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Benin: Hinvi Agricultural Project. Background Documents, Cr 144 - BEN

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WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. André Gué, Director WAP

DATE: March 11, 1977

FROM: Klaus Berg, Chief, WAPA2

SUBJECT: BENIN: Hinvi Agricultural Project (Credit 114-DA)
Completion Report

Please find attached the Completion Report for the Hinvi Agricultural Project.

JTillier:gtm

cc: Messrs. de la Renaudière, Chaffey, Pouliquen, van Gigch, King, Palein (Cameroon), Geli (RMWA), van der Tak (3), Yudelman (2), McGibbon (Ghana), Carter (Mali). Reitter (Nigeria), El Maaroufi (Upper Volta), Chittleburgh, Elliott, Kapur(4), Rothenbühler. Ms. Eschenbach.
West Africa Files.

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BENIN
HINVI AGRICULTURAL PROJECT
CREDIT 114 DA
COMPLETION REPORT

[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	1973	-	-	-	46	-	-	-	599			
Seed	1974	-	-	-	-	-	-	-	500			
otton)	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 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. The rate of return on the project has been re-calculated 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.

V. ECONOMIC RESULTS

5.01 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.

5.02 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	

5.03 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

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

5.05 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.

5.06 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.

5.07 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.

ANNEX I
Table 1

BENIN

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	24600

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	208.8	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. These 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	75/6
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						