financement de la mise en place de la palmeraie; du personnel et de la formation professionnelle; de la préparation des sites des villages; des routes, etc.; du bétail; ainsi que des frais généraux et de l'entretien. Ensuite, l'IDA a financé en totalité le coût des installations auxiliaires, cependant que le coût de la plantation des palmiers, et du personnel et de la formation professionnelle continuait d'être partagé comme auparavant; et tout le reste était payé en totalité par le FAC. Avant 1969, tout était, évidemment à la charge du FAC.

IV. EVALUATION

4.01 Aux fins de la révision, on peut diviser le projet en trois parties : a) les composantes productives; b) les institutions; et c) les aspects coopératif et social.

A. Composantes productives

4.02 a) Plantation de palmiers à huile sur 6.000 hectares et entretien de ces palmiers jusqu'à leur maturité

	Plantations proposées et effectives			
Année civile	1968	1969	1970	Total
Superficie plantée : projetée	1.800	1.800	2.400	6.000
Superficie plantée : effective	1.835	1.842	2.403	6.075

Comme l'indique le tableau, les plantations ont été effectuées dans les délais prévus et avec des plantules de bonne qualité. Leur entretien a été généralement satisfaisant jusqu'à la fin de 1971, et le chiendent (imperata spp) qui s'était répandu sur une superficie de 1.070 hectares avait été nettoyé avant le début de la saison des pluies de 1972. Toutefois, la baisse du niveau de l'entretien observée cette année-là n'a pas encore été corrigée : la cause fondamentale de cette régression est de nature financière. Les membres des coopératives ne sont prêts à travailler pour le salaire de 125 FCFA par jour que paye la SONADER aux coopératives pour assurer l'entretien des jeunes palmiers que s'ils ne trouvent pas d'autre travail (c'est le cas, par exemple, pendant la saison sèche où il est facile de trouver de la main-d'oeuvre). C'est pourquoi pendant la saison des pluies l'entretien est très inférieur à ce qui serait jugé acceptable dans des plantations commerciales, ailleurs. Pour remédier à cet état de

choses, la SONADER a commencé à utiliser des machines agricoles dont l'achat a été financé spécialement par le FAC. Toutefois, il est peu vraisemblable que cette baisse de l'entretien entraîne une baisse sensible du rendement. En outre, ce dernier ne pouvant, en tout état de cause, pas être élevé dans la région du projet, il est peu probable qu'un net accroissement des frais d'entretien soit économiquement justifiable.

4.03 Malgré le déroulement satisfaisant de la plantation des palmiers et un entretien assez satisfaisant, il n'est pas encore certain que les rendements atteignent les niveaux prévus au moment de l'évaluation. En effet, les pluies tombées en 1971/72 et 1972/73 ont été trop peu abondantes à un stade critique de la croissance des palmiers. Il se peut également que le régime des pluies soit moins favorable dans cette région qu'on ne l'avait tout d'abord pensé.

4.04 Le tableau 4, en annexe, indique la répartition des pluies par campagnes pour les diverses plantations. La moyenne des précipitations par campagnes, pour les années 1969/70 à 1974/75, dans la région du projet a été d'environ 980 mm, contre environ 1.170 mm pendant la période 1941-1966 à Niaouli, aux confins de ladite région. Toutefois, deux des plantations ont bénéficié de précipitations qui s'écartaient de 5 pour 100 seulement de la moyenne enregistrée à Niaouli au cours d'une période de 25 années. Dans la région du projet elle-même, les pluies sont très différentes selon les plantations : celle de Dodji-Sehe où elles ont été les plus faibles en ayant reçu environ 1/3 de moins que celle d'Agbotagan qui a été la plus arrosée. Ces données, lorsqu'elles sont reportées sur une carte, ne mettent en évidence aucune configuration géographique.

4.05 L'incidence de longues périodes de sécheresse est un facteur très important qui limite la croissance des palmiers et le développement de leur culture. Toutefois, si l'on mesure la sécheresse par le nombre des périodes trimestrielles pendant lesquelles les précipitations sont inférieures à 100 mm, on s'aperçoit que les plantations les plus sèches ne semblent pas, à cet égard, être beaucoup plus mal placées que celles où les précipitations sont importantes.

4.06 Compte tenu des données dont on dispose, il semble évident que les écarts substantiels entre les plantations ont été un facteur adverse que la mission d'évaluation ne connaissait pas. En outre les pluies anormalement faibles enregistrées pendant deux années ont fortement affecté la moyenne des six années considérées. Cependant, toutes les moyennes annuelles ont été inférieures à la moyenne de Niaouli et deux seulement d'entre elles s'en écartaient de 10 %. Il semble donc possible que la moyenne à long terme des pluies dans la région du projet, et par conséquent les rendements, soient quelque peu inférieurs à ceux que prévoyait le rapport d'évaluation.

4.07 Le tableau ci-après indique les estimations initiales et révisées des rendements prévus :

Rendements comparés, estimés et révisés
tonnes de régimes de fruits frais par hectare

Nombre d'années après la plantation	5	6	7	8	9	10	11	et les douze années suivantes
Estimations lors de l'évaluation (1969)	3,0	5,0	6,5	7,5	8,0	8,0	8,0	
Estimations révisées par l'IRHO (1973)	0,5	1,5	3,0	4,0	6,0	8,0	8,0	
Estimations révisées par la Banque (1973)	0,3	1,7	2,3	3,6	5,6	6,3	7,0	
Dernières estimations (1976)	0,5	1,5	3,0	4,0	6,0	7,0	7,0	

4.08 La cueillette des régimes de fruits frais a commencé pendant les trois premiers mois de 1973, où les palmiers des coopératives d'Agbotagon et de Goulo, plantés au début de 1968, ont produit 116 tonnes de régimes. Après celà, les rendements et la production ont progressé comme suit :

	Campagne 1973/74		Campagne 1974/75	
	Rendement tonnes/ha	Production tonnes	Rendement tonnes/ha	Production tonnes
	(6ème année après la plantation)		(7ème année après la plantation)	
Agbotagon	2,939	1.184,890	2,626	1.605,050
Attogon	0,704	429,972	2,490	1.519,360
Goulo	2,318	1.423,473	1,875	1.151,396
	(5ème année après la plantation)		(6ème année après la plantation)	
Koundokapoe	0,221	137,954	1,864	1.153,874
Sedje			1,099	661,063
Rodji			0,629	391,600
			(5ème année après la plantation)	
				68,330
		3.176,289		6.550,676

4.09 Les chiffres ci-dessus montrent que, pendant la 6ème année qui suit la plantation, le rendement moyen de l'ensemble de la région du projet était d'environ 1,4 tonne/ha ce qui est très inférieur aux estimations faites lors de l'évaluation, mais à peu près égal aux estimations révisées établies par la Banque et l'IRHO en 1973. En outre, le rendement moyen devrait être ajusté pour tenir compte du fait qu'à Attogon, 300 hectares seulement avaient produit des régimes, le reste ayant été dévasté par l'incendie.

4.10 Toute estimation de l'évolution probable de la production doit tenir compte de deux autres facteurs, les effets de l'incendie et du vol. Pendant le premier trimestre de 1973 les palmiers ont été brûlés sur 495 hectares par suite d'incendies provoqués par les fermiers lorsqu'ils brûlaient leurs champs. Toutefois la sécheresse était anormale cette année-là et il n'y a pas eu d'autres incendies depuis lors.

4.11 Cependant, le vol que facilite la mauvaise organisation de la cueillette des régimes est un problème important qui risque de remettre en question la viabilité du projet. Par exemple, le rapport de la SONADER pour le 2ème trimestre de 1975 mentionne au par. 3 "l'éternel problème du vol des régimes". Ce vol est essentiellement dû au prix très bas payé aux coopératives (environ 3,8 FCFA le kilo de régime) lequel se répercute sur le salaire en espèces des cultivateurs qui travaillent dans les plantations et sur la marge brute d'autofinancement des coopératives.

B) Mise en place des cultures annuelles

4.12 La composante "cultures annuelles" du projet a pour objet i) d'introduire un système de rotation des cultures qui remplace le mode de cultures généralement pratiqué dans la région du projet; et ii) d'encourager l'emploi de semences de variétés améliorées, d'engrais et d'autres facteurs de production. On espérait que ces mesures accroîtraient sensiblement la productivité et permettraient à une famille participante moyenne de s'assurer avec les seules cultures annuelles un revenu annuel en espèces d'environ 42.150 FCFA (172 $EU) en 1980, contre environ 12.000 FCFA (49 $EU) en l'absence du projet (en FCFA constants de 1967).

4.13 Les propositions relatives aux cultures annuelles étaient les suivantes : i) une parcelle type de 1,5 ha (1,4 ha net) devait être cultivée selon une rotation qui, avec le régime de deux saisons - dont une saison sèche et une saison de pluies - de la région du projet, permettrait de cultiver chaque année 0,4 ha d'arachides, 0,4 ha de coton, 1,2 ha de maïs et 0,2 ha d'autres cultures; et ii) l'utilisation de variétés améliorées d'engrais et d'autres facteurs de production permettrait d'obtenir des rendements moyens à l'hectare qui, en 1980, atteindraient 1.260 kilos d'arachides (non décortiquées); 1.000 kilos de coton-graine; et 2.300 kilos de maïs (en grains). Ces propositions prévoyaient

que l'agriculture continuerait de ne pas être mécanisée.

4.14 Les superficies consacrées aux cultures annuelles devaient augmenter rapidement, comme l'indique le tableau ci-après :

1968	1969	1970	1971	1972	1973	1974	1975	1976
				(hectares)				
317	600	1.150	1.750	2.400	3.300	4.200	5.200	6.000

Les lots devaient être défrichés par la SONADER qui devait également délimiter les parcelles individuelles et construire les routes d'accès. La superficie normale était de 1,5 ha, mais les familles qui disposaient d'une main-d'oeuvre assez nombreuse devaient être autorisées à exploiter deux parcelles; mais 3 ha devait être la superficie maximale qui pouvait être attribuée à un membre de la coopérative.

4.15 Le programme de mise en place des cultures annuelles s'est vite heurté à des difficultés, le nombre des fermiers disposés à cultiver des parcelles était inférieur aux prévisions, l'utilisation des facteurs de production était très réduite, et les rendements n'atteignaient pas les objectifs qu'avait fixésle rapport d'évaluation. En 1971, une mission de supervision de la Banque attribuait cet échec a) au fait que les agriculteurs n'étaient pas disposés à abandonner les méthodes de culture traditionnelles et à adopter un système de rotation complexe qui exigeait d'eux beaucoup de discipline; b) aux résultats médiocres de la culture du coton, imputables aux ravages causés par les insectes; c) aux faibles rendements et aux prix peu élevés des arachides; et c) à l'absence à la fois de crédit agricole et de débouchés à des prix assurés. Pour toutes ces raisons, les fermiers préféraient défricher de petites parcelles de brousse et y cultiver les aliments dont ils avaient besoin selon les méthodes traditionnelles, plutôt que d'accepter des parcelles de terres des coopératives et les obligations qu'elles impliquaient. La mission a conclu qu'en 1976 (date de clôture du crédit IDA) 3.000 ha auraient pu être mis en valeur si l'on avait trouvé des solutions à ces problèmes et modifié quelque peu la rotation. Toutefois, on a ensuite convenu de limiter les travaux à la préparation de 1.700 ha pour les cultures annuelles.

4.16 Depuis 1971 un événement imprévu a incité à reconsidérer l'élément "cultures annuelles" du projet : il s'agit de l'introduction, avec l'assistance technique financée par le FAC, d'attelages de bovins et de charrues, de herses, de motoculteurs et de charrettes. Les premiers essais de culture attelée ont été faits en 1969, et le nombre d'attelages (deux boeufs et l'équipement) a augmenté très rapidement, de même que le nombre des fermiers utilisant la traction animale (les fermiers qui possèdent attelage et équipement les louent à d'autres planteurs). C'est ainsi que pendant la campagne 1975, quelque 150 paires de boeufs ont

cultivé un total de 751 ha (dont 442 pendant la saison principale et 309 pendant la saison courte), et environ 3.000 transports ont été effectués à l'aide de charrettes tirées par des attelages de bovidés.

4.17 Dans les dix coopératives, 880 fermiers ont pratiqué la culture attelée avec les attelages de bovins fournis par 155 unités. Les avantages que présente l'emploi de bovidés pour la culture sont tels, aux yeux des fermiers, que la majeure partie des 6.262 ha réservés pour les cultures annuelles ont été pris en charge par des fermiers qui pratiquent la culture à traction humaine jusqu'à ce qu'ils puissent obtenir des bovidés et l'équipement nécessaire. L'octroi d'un crédit pour l'achat de boeufs et de l'équipement nécessaire est subordonné à l'arrachage des souches et des racines du terrain appartenant au fermier demandeur, ce qui représente un travail considérable dans les zones dites "de culture attelée" (ZOCA) où 1.700 ha seulement ont été défrichés par la SONADER, c'est à dire que les arbres et les arbustes y ont seulement été coupés au ras du sol. Malgré la difficulté du travail requis et le fait que le fermier doit en outre effectuer le versement comptant de 30.000 FCFA (120 $EU) pour son attelage et l'équipement nécessaire, dès mars 1976, 746 lots avaient été débarrassés des souches et des racines.

4.18 La culture attelée présente l'avantage d'accroître les rendements grâce au fait qu'elle permet d'effectuer en temps utile les travaux de plantation et d'ensemencement à des moments où il y a peu de main-d'oeuvre disponible. Les rendements estimés par la SONADER pour les années 1973-75, fondés sur une enquête par sondage, sont les suivants :

(Tableau page A.19)

Comparaison entre les rendements des fermes à culture manuelle et ceux des fermes à culture attelée

Culture pratiquée	Année	Saison principale		Saison courte		Principale saison des pluies		Petite saison des pluies		Nombre de fermiers pratiquant la		Total
		Culture manuelle	Culture attelée	Culture manuelle	Culture attelée	Culture manuelle	Culture attelée	Culture manuelle	Culture attelée	Culture manuelle	Culture attelée	
		(Superficie cultivée - ha)				(kg/ha)						
Maïs (en grains)	1973	793	111	600	64	1.510	2.585	582	2.505	1.440	352	1.792
	1974	954	289	624	149	1.000	2.800	900	2.100	2.426	799	3.225
	1975	996	380	1.188	304	1.100	2.300	1.000	1.900	2.099	880	2.979
Arachides (non décortiquées)	1973	16	16	7	21	1.580	2.505	1.521	2.550			
	1974	31	28	28	45	1.000	3.000	1.300	1.900			
	1975	55	38	13	80	1.800	2.000	800	1.800			
Niébé (en grains)	1973	45	5	-	2	N/D	598	571	588			
	1974	20	12	5	8	800	1.100	N/D	800			
	1975	20	21	7	12	700	1.000	300	400			
Cotongraine (coton)	1973	-	-	-	46	-	-	-	599			
	1974	-	-	-	-	-	-	-	500			
	1975	-	-	-	53	-	-	-	400			

4.19 Le tableau montre clairement le nombre croissant des fermiers, et les régions où est pratiquée la culture attelée, ainsi que l'accroissement substantiel du rendement des cultures du maïs et des arachides auquel aboutit cette dernière. Cet accroissement serait important, même si les chiffres communiqués par SONADER sont inexacts, et explique le grand nombre des fermiers qui demandent à acquérir les attelages et l'équipement nécessaires. Le tableau fait également ressortir les résultats généralement médiocres obtenus pour le coton, ainsi que les possibilités d'amélioration du rendement du niébé, encore que le nombre des cas étudiés ne soit peut-être pas suffisant pour que l'on puisse en tirer des conclusions très valables.

4.20 Il semble toutefois raisonnable de supposer que les objectifs de rendements qu'avait fixés le rapport d'évaluation pour le maïs et les arachides seront dans l'ensemble atteints d'ici à 1980, non seulement sur la superficie révisée de 1.700 hectares, mais aussi sur les 6.000 hectares projetés initialement, si toutefois rien ne freine la généralisation de la culture attelée. Les rapports les plus récents indiquent un certain ralentissement de l'approvisionnement en bovidés de trait, auquel la SONADER et les pouvoirs publics devraient s'efforcer de remédier à l'avenir.

4.21 En résumé, le programme de cultures annuelles a maintenant atteint le stade où il devrait pouvoir être développé avec succès; toutefois, les résultats satisfaisants mentionnés plus haut risquent d'être compromis : en effet, la SONADER n'a pas réussi à organiser l'expansion de la traction animale depuis 1974, en raison de la difficulté de se procurer des boeufs de trait aux prix trop faibles fixés par le gouvernement, ce qui risque de décourager rapidement les fermiers.

4.22 Bétail. Le projet prévoit l'achat de 310 têtes de bétail pour le développement de la production de viande. Cet achat a été effectué et les animaux ont été répartis entre les 10 coopératives, y compris les quatre qui ont été financées par le FAC. En 1975, le troupeau comptait 1.030 têtes de bétail. Les services vétérinaires sont adéquats et le troupeau s'est multiplié de façon satisfaisante. Toutefois, les coopératives ne tirent pas de bénéfices de cet élément du projet, car les animaux disponibles à la vente sont vendus à un prix, fixé par le gouvernement, qui est d'environ 50 % inférieur à celui du marché. Le troupeau est composé essentiellement de Ndama qui, en raison de leur petite taille peuvent difficilement être transformés en animaux de trait.

4.23 Boisement. Un total de 1.000 hectares ont été plantés de cassiers et de teck en 1972 et 1973, comme le prévoyaient les objectifs fixés dans le rapport d'évaluation. Les plantations dépendant de chacune des coopératives n'ont pas toutes été entretenues de façon adéquate et certaines d'entre elles ont été décimées par des feux de brousse au premier stade de leur croissance. Néanmoins, leur développement a été dans l'ensemble, satisfaisant. On ne possède pas d'informations sur le nombre d'arbres qui ont été mis à la disposition des coopératives.

4.24 Huilerie. Le contrat pour la construction de l'huilerie a été passé en 1971 avec Wecker (Luxembourg), le soumissionnaire dont l'offre était la plus basse qui ait été reçue à la suite d'un appel d'offre international. Les autres soumissionnaires étaient SPEICHIM et VOYER (France). La construction de l'huilerie a commencé en 1972 et a été achevée en 1974, comme prévu. Toutefois, elle n'a commencé à fonctionner qu'à la fin du 1er semestre de 1975, par suite du retard imputable à l'installation d'un puits instantané, à l'insuffisance de l'approvisionnement en eau (environ 10 m3/heure au lieu des 20 m3/heure envisagés) et à la passation d'un marché pour l'achat du matériel de pompage. Le coût total de l'investissement est de 962,4 millions de FCFA (3,9 millions de dollars EU), comme prévu en 1971, lors de l'évaluation du projet (détails à l'Annexe 2).

4.25 L'huilerie fonctionne de façon satisfaisante, mais elle s'est heurtée à des difficultés dues à plusieurs facteurs : tout d'abord, la production de pointe est plus importante et plus concentrée que ne le prévoyait l'évaluation; en conséquence, l'huilerie était très embouteillée pendant la saison de pointe de 1976 et 1977; en second lieu, l'huilerie ne peut pas traiter la proportion élevée de palmiste (environ 6-7 % des régimes de fruits frais, au lieu de 4-5 %) prévue (et due sans doute à l'utilisation de variétés hybrides) pour laquelle elle n'était pas conçue; enfin, la capacité d'entreposage de l'huile est insuffisante et doit être augmentée. En outre, WECKER devait procéder au début de 1977 à une amélioration des machines, dans le cadre de la clause de garantie.

4.26 La qualité du sol n'est pas, non plus, adéquate en raison de la mauvaise organisation du ramassage des fruits sur le terrain (voir par. 4.12). En conséquence, la teneur en acide gras libre est habituellement supérieure à 7 %, alors que l'huilerie est conçue pour produire une huile dont la teneur en acide gras libre est inférieure à 4 %. La situation est aggravée par les mauvaises conditions d'entreposage tant à l'huilerie qu'au port d'embarquement; toutefois ceci ne devrait pas avoir de répercussions sur les prix, étant donné que l'huile est presque entièrement commercialisée dans le pays ou au Nigeria. On ne possède pas d'informations sur les quantités ni les prix de l'huile vendue dans le pays, au Nigeria et sur les autres marchés d'exportation. Il en est de même pour les coûts de traitement, d'entretien, de transport et d'entreposage.

4.27 L'entretien de l'huilerie est presque adéquat et pourrait être quelque peu amélioré, et l'huilerie en opération est supervisée deux fois par an par un ingénieur expatrié que le FED fournit à la SONADER dans le cadre d'un arrangement relatif à l'huilerie AGONVY. L'IDA a approuvé la nomination du directeur de l'huilerie, comme le prévoyait l'accord de crédit. Pendant les négociations qui ont eu lieu en 1971, la SONADER a convenu de mettre en place une Unité technique, responsable de l'entretien des trois huileries dont elle devait assurer la gestion. Cette unité existe, mais elle manque encore de techniciens et d'ateliers. Il est impératif qu'elle puisse fonctionner, maintenant que la SONADER a également repris la direction des trois huileries que gérait auparavant la SNAHDA.

4.28 La SONADER prévoit maintenant de porter la capacité de l'huilerie HINVI de 20 t/heure à 40 t/heure pour faire face à la production prévue en 1979-80. Entre temps, l'ingénieur du FED a pu accroître la production des presses, qu'il a portée à 30 t/heure, et a préparé des plans qui doivent permettre de porter immédiatement le potentiel d'écrasement des amandes de 1 tonne à 1,5 t/heure. Au total, l'investissement additionnel nécessaire à HINVI est estimé à 900 millions de FCFA (4 millions de dollars EU) aux prix de 1976, et pourrait à lui seul justifier le financement d'un second projet, à condition qu'une amélioration de l'organisation du ramassage garantisse un approvisionnement adéquat (par. 4.12).

C. Institutions

4.29 Les principales institutions du Bénin qui sont concernées étaient la SONADER et la SNAHDA*. Il semble que l'appui accordé à la SONADER par la Banque ait été justifié et fructueux. La SONADER était essentiellement chargée de stimuler la production, et la SNAHDA du traitement et de la vente de l'huile de palme et de palmiste. Toutefois, en raison des doutes exprimés quant à l'aptitude de la SNAHDA à construire et à gérer l'huilerie nécessaire pour traiter la production projetée, il a été convenu de confier cette tâche à la SONADER. On peut estimer qu'il aurait été préférable, du point de vue institutionnel de conserver la SNAHDA et d'essayer d'en améliorer le fonctionnement. Toutefois, étant donné que l'huilerie projetée n'était qu'une parmi plusieurs autres que gérait la SNAHDA, il est peu probable que la Banque ait pu exercer une pression suffisante pour accroître sensiblement l'efficacité de la SNAHDA. Il est vraisemblable que l'on a bien fait de confier à la SONADER le soin de construire et de gérer la nouvelle huilerie.

4.30 La crise qui couvait au sein de la SONADER a éclaté en 1973. Cette dernière essayait alors d'assumer la lourde responsabilité à la fois du développement rural, et d'un programme accéléré de développement des palmiers à huile, à laquelle s'ajoutaient des problèmes de marge brute d'autofinancement et de financement. L'ensemble de ces facteurs a entraîné une baisse de la qualité de la gestion des plantations de palmiers à huile (aggravée par des conditions atmosphériques adverses), un relâchement du contrôle et de la direction des coopératives, et une détérioration de la politique et du contrôle financiers de la SONADER.

4.31 Il ne fait guère de doute que l'intervention de la Banque et du FAC, à ce moment-là, a contribué au redressement de la situation et permis à la SONADER de se tirer d'affaire. Cette intervention a consisté essentiellement en l'apport au projet de capitaux additionnels (dont 600.000 dollars

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* Note : leur nom a changé à plusieurs reprises : la SONADER s'appelle maintenant la SOBEPALH et la SNAHDA, la CONICOG. Toutefois leurs fonctions n'ont pas changé sensiblement et nous avons conservé leur ancien nom pour plus de commodité.

EU provenant de la Banque et 520.000 dollars EU du FAC) et une réorganisation administrative destinée à renforcer le contrôle des plantations sur le terrain et à mieux orienter les activités des coopératives. Il semble que, dans l'ensemble, ces objectifs aient été atteints, bien que, ainsi que nous l'avons déjà mentionné, le problème que posent la politique et le contrôle financiers de la SONADER ne semble pas encore entièrement résolu.

4.32 Deux autres facteurs prouvent que la SONADER est une institution fondamentalement bien gérée et viable. L'un est la longueur et l'exactitude des rapports qu'elle établit, lesquels n'ont pas cessé de s'améliorer depuis le début de la mise en oeuvre du projet, et fournissent une quantité de renseignements sur tous les aspects de ses activités. L'autre est l'introduction de la culture attelée. Le fait que, lorsque le programme de cultures annuelles, tel qu'il était conçu initialement, s'est avéré un échec, la SONADER ait essayé une nouvelle approche avec l'aide du FAC, prouve clairement qu'elle est capable de s'adapter et de tirer des renseignements de l'expérience.

D. Le projet vu sous l'angle coopératif et social

4.33 On continue de s'interroger sur cet aspect du projet. Il va de soi que pendant les premières années du projet, les fermiers qui appartenaient à une coopérative ne se considéraient pas comme les propriétaires des plantations de palmiers responsables de leur réussite ou de leur échec. Au contraire, les fermiers considéraient que le travail était mal rémunéré dans les palmeraies et ne venaient y chercher un emploi que lorsqu'il n'y en avait pas ailleurs. Il semble qu'il en soit encore de même, si bien qu'il y a entre le travail des plantations et le travail dans les champs qui appartiennent aux fermiers, une concurrence qui est particulièrement sensible pendant la saison des pluies.

4.34 Ainsi, bien qu'un encadrement coopératif ait été mis en place, il est difficile d'en conclure qu'il a vraiment pris racine. Peut-être les choses s'arrangeront-elles à mesure que se répandra la culture attelée, les coopératives ayant un rôle important à jouer dans sa propagation, de même que dans la répartition des facteurs de production nécessaires pour améliorer les méthodes de culture. Il n'est, toutefois, pas douteux que, sur le plan social, le projet a eu d'importantes répercussions sur les fermiers qui y participent. Dans une région agricole où les conditions naturelles (climat, sol) sont marginales et où la productivité potentielle est faible, une nouvelle technologie a néanmoins été introduite, et l'on peut y voir les fermiers adopter de meilleures méthodes de culture que ne font ceux d'autres régions du pays, ce qui est loin d'être un résultat négligeable.

4.35 Par surcroît, la construction des routes et des villages prévus par le projet permettra aux fermiers non seulement d'accroître leur revenu mais aussi d'améliorer leur standard de vie.

4.36 Financement des coopératives. Les marges brutes d'autofinancement prévues pour les coopératives ne sont pas suffisantes, même si l'on atteint le rendement de 7 tonnes de régimes de fruits frais projeté. Tout d'abord les coopératives sont très lourdement endettées; ensuite, la SONADER (de même que les pouvoirs publics) ne tient pas à augmenter le prix qu'elle paie aux coopératives les régimes de fruits frais. Le prix actuel de 5 FCFA le kilo de régimes de fruits frais est très en-dessous de celui en vigueur en Côte d'Ivoire (9 FCFA) où les intérêts sont subventionnés. Toutefois, dans les circonstances présentes, il est peu probable que les pouvoirs publics acceptent de modifier leur politique, en raison de la concurrence entre les palmiers sélectionnés - dont le transport et le traitement sont plus coûteux - et les autres. Dans ces conditions, les coopératives ne seraient jamais en mesure de rembourser leurs dettes comme le prévoit l'accord de crédit. A l'heure actuelle, le taux de rentabilité de l'investissement est égal à -0,45 % pendant 25 ans, mais il pourrait être porté à 4,7 % si le prix payé pour les régimes était de 7 FCFA le kilo (+40 %), prix que la SONADER peut raisonnablement payer, compte tenu de l'évolution actuelle et future de la tendance en ce qui concerne les produits du palmiste. Le gouvernement a été invité à plusieurs reprises - et c'était là une condition mise à la renégociation du crédit en 1971 - de présenter, pour résoudre ce problème, une solution que l'IDA juge satisfaisante. Aucune proposition n'a encore été soumise.

V. RESULTATS ECONOMIQUES

5.01 Le taux de rentabilité économique du projet a été recalculé de la façon suivante:

Flux coûts :

a) le coût de la main-d'oeuvre jusqu'à la fin de 1976, pour les palmeraies et pour les huileries est inclus tel quel - que le travail soit ou non fourni par des membres des coopératives - après cette date, il est estimé à un minimum de 125 FCFA/jour (0,5 $EU) jusqu'à 1975 et à 200 FCFA (0,8 $EU) après cette date, de manière à refléter plus exactement le coût d'opportunité de ce travail;

b) aucun coût additionnel n'est attribué à l'élément "production des cultures annuelles" du projet après 1975 en dehors du coût renouvelable des semences et des autres facteurs de production employés, et du remplacement des animaux de trait et de l'équipement; la raison en est que les niveaux actuels de production peuvent être maintenus pendant au moins 10 ans sans qu'il soit nécessaire de faire de nouveaux investissements dans l'infrastructure ou la vulgarisation agricole et les services auxiliaires.

Flux avantages :

c) on ne fait aucune déduction pour la production d'huile de palme et de palmistes qu'auraient donné les palmiers sauvages qui se trouvaient sur les terres qu'occupe actuellement le projet, car le bénéfice net qui en serait résulté aurait été

peu important et difficile à quantifier, et était compensé dans le calcul, par l'attribution à la main-d'oeuvre sur le terrain de la valeur uniforme tout au long de l'année de 125 FCFA/jour (0,5 $EU) jusqu'à la fin de 1975, et de 200 FCFA (0,8 $EU) après cette date; et

d) dans l'hypothèse où la production des cultures annuelles se stabilise aux niveaux de 1975 sur les 1.500 hectares où la récolte est effectuée actuellement sous le contrôle de la SONADER, et où l'on considère la différence entre la production effective et la production estimée que produirait la culture traditionnelle comme un bénéfice, on suppose que les fermiers qui pratiquent la culture traditionnelle obtiennent, en participant au projet, un rendement supplémentaire de 25 %, et ceux qui pratiquent la culture attelée un rendement nettement supérieur.

En outre, les coûts des composantes "boisement" et "élevage" du projet et les bénéfices qu'elles procurent n'entrent dans les flux ni des coûts, ni des avantages, et ce, pour les raisons suivantes : a) l'expérience prouve que le programme d'élevage doit être considéré comme un essai et que les avantages, probablement substantiels, du boisement ne peuvent pas encore être quantifiés; et b) l'incidence de ces composantes sur le taux global de rentabilité est négligeable.

5.02 Le rapport d'évaluation a estimé le taux de rentabilité économique à environ 12 % pendant une vie de 25 années. Dans ce calcul, le coût du travail fourni par les membres des coopératives tant dans la phase d'investissement que dans la phase opérationnelle, était évalué à zéro. En outre, un montant était soustrait au flux avantages pour tenir compte de la valeur estimée de la production vendue contre des espèces, qu'aurait produite la terre occupée par le projet si ce dernier n'avait pas été mis en oeuvre. Les mérites de cette technique sont discutables, et cela d'autant plus que le succès de la culture attelée prouve qu'il a une pénurie de main-d'oeuvre pendant une partie de l'année, et qu'en fait, il a fallu recourir à l'emploi massif de main-d'oeuvre recrutée, en dehors de la région du projet, pour travailler dans les palmeraies. Par conséquent, compte tenu des principaux changements intervenus depuis l'évaluation - y compris le retard avec lequel les palmiers ont commencé à produire, le faible rendement prévu des palmistes, la forte augmentation de la valeur des productions et l'échec des programmes initiaux de cultures annuelles - il ne semble pas approprié de calculer, aux fins de comparaison, un taux de rentabilité révisé sur la même base, étant donné les circonstances actuelles.

5.03 Pour le calcul du taux de rentabilité économique, les coûts d'investissement ont été répartis comme suit :

	Jusqu'à 1969	1970	1971	1972	1973	1974	1975	Total
Coût effectif :	448,9	181,2	196,6	403,4	707,5	175,8	112,8	2.226,2
aux prix constants de 1976	982,3	370,5	378,8	714,0	1056,0	214,4	117,6	

5.04 Quant aux avantages que procure l'huile de palme, il convient pour leur répartition chronologique de se fonder sur l'hypothèse que chaque palmeraie commencera à produire cinq ans après la plantation et que les rendements enregistreront la progression ci-après :

	Année 5	6	7	8	9	10	11
tonne de régimes de fruits frais par hectare	0,5	1,5	3,0	4,0	6,0	7,0	7,0

5.05 On suppose que lorsque les plantations seront arrivés à pleine production le rendement sera pour l'huile de palme de 21 % et pour les palmistes de 5 %.

5.06 On suppose que les prix CAF de l'huile de palme et des palmistes seront de 578 $EU et 240 $EU respectivement, en 1980, ce qui équivaut à 13.400 FCFA la tonne de régimes de fruits frais aux prix de 1976. Ces prix sont conformes aux prévisions des cours des produits de base.

5.07 Il n'existe pas au Bénin de données sur lesquelles on puisse se fonder pour calculer les avantages économiques de la composante cultures annuelles; ce calcul a donc été effectué sur la base des prix/départ ferme estimés récemment dans les pays limitrophes.

5.08 Le taux de rentabilité ne varie qu'en fonction des rendements en huile de palme, car les avantages tirés des cultures annuelles sont faibles. Etant donné le caractère très conjecturel des estimations de la production d'huile de palme, le calcul du taux de rentabilité a, lui aussi, été fondé sur des rendements plus faibles, et serait de 2,5 % avec un rendement moyen de 6 t/ha, de zéro % avec un rendement de 5 t/ha. L'écart avec les estimations du rapport d'évaluation provient essentiellement des avantages importants que l'on pense tirer de l'expansion des cultures annuelles, avantages qui ne sont pas encore entièrement matérialisés bien que certains signes attestent que ces cultures peuvent encore être développées.

VI. CONCLUSION

6.01 Evaluation de l'intervention de l'IDA. Le projet a été étroitement supervisé depuis le début. L'IDA a démontré son aptitude à faire face aux problèmes rencontrés :

a) en 1971, le projet a été modifié de manière à assurer un financement adéquat de l'huilerie d'Hinvi;

b) en 1973, des crédits supplémentaires ont été fournis pour compenser les pertes qu'avaient entraînées les variations des taux de change.

Les missions de supervision se sont en général préoccupées davantage de la situation financière de la SONADER que de celle des coopératives: elles estimaient que la SONADER était vitale pour la bonne exécution du projet, et qu'il n'était pas possible de résoudre les difficultés aux auxquelles se heurtaient les coopératives en raison des rendements extrêmement faibles estimés en 1973-75, où les effets de la sécheresse se faisaient le plus sentir. Toutefois, nous sommes maintenant en mesure de prédire que le volume de la production sera voisin de celui qu'indiquait le rapport d'évaluation; les problèmes financiers des coopératives pourront donc être résolus par un relèvement du prix payé pour le régime de fruits frais.

6.02 Avenir du projet. Le projet se trouve maintenant devant deux problèmes majeurs concernant l'un l'organisation et l'autre la situation financière des coopératives. Le projet, tel qu'il était conçu à l'origine, devait réaliser l'intégration de la culture des palmiers à huile et des cultures annuelles, dans un cadre coopératif qui devait devenir autonome, avec le soutien d'une seule institution, la SONADER. Le gouvernement a maintenant décidé que "CARDER de l'atlantique" serait chargé de la vulgarisation agricole et que la SONADER (qui s'appelle désormais SOBEPALH) organiserait la récolte des palmistes; deux organismes interviendront donc dans la gestion du projet, ce qui équivaut à l'abandon de l'idée d'intégration. Ces nouvelles dispositions aggraveraient sans aucun doute les difficultés auxquelles se heurte déjà la SONADER pour organiser la récolte des palmistes (voir par. 4.02). En outre, le gouvernement envisage d'enlever aux coopératives les plantations de palmiers, qui seraient entretenues et dont les fruits seraient récoltés par la SOBEPALH avec l'aide d'une main-d'oeuvre qu'elle recruterait. Le deuxième problème réside dans le fait que les coopératives ne reçoivent pas une fraction adéquate de la valeur des palmeraies. Avec un prix de 5 FCFA le kilo de régimes de fruits frais (37 % des recettes nettes), elles ne peuvent ni payer plus de 200 FCFA (0,8 $EU) par homme-jour à leurs membres, ni rembourser leurs dettes. C'est ainsi que se trouve compromis l'important concept de coopératives autonomes. Le gouvernement n'ignore pas ces problèmes et continue, à titre temporaire, de charger la SOBEPALH de superviser les

coopératives dans la région du projet. Il n'est pas impossible que d'autres entretiens aient lieu avec les pouvoirs publics sur ce sujet important, car SOBEPALH est à la recherche de capitaux extérieurs dont elle a besoin pour accroître la production de l'huilerie d'Hinvi. L'IDA a accepté, en principe, d'examiner un nouveau projet Hinvi qui financerait l'agrandissement de l'huilerie ainsi que la propagation de la culture attelée. Ces questions feraient à nouveau l'objet de discussions avec les pouvoirs publics au cours des prochaines négociations du projet d'assistance technique, prévues en mars/avril 1977.

ANNEXE I
Tableau 1

BENIN

Projet d'Hinvi

Marge brute d'autofinancement d'une coopérative (600 ha)

aux prix de 1976

(Milliers de FCFA)

	AP 1 3/	AP 2	AP 3	AP 4	AP 5	AP 6	AP 7	AP 8	AP 9	AP 10	AP 11	AP 12
ENTREES												
Prêt au développement	102400	12700	9000	9000								
Avances à court terme			3150	990	990							
Vendes de régimes de fruits frais 1/					1500	4500	9000	12000	18000	21000	21000	21000
Total des entrées	102400	12700	12150	9990	2490	4500	9000	12000	18000	21000	21000	21000
SORTIES												
Mise en place des palmeraies	79800	9000	9000	990								
Défrichage complémentaire		3150	3150	990	990							
Entretien (outils, engrais)				3420	3420	3420	3420	3420	3420	3420	3420	3420
Entretien (main d'oeuvre) 2/				3360	2880	2400	2400	2400	2400	2400	2400	2400
Récolte (main d'oeuvre) 2/				180	540	1080	1440	2160	2520	2520	2520	2420
Frais généraux des coopératives				3060	3060	3060	3060	3060	3060	3060	3060	3060
Loyer				540	540	540	540	980	980	980	980	980
Cultures annuelles	19700											
Elevage		3700										
Boisement	2900											
Total des sorties (service de la dette non déduit)	102400	12700	12150	9990	11550	10440	10500	10860	11960	12380	12380	12380
(déficit) excédent					(9060)	(5940)	(1500)	1140	6040	8620	8620	8620
Nombre de jours/homme					17700	17100	17400	19200	22800	24600	24600	24600

1/ Rendement maximum
2/ 250 FCFA par homme/jour
3/ Année du projet

ANNEXE 1

Tableau 2

BENIN

PROJET AGRICOLE DE HINVI

EVALUATION RETROSPECTIVE DU TAUX DE RENTABILITE ECONOMIQUE
(aux prix constants de 1976)

	68/69	70	71	72	73	74	75	76	77	78	79	80
Valeur brute de la production supplémentaire												
ffb (13 frs)					4,8	56,3	85,2	216,8	332,3	403,9	521,5	552,5
Maïs (25)							37,1	37,1	37,1	37,1	37,1	37,1
Arachides							7,1	7,1	7,1	7,1	7,1	7,1
Niébé							0,6	0,6	0,6	0,6	0,6	0,6
Coton							0,9	0,9	0,9	0,9	0,9	0,9
Tecks/cassiers												
Bétail												
Total partiel					4,8	56,3	130,9	262,5	378,0	449,6	537,2	598,2
Coût du projet	448,9	181,2	196,6	403,4	705,5	175,8	112,8					
Remplacement de l'équipement										40	40	40
Entretien des palmeraies					10,8	21,6	36	36	36	36	36	36
Entretien des cultures annuelles							17,4	17,4	17,4	17,4	17,4	17,4
Coût de la main d'oeuvre						10,6	21,0	34,8	38,4	42	45,6	49,2
Gestion des coopératives						9,2	18,4	30,6	30,6	30,6	30,6	30,6
Total partiel (aux prix courants)	448,9	181,2	196,6	403,4	716,3	217,2	205,6	118,8	122,4	166,0	169,6	173,2
Aux prix courants de 1976	982,3	370,5	378,8	714,0	1069,1	264,9	214,4	118,8	122,4	166,0	169,6	173,2

ANNEXE 1
Tableau 3

BENIN

PROJET AGRICOLE DU GRAND HINVI

HUILERIE D'HINVI: COUT D'INVESTISSEMENT

(Millions Francs CFA)

	1971	1972	1973	1974	1975	Total
HUILERIE (installation d'ensemble)						
Huilerie (y compris travaux de génie civil)		194.2	479.9	71.5		745.6
Routes d'accès		1.6				1.6
Bâtiments auxiliaires			15.5			15.5
Réseau électrique et canalisations d'eau			1.3	5.3		6.6
Outillage					11.8	11.8
Matériel de bureaux			0.3		0.6	0.9
Lignes téléphoniques			8.5			8.5
Puits abyssinien		21.6				21.6
Pompes				9.8	0.2	10.0
Chateau d'eau			33.5			33.5
Assistance technique	1.9	1.6	0.8	0.5	3.3	8.1
Total Huilerie	1.9	219.0	539.8	86.1	15.9	862.7
VILLAGE						
Habitations		10.2	4.7		1.2	16.1
Adductions d'eau			13.1	1.1		14.2
Ligne électrique			10.3	12.0		22.3
Total Habitations		10.2	28.1	13.1	1.2	52.6
MATERIEL DE TRANSPORT						
Chariots d'élevation		3.9				3.9
Véhicules		0.7				0.7
Camions-bennes		11.8				11.8
Camions-citernes				11.7		11.7
Tracteurs et remorques				13.5	5.8	19.3
Total Vehicules		16.4		25.2	5.8	47.4
GRAND TOTAL:	1.9	245.6	567.9	124.4	22.9	962.7

BENIN

ANNEXE 1
Tableau 4

PROJET AGRICOLE DU GRAND HINVI

Pluviométrie dans la région du projet (par trimestre), montrant la récolte annuelle
Chiffres donnés par Coopérative (Plantation)

	Sedje	Koundokpoe	Dodji Gbeto	Agbotagon	Attogon Dessa	Zegoulo	Adjan	Hanafin	Dodji-Sehe	Kpoe-Kpannon	Moyenne annuelle
1969.3	225.7	211.5	153.9	258.2	142.6	170.1	222.2	169.1	200.8	156.3	10 Cooperative
.4	234.9	295.2	189.9	173.2	272.2	220.1	289.6	275.3	210.6	207.1	
1970.1	108.1	127.1	127.1	134.5	164.4	94.7	95.3	198.2	104.5	139.1	
70.2	528.9	503.5	386.9	699.7	495.5	507.1	478.2	649.3	442.5	464.2	
	1,097.6	1,137.3	857.8	1,265.6	1,074.7	992.0	1,085.3	1,291.9	958.4	965.7	
1970.3	98.1	157.3	126.1	151.3	117.5	144.4	153.1	106.0	136.3	139.1	1,071.6
4	325.7	212.4	320.1	285.3	186.8	302.2	238.2	267.7	265.5	237.9	
1971.1	95.9	156.9	179.5	183.2	188.5	168.9	175.4	258.3	193.3	114.6	
1971.2	453.6	442.1	308.9	297.3	295.7	417.7	348.7	439.5	200.4	271.3	
	973.3	968.7	934.6	917.1	788.5	1,033.2	915.4	1,071.5	795.5	762.9	
1971.3	172.5	246.7	204.9	268.9	149.4	248.0	203.9	246.0	250.9	246.4	916.1
.4	40.1	96.6	94.9	87.4	120.7	72.9	46.8	149.1	132.1	39.9	
72.1	141.6	166.1	260.0	216.5	223.9	182.6	189.9	116.9	258.7	146.6	
2	510.3	541.5	506.7	728.9	513.3	515.9	509.5	647.8	536.3	552.9	
	864.5	1,050.9	1,066.5	1,301.7	1,007.3	1,019.4	950.1	1,159.8	1,178.0	985.8	
1972.3	208.8	182.2	143.4	234.8	138.8	234.0	175.6	231.9	128.5	148.6	584.0
.4	74.5	151.3	105.6	102.9	53.7	74.9	94.2	108.2	81.4	122.4	
73.1	42.1	97.9	80.0	56.1	54.4	71.9	93.1	70.7	103.7	96.9	
.2	270.4	277.4	270.5	400.0	224.4	506.3	217.4	328.1	223.7	284.2	
	595.8	708.8	599.5	793.8	471.3	887.1	580.3	738.9	537.3	652.1	
1973.3	429.8	340.5	292.0	375.7	288.6	518.3	453.4	342.2	340.7	281.5	656.5
.4	95.8	236.7	164.4	250.5	133.7	146.1	89.3	209.7	256.9	132.8	
74.1	91.7	114.9	143.3	120.1	125.5	90.6	102.4	96.6	145.5	181.3	
.2	386.9	444.7	462.9	537.0	473.9	468.2	515.3	517.4	476.9	442.9	
	1,004.2	1,136.8	1,062.6	1,383.3	1,071.7	1,223.2	1,074.3	1,165.9	1,220.0	1,037.9	
1974.3	290.4	408.1	325.5	325.6	299.0	335.2	356.3	432.0	325.5	432.0	1,028.4
.4	61.4	163.9	189.0	198.2	165.4	85.2	90.4	115.8	127.5	247.9	
75.1	58.5	154.8	93.0	173.2	51.7	152.0	133.3	151.6	84.0	96.6	
.2	407.0	567.4	572.1	643.9	462.6	522.8	525.2	575.8	533.5	529.2	
	817.3	1,294.6	1,189.6	1,340.9	1,078.7*	1,145.2*	1,109.8	1,272.9*	1,179.0	1,253.5*	
Moyenne 10 ans	892.1	1,047.9	951.8	1,167.1	915.4	1,050.0	952.5	1,116.8	795.0	943.0	983.2

Note: Ces chiffres proviennent des rapports trimestriels fournis par la SONADER, à l'exception de ceux pour les 3ème et 4ème trimestres 1974 qui ont été relevés d'après des tableaux de Boagerts. Les chiffres correspondent, à l'exception de ceux marqués d'un astérisque, au chiffre total annuel indiqué par SONADER.

BENIN

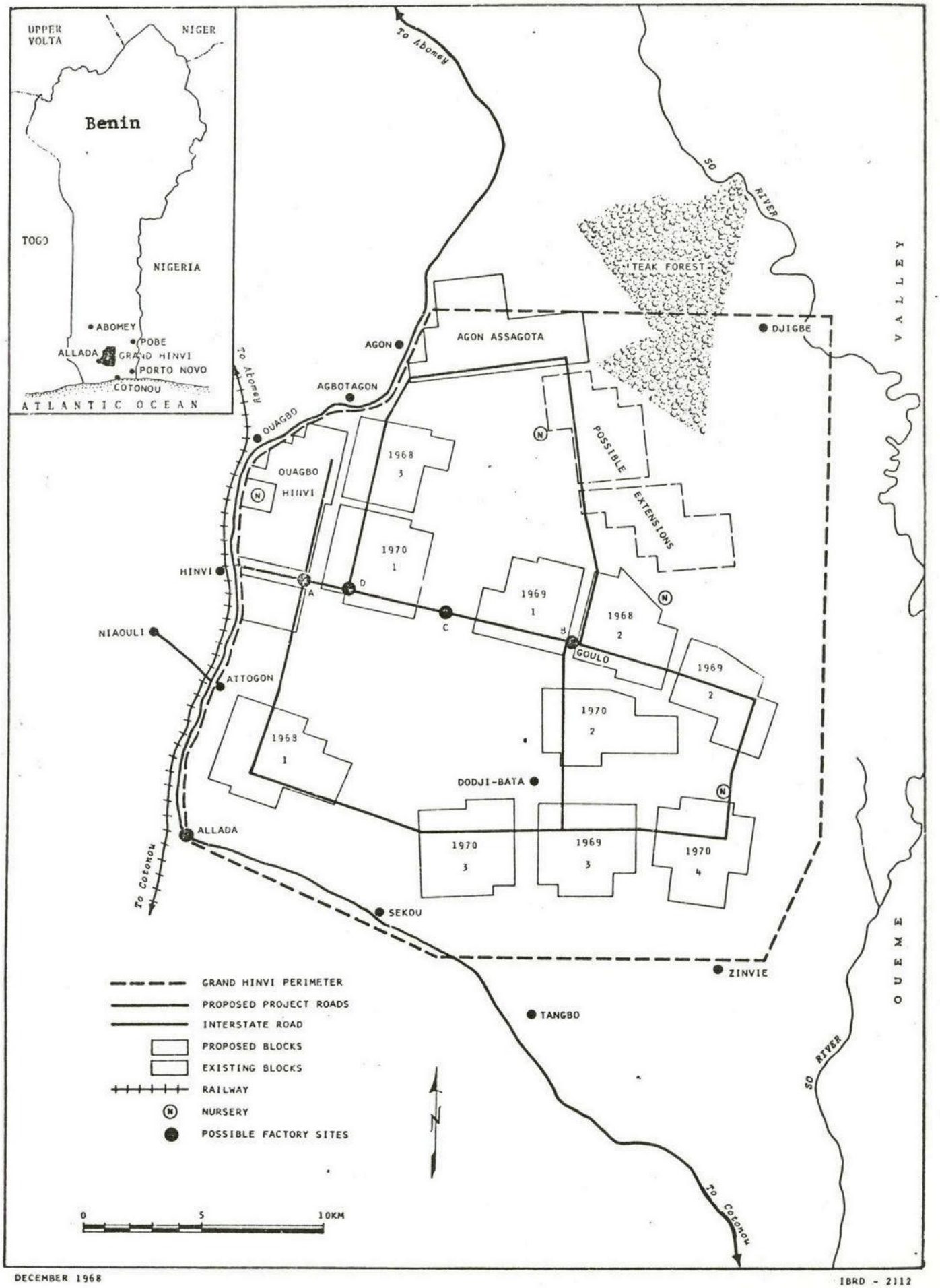
Projet d'Hinvi

Tableau 5: Rendement en régimes de fruits frais, tonnes/ha

	64/5	65/6	66/7	67/8	68/9	69/70	70/1	71/2	72/3	73/4	74/5	75/6
Hinvi	Planté								3.0	4.5	4.5	
Ovagbo		Planté							2.4	4.5	4.2	
Agon			Planté							2.6	6.1	
Assa-Gota			Planté							2.3	5.0	
Agbotagon				Planté						1.9	2.6	
Attogon				Planté						0.7	2.5	
Goulo				Planté						2.3	1.9	
Koundokpoe					Planté					0.2	1.9	
Sedje					Planté						1.1	
Dodji					Planté						0.6	
Sehe						Planté						
Hanafin						Planté						
Adjan						Planté						
Kpoe						Planté						

BENIN

HINVI AGRICULTURAL DEVELOPMENT PROJECT



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