

Département territoires,  
environnement et acteurs  
Cirad-tera

## **Support to irrigated scheme Management and Organization**

Hadejia Valley Project  
(Nigeria)

CIRAD-TERA n°12/98

**J. PAGES  
B. LIDON  
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<b>A - FRAMEWORK OF THE MISSION</b> .....	1
<b>A1- Introduction - Reminder of the framework</b> .....	1
<b>A2- Performance of the mission</b> (cf. schedule annexed) .....	1
<b>B - PROGRESS OF THE PROJECT AND PROSPECTS FOR 1998</b> .....	2
<b>B1 - The present situation</b> .....	2
<b>B2 - Prospects in training</b> .....	4
❶ Production techniques in an irrigated environment .....	4
❷ Conditions of operation of the perimeter .....	4
❸ Transfer of technical innovations .....	5
<b>B3 - Monitoring and evaluation</b> .....	5
<b>C - IMPLEMENTATION OF THE PROGRAMME</b> .....	7
<b>D - OPERATION SCHEDULE</b> .....	8
<b>E - BUDGET FOR THE OPERATIONS</b> .....	8



## A - FRAMEWORK OF THE MISSION

### A1 - Introduction - Reminder of the framework

This mission is part of the collaboration undertaken in 1995, at the request of the French Embassy in Lagos, between CIRAD and the Hadejia Jama'are River Basin Development Authority (HJRBDA) based in Kano.

The purpose of the collaboration is **assistance for the operation of a hydro-agricultural project, the Hadejia Valley Project (HVP).**

Performed using joint funding from France and Nigeria by the Nigerian subsidiary of the French company BEC Frères, this 2,500-ha development was put into operation by the traditional users of the land under the supervision of HJRBDA. CIRAD's intervention follows the difficulties observed in field management, network maintenance and more generally in the adoption of new patterns of organisation made necessary by the changes resulting from the irrigation of the land.

*A first mission* in October 1995 made it possible to define a framework for collaboration concerning the training of farmers, supervision and extension structures and the Basin Authority responsible for the allocation and management of water resources.

The National Agricultural Extension and Research Liaison Services (NAERLS), a local training establishment linked to Ahmadu Bello University in Zaria, has been involved in the project to provide training in the field according to the programme drawn up and supervised by CIRAD.

*A second mission* was performed by CIRAD in December 1996 and led to defining, in collaboration with HJRBDA and NAERLS, the practical procedures for the partnership, the progress of the training programme and the methodology to be used to transfer knowledge to farmers. The BEC company provided logistic support for this initiative.

The programme that was agreed to was then monitored throughout 1997 by NAERLS, assisted by HJRBDA and BEC.

*The third mission* by CIRAD is the subject of this report and was aimed at :

- evaluating the impact of the operation undertaken ;
- proposing a programme for future intervention according to the results achieved, the difficulties encountered and the orientations desired by the project participants ;
- contributing to the establishment of supervision structures for hydraulic questions and water management.

### A2 - Performance of the mission (cf. schedule annexed)

The mission performed by 3 CIRAD experts took place from 16 October to 8 November 1997.

Numerous contacts were made with local structures such as HJRBDA, HVP, BEC Frères Ltd in Kano, NAERLS in Zaria, the Irrigation and Drainage Department of the Federal Ministry of Water Resources in Abuja and the French Embassy in Lagos made it possible to envisage a new programme of collaboration.

Field visits, talks with farmers and training sessions provided by CIRAD staff led to drawing up a balance of the ongoing operations and to redefine HVP's on-site training programme.

## B - PROGRESS OF THE PROJECT AND PROSPECTS FOR 1998

On completion of the mission, in addition to a preliminary balance of the operation in progress, the collaboration undertaken was redesigned in accordance with two types of intervention: intervention adapted to the problems of operation of the HVP perimeter and, in a broader framework, assistance with the management of the irrigated perimeters in northern Nigeria. This assistance will be the subject of a joint action project by CIRAD and the Federal Ministry for Water Resources to be drawn up in 1998.

Collaboration concerning the HVP site will concern training operations re-oriented in relation to the initial projects in order to strengthen the organisation of farmers at HVP and monitoring-evaluation operations to provide decision-making tools for the various groups involved in the irrigated developments: farmers, water users' associations, supervision structures, Catchment Authority and political decision-makers.

### B1 - The present situation

The training programme drawn up by CIRAD in concertation with HJRBD/HA and NAERLS was aimed mainly at making the various perimeter participants aware of the new potential and constraints induced by irrigation in their farming methods traditionally based on rainfed crops.

*In the new potential*, stress was to be laid on :

- increasing cropping intensity with two crop cycles per year : one rainfed crop and one irrigated counterseason crop ;
- broadening the range of crops, with the introduction of high value added cool season crops such as vegetables or crops such as wheat to complement the cereal-based diet .

*The constraints included* the need to make farmers feel responsible for the maintenance and management of conveyance and drainage networks and certain imperatives concerning the collective organisation of production.

These objectives were attained as a whole and the project situation developed very positively from October 1995 to October 1997.

☞ With regard to farmers' attitudes to the new opportunities, the application of rice growing to nearly 80 % of the perimeter is a clear sign of the deep-seated change in cropping systems and the adoption of irrigation. Indeed, under the climatic conditions of the Hadejia region, rice can only be grown with use of supplemental irrigation and no farmer would have tried it in the traditional system.

In addition, although some newly developed sectors and the Auyo sector have not been fully cultivated during the dry counterseason, it is more for technical reasons (the availability of irrigable land or labour at the beginning of the season) than through choice of crop or insufficient knowledge of techniques. However, the latter features had hindered the development of irrigated crops two years previously.

In some fields, observations of the general state of the crops, confirmed by the data collected by HVP supervisory staff, lead to forecasting excellent production with rice yields of nearly 7 tonnes per hectare.

A few fields in some sectors such as that of Zumoni are used for vegetable crops (tomatoes and pimientos). This is the result of farmers' decisions related to the knowledge that they have gained of their fields under irrigation and the effect on yields. In contrast with 1995 observations when the farmers tended to avoid irrigation in favour of dryfarming, particularly in zones with light soil, irrigation has now been kept as a production technique at the price of changes in farming practices and cropping systems.

Most of the farmers met in the Gamsarka, Zumoni and Auyo perimeters said that they intended to grow a wheat crop after the rice harvest. Wheat is a new crop insofar as the position of the wheat cycle in the year makes it impossible to grow under rainfed conditions.

☞ Substantial progress has also been made with regard to the constraints of irrigation.

Farmers operating alone have performed some maintenance of the field channels. The making of cuts in the channel banks is still observed but it is now often related to problems of availability of water. Two years before, it had been frequent among the rare farmers to use irrigation and was applied above all instead of siphons, that were considered to be difficult to use.

The maintenance of secondary infrastructure is beginning to be taken into account through Water Users Associations (WUA). These groups have been formed and are of increasing importance for the functioning of the perimeter. In addition to these network maintenance operations that they initiate and manage, the groups are also active in other fields. Thus, bank decisions to award credit depend on the submitting of files through the WUAs. The system is a recent one and concerns few farmers so far (in the Gamsarka sector in 1997, only 4 applications for credit were accepted of about 50 submitted). Nonetheless, it strengthens the image of the WUAs and the role that they can play in representation and the guarantee that they form for third parties. They also have a role in the negotiations between farmers and providers of services in field preparation.

Although the observations above reveal substantial changes in farmers' practices, there are still difficulties with regard to adaptation of the new practices to the agro-environmental conditions (soil, climate, availability of water) and improvement of farmers' knowledge. The latter have been brought to a stage that enables them to decide to grow new crops. They are not yet equipped—either in terms of knowledge and physically—with the tools that will help them to solve the problems raised in the management of these crops.

With regard to production, and in spite of the high yields expected, some producers' practices should be reconsidered with a view to the economically and agronomically sustainable development. Thus although application of fertiliser with poor control of formulations, the total amount placed and the rate and cultural stage of the operations may have a limited effect in the early stages of the development area, it is a threat for the increase in production levels and the chemical and biological characteristics of the substrate.

Likewise, failure to carefully maintain embankments, channel banks and often the crop itself results in weed growth. This problem can be solved fairly easily today, but if no serious action is taken, there is a risk that the spread of weeds may finally make it necessary to use chemical control, which is expensive and has effects on the environment.

Decisions concerning the maintenance of infrastructure are still taken without a proper basis. A degree of scheduling of the operations according to the type of work, its urgency and the level of responsibility should be performed.

The role of the WUAs should be strengthened with regard to the organisation of farmers. Recognition of the associations both by the farmers and by the project partners (commercial institutions, credit institutions, political decision-makers, etc.) is a necessity. This recognition should be accompanied by more professional operation of the associations, whose managers should be aided. The rights and duties of the WUAs, internal regulations, management procedure, contractual relations with third parties, etc. are all notions that must be mastered by these managers.

These considerations lead us to proposing a strengthening of the training programme that forms the basis of the present collaboration between CIRAD and HJRBDA.

## **B2 - Prospects in training**

The training programme envisaged seeks to meet three main objectives :

- improvement of the level of farmers' knowledge concerning production techniques under irrigation ;
- improvement of the conditions of operation of the perimeter ;
- assistance for supervisory staff in the transfer of technical references to the farmers.

As in the previous phase, the programme will have three targets: farmers (via the supervisory structures) ; the supervisory and technical support structures and the managers of the perimeter.

### **❶ Production techniques in an irrigated environment**

The themes presented in the preceding programme: types of crop, choice of plant material, use of inputs, crop maintenance, etc. will be covered in greater depth. Special emphasis will be laid on the impact of the choice of variety and, in rice growing, the cycle length, susceptibility to pathogens (especially in the case of blast) and yield variability. Likewise, the effect of weeding on production levels should be shown through comparisons of crop management sequences between neighbouring farmers.

The introduction of diversification crops (potato, pigeon pea, tomato, etc.) will be performed at demonstration plot level.

The bases of the economic calculations to compare production costs and the return on crops must be provided for farmers and the Water Users Associations.

### **❷ Conditions of operation of the perimeter**

These are based on the gaining of knowledge about both the technical management of the infrastructure (functioning of the gates and regulators, maintenance of the networks and storage facilities, maintenance of access tracks) and on support for farmers within the framework of the Water Users Associations.

The technical aspects of the functioning of the works in relation to crop water requirements, farmers' technical choices and the characteristics of the water resource and the development must be covered.

At the same time, the operating rules of an Association will be drawn up in concertation with farmers and the HVP. The committee members will receive basic training in management and the leading of groups.

This aspect of training will be based on comparison of experience with similar organised structures in other perimeters in Nigeria and also in Niger.

#### ④ Transfer of technical innovations

The transfer of an innovation to farmers via the supervisory structures requires a prior phase of appraisal and identification of the production constraints at cultivated field level.

Extension agents must therefore first be trained in observation of farmers' practices and their effect on the crops. They must be able to draw up a diagnosis of the state of the plants, relations between practices, agro-environmental conditions and production results. They should then be capable of identifying the organisational, technical and economic constraints and, in close collaboration with farmers, design scenarios aimed at alleviating these various constraints. They will guide farmers' decisions in choosing the scenario best-suited to their specific conditions and objectives and will aid them in putting it into practice.

This process assumes that supervisory staff should not only possess references for production techniques but also tools for diagnosis, including observation of the environmental conditions of a crop or the physiological state of the plants, the components of yield constitution and knowledge of crop quality according to marketing requirements. Techniques of interviewing farmers will also be addressed.

The monitoring of farmers' fields will contribute substantially to this component of training.

### **B3 - Monitoring and evaluation**

It is necessary to evaluate the results of the training operations described above and more generally those of the functioning of the HVP project in order to guide the decisions made by all those involved in the perimeter.

Indeed, at the end of the first phase, it is fairly easy to examine the changes that have taken place during the past two years as they are significant. However, examination will become increasingly difficult and a system should be set up to observe the changes in real time. The information generated can then be used to guide the management or operation of the perimeter.

For this, it would seem necessary from today to identify a number of pertinent indicators that are representative of the perimeter at a given moment and to monitor their changes.

The indicators will be set in such a way as to reflect the different facts of the development: hydraulic, agronomic, economic and organisational.

The monitoring and analysis of the indicators will make it possible to evaluate the performances of operation of the perimeter, the difficulties encountered and their effect on results and trends.

This approach involves generating awareness of the supervisory structures and farmers within the framework of the WUAs. In addition, the managers of the HVP project will be closely involved in the monitoring and study of these criteria in order to be able to intervene in the functioning of the whole at the right moment.

#### ► **Demonstration of monitoring-evaluation**

In order to familiarise both the authorities and the perimeter supervisory services with this monitoring-evaluation procedure, it will be applied to an hydraulic grid. At this level, the demonstration will cover the definition of monitoring indices, the formation of the database, readings and data entry and analysis of graphic representations on a digitised diagram of the grid. Interpretation of this information in terms of the functioning of the network and production results will also be performed. This should lead in particular to identification of management and maintenance problems in the grid.



In practical terms, it will consist of :

- setting up a **database on the physical and agricultural characteristics** of the fields in each sector. This database will be assembled manually in 1998 using a systematic survey in the 8 sectors of the perimeter. It will be used by means of a GIS program that provides a graphic representation of the data collected for each field or portion of the hydraulic network. So as not to make the data gathering phase too burdensome, it will consist essentially of recording data on the crops grown by each irrigation unit and their area and the average planting/sowing dates. It is then planned for 1999 to gather information concerning farmers' names, their status, the type of crop, varieties, sowing dates, cycle length, etc.

The data will then be sorted, cross-referenced or grouped and the water requirements of the different crops evaluated.

The information collected will be assembled in a table and each collection point georeferenced, forming a datum linked to a cartographically identified zone as in the table below provided as an example.

plot reference	farmer name	area	crop	variety	sowing/ plantation date	fertilizer	weed control	yield	observations
$(x_1, y_1)$	-	-	-	-	-	-	-	-	-
$(x_2, y_2)$	-	-	-	-	-	-	-	-	-
.....	-	-	-	-	-	-	-	-	-
$(x_n, y_n)$	-	-	-	-	-	-	-	-	-

The 'demand' corresponding to these water requirements can be approached at several levels : crop, sprinkler irrigation unit or hydraulic grid. It will be used to adjust water availability through the management of the infrastructure and of watering.

- setting up a second **database on the physical characteristics of the irrigation and drainage networks, the main hydraulic works and roads and tracks.**

The second database will be reserved for data on hydraulic and road infrastructure only. Sections of canals and tracks and the hydraulic works in the grid in question will be georeferenced. The record of the state of these different structures at different periods will enable appraisal of the changes in their conditions of operation and any degree of deterioration. A cartography program can be used to plot the grid and its networks. Evaluation will be performed of any technical failure and constraints in hydraulic management and/or organisation and a comparison made with the previous information in order to draw up rules for user behaviour with regard to network maintenance.

The information collected and processed in this way will enable better adjustment of the demand by users associations to meet crop water requirements over the year and the water provided in relation with the management of the offtake in Hadejia River, regulation of the level in the main feeder, the distributaries and the distribution works, etc.

It will thus form a tool for aid in discussion and negotiation with a view to improvement of operation and maintenance of the irrigation and drainage networks.



The presentation and discussion of the results and diagnoses of agricultural performances and the state of the networks that they enable will be handled jointly by the HVP authorities and farmers associations.

Through this aided self-assessment, farmers will be able to evaluate the main practices or constraints that contribute to the present performance of their fields. Group comparison (assisted by the advisory unit formed by CIRAD, HVP and the NAERLS, associated with this phase) of individual strategies and performance will make it possible to identify for each farmer (or farmer category) the technical, strategic or organisational innovations that are likely to contribute to improvement of performance at field, farmer or perimeter level.

This approach combining HVP and the WUAs will enable joint analysis of the state of infrastructures, definition of the budget and the joint proposal of a programme of works according to the priorities retained. The budget drawn up can also be used in calculation of the level of irrigation fees.

## **C - IMPLEMENTATION OF THE PROGRAMME**

With regard to training, the second phase of intervention by CIRAD in the HVP project will be performed in a very similar manner to the first.

It will be supported by Ahmadu Bello University in Zaria through NAERLS. A Memorandum of Understanding (MOU) defining the responsibilities of CIRAD and NAERLS and showing the financial support of the French Ministry of Foreign Affairs via the French Embassy in Lagos will be drawn up and signed by the parties. HJRBDAs will provide support for the programme with regard to both human resources by involvement in the field of the structures managing the project, and also financially through a contribution to the holding of the PRAT meeting, the publishing of leaflets, operation of pilot plots, etc. and in logistics (transport facilities for the technicians). The BEC company has also agreed to provide logistic support, especially for the holding of classroom training sessions and for the accommodation of NAERLS personnel at Hadejia.

Although there are still theoretical training sessions in this second phase, stress will nevertheless be laid on practical sessions in the fields in partnership with farmers and WUAs. With regard to methodology, comparisons between farmers' fields will be used to show the impact of differences in the environment or practices on production. Agreements with farmers will also make it possible to use these on-farm fields for improving the practices used for 'classic' crops. The demonstration fields will concern above all new crops to awaken farmers' interest and to guide them in the choice of new crops.

Demonstration of monitoring-evaluation of the functioning and results of production of an hydraulic grid and the related fields will be performed using data gathered at the HVP site under the control of one of the perimeter officials who will be trained for the purpose. The training will be provided in France in the CIRAD laboratories where the first information collected using a set of sheets drawn up with the assistance of CIRAD and completed in the field can be processed.

The digitising by CIRAD of a portion of the perimeter will make it possible to display the data cartographically and to perform the preliminary design of a tool for the management of the perimeter.

The training programme of this manager will subsequently include a stay in Senegal with the CORAF research centre on Sudan-Sahelian irrigated systems where he will learn how to use the Geographical Information System / Database (GIS/DB) facility on a broader scale and the potential that it can have for application to the HVP project. He will also profit from this stay to

compare experience in Nigeria with that of the Senegalese structures for the management of irrigated perimeters.

Finally, the missions by CIRAD experts in 1998 will also be aimed at providing support for specific training subjects, evaluating ongoing operations and setting up the monitoring-evaluation operation. They will also contribute to the scheduling of intervention by NAERLS in the subsequent phases.

#### **D - OPERATION SCHEDULE (cf. Annex)**

The training programme drawn up in collaboration with NAERLS and HVP and included as an annex must be started at the beginning of 1998 when the dry season crops are in full growth. The holding of a PRAT meeting is planned towards the end of the first quarter and there must be substantial media coverage of the event.

Subsequently, a trip should be arranged to Niger for WUA officials to meet their counterparts in farmers' organisations.

Training of the Nigerian manager appointed by HJRBDA will be carried out in June for the French part at the CIRAD laboratories in Montpellier and then in Senegal in collaboration with the PSI (irrigated system operation).

The CIRAD missions planned in the last quarter of 1998 will be aimed at helping NAERLS in its training programme, especially with regard to aspects concerning the monitoring of perimeter functioning indicators and the gathering, entry and processing of data for cartographic representation of information. A mission is also scheduled for assistance to farmers and supervisory structures in the practical use of GIS/DB tools for management of the perimeter. A last, shorter mission will be performed for the evaluation of the programme of operations described above and to finalise the operation schedule planned for other perimeters with the Ministry for Water Resources.

#### **E - BUDGET FOR THE OPERATIONS (cf. Annex)**

The budget presented corresponds to the funding request from the French Ministry of Foreign Affairs via the French Embassy in Lagos. It also mentions the financial contributions of the various partners involved in the project: HJRBDA/HVP, NAERLS, BEC and CIRAD.

The total budget of the operation has been estimated at approximately FRF500,000 for 1998, including FRF350,000 on the Ministry of Foreign Affairs budget.

**Mission schedule.**

- 16 October: J. PAGES travelled from Montpellier to Kano  
met by M. Fix of the company BEC Frères, Nigeria
- 17 October: meeting with Mr Le Man, director of BEC Frères, Nigeria: situation of the HVP project.  
Meeting with the engineer I.K. Musa, Irrigation and Drainage Director of the Federal Ministry for Water Resources: examination of a project for collaboration between CIRAD and the Federal Ministry.  
journey from Kano to the Hadejia Valley Project  
field visit with Mr Musa: observations.  
return to Kano
- 18 October: meeting with Messrs J.O.A. Abifarin, Assistant General Manager, and Mr Kura, Assistant Chief Agricultural Officer of the Hadejia Jama'are River Basin Development Authority : drawing up of a schedule of work.
- 19 October: Kano
- 20 October: journey from Kano to Zaria  
meeting with Messrs Umaru, Assistant Director, S.Z. Abubakar, Project Coordinator, and G.B. Murtala, of the National Agricultural Extension and Research Liaison Service (NAERLS) of Ahmadou Bello University : progress of CIRAD - NAERLS collaboration; project for its continuation.  
Return to Kano.
- 21 October: visit to HJRBDA  
meeting with Mr A.I.A. Abubakar, Executive Director Services, and Mr H. Kura.  
Journey from Kano to Hadejia  
field visit (Gamsarka) with Mr G.B. Murtala (NAERLS): observations, meetings with farmers.
- 22 October: field visit (Yamidi) with Messrs. G.B. Murtala (NAERLS) and A. Gharba, manager of the extension staff of the Hadejia Valley Project (HVP): observations, meetings with farmers.  
meeting with Mr Malam Zakari, deputy director of HVP.  
Field visit (Zumoni) with Messrs G.B. Murtala (NAERLS), A. Gharba (HVP) and M. Kura (HJRBDA): observations, discussions with farmers.
- 23 October: - discussions in the field with officials of the Gamsarka and Zumoni Water Users Associations (WUA): evaluation of the training provided within the framework of CIRAD - NAERLS - HVP collaboration, proposals for continuation and support for the WUAs.  
discussions at the BEC camp with local HVP project officials and representatives of HJRBDA and NAERLS. Identification of training requirements in water management. Proposal of a training programme for 1998.  
Field visit (Auyo) with Messrs G.B. Murtala (NAERLS), A. Gharba (HVP) and

Mr Kura (HJRBDA). Observations and discussions with farmers.  
- arrival of B. Lidon from Montpellier via Paris and Amsterdam.

- 24 October: - journey from Hadejia to Kano (JP)  
meeting with M. Kazaure, HVP project manager, and M. Kura. Implementation of CIRAD - NAERLS - HJRBDA collaboration, and especially of training sessions abroad organised by CIRAD. ( Montpellier and PSI - Niger). Programme of the training to be provided by CIRAD at the site (JP)  
- journey from Kano to Hadejia (BL)  
field visit (BL)  
journey from Hadejia to Kano (BL).
- 25 October: journey from Kano to Zaria (JP - BL)  
meeting with Mr S.S. Abubakar, Chairman of NAERLS. Revision of the Memorandum of Understanding between CIRAD and NAERLS. Formulation of a programme of collaboration for 1998. Visit of NAERLS installations (JP - BL).  
Return to Kano (JP - BL)
- 26 October: journey from Kano to Lagos (JP)
- 27 October: - meeting with Mr Pelletier, French Ambassador to Nigeria, Messrs Erouard, cultural advisor, and Aumis, cultural attaché of the embassy, and Mr Le Man. Continuation of CIRAD activities in northern Nigeria ; prospects for extension; proposal for 1998 (JP).  
- journey from Kano to Zaria (BL)  
training sessions on hydraulics and water management (BL).
- 28 October: - return from Lagos to Kano (JP)  
working session in Kano (JP)  
- training sessions at HVP on hydraulics and water management (BL).
- 29 October: - journey from Kano to Abuja (JP)  
working meeting with Mr I.K. Musa, Federal Ministry for Water Resources. Return from Abuja to Kano. Proposal of assistance from CIRAD for several catchment authorities (JP)  
return from Abuja to Kano (JP)  
- training sessions at HVP on hydraulics and water management (BL).
- 30 October: - journey from Kano to Hadejia (JP)  
working session with Messrs Musa, Abubakar and Kazaure (JP, BL)  
return from Hadejia to Kano (JP)  
Departure for Montpellier via Amsterdam and Paris (JP)  
- training sessions at HVP on hydraulics and water management (BL).
- 31 October: - arrival in Montpellier (JP)  
- training sessions at HVP on hydraulics and water management (BL).  
return from Hadejia to Kano (BL)
- 2 November - journey from Dakar to Lagos (J.C. Legoupil)  
- journey from Kano to Hadejia (BL)

- 3 November
  - arrival in Kano (JCL)
  - journey from Kano to Hadejia (JCL)
  - participation at a PRAT meeting with NAERLS, HJRBDA, HVP and Hadejia Valley Project farmers (BL, JCL).
- 4 November
  - meeting with Mr Abdulkadir, Director of HJRBDA (JCL, BL)
- 5 November
  - drawing up training aids (BL)
  - drawing up a programme of operations for 1998 with Messrs Kazaure and Kura.
- 6 November
  - finalisation of the project (BL, JCL)
- 7 November
  - Departure for Montpellier via Amsterdam and Paris (BL)
  - journey to Lagos (JCL) Contacts with the French Embassy
- 8 November
  - departure for Dakar (JCL)

Operation scheduling 1998

Annexe  
HVP 98

	NAERLS	HVP	CIRAD
January	traini ng	mission abroad	
February			
March			mapping
April			flow-up support preparation
May			
June			
July			
August			
September			missions
October			missions
November			
December			missions

**Previsionnal budget- CIRAD assistance to HVP year 1998**

Funding supported by French Embassy

<b>1 - Training sessions run by NAERLS (according to proposal enclosed)</b>		<b>50 000,00 F</b>
<b>2 - Nigerian staff training abroad</b>		<b>84 000,00 F</b>
Training scholarship	24 000,00 F	
Training expenses in Senegal	15 000,00 F	
Training expenses in France	30 000,00 F	
Air trips	15 000,00 F	
<b>3- Mapping works</b>		<b>6 000,00 F</b>
<b>4- Infrastructures (computer, printer, software)</b>		<b>32 000,00 F</b>
<b>5- CIRAD experts' missions</b>	jours	<b>182 000,00 F</b>
initiation and training (GIS/DB,,,	28	124 000,00 F
monitoring/assessment	10	46 000,00 F
Project proposal preparation	5	12 000,00 F
<b>TOTAL</b>		<b>354 000,00 F</b>

## BUDGET PROPOSAL FOR 1998

### A CIRAD Operation Budget- Funding MAE /Ambassade de France in Lagos

#### A1 *Support missions and training*

FF

1	HVP project leader training abroad( France and Senegal) 2*2 weeks.	84 000
2	Support mission and training on GIS and Data Base 2 weeks.	62 000
3	Support mission and training . Scheme operation. Negotiation with actors 2 weeks.	62 000
4	Training mission on monitoring-assessment 10 days.	46 000
5	Check-up and programming mission 5 days.	12 000
6	HVP map digitalization.	6 000
<b>Total</b>		<b>272 000</b>

#### A2 *CIRAD* equipments

FF

1	Software for data bases and GIS	8 000
2	Data processing and mapping equipments (PC computer + color printer + softwares).	24 000
<b>Total</b>		<b>32 000</b>

### B NAERLS Operation Budget - Funding MAE /Ambassade de France in Lagos

#### B1 *Training programme implementation*

		₦ <sup>(1)</sup>	FF
1	Trainers Out station allowance (OSA) 120 man days ; base : 2 000 ₦ / day.	240,000	17 140
2	Drivers Operation Budget (OSA) 120 man days; base : 500 ₦ / day.	60,000	4 290
3	Contribution to transportation with NAERLS car (vehicle fuelling) 18 trips ; base : 5 000 ₦ / trip.	90,000	6 430

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<sup>1</sup> (Taux de change utilisé 14₦ = 1 FF)



4	Trainers honoraria.	35,000	2 500
5	Establishment and management of demonstration plots	33,000	2 360
6	Local tour.	20,000	1 430
7	Country tour	62,000	4 430
<b>Total</b>		<b>540,000</b>	<b>38 580</b>

B2 <i>Training costs and pedagogic tools</i>		₪	FF
1	2 manuals of 25 pages each for 32 participants.	15,000	1 070
2	Impact points sheets.	5,000	360
<b>Total</b>		<b>20,000</b>	<b>1 430</b>

B3 <i>Others ( project promotion, reports, administrative costs,..)</i>		₪	FF
1	Radio and TV coverages, press releases, newspaper articles,..	60,000	4 290
2	Reports 5 progress reports and 1 final report.	8,000	570
3	Administrative costs	35,000	2 500
<b>Total</b>		<b>123,000</b>	<b>8790</b>

C Project partners counterparts

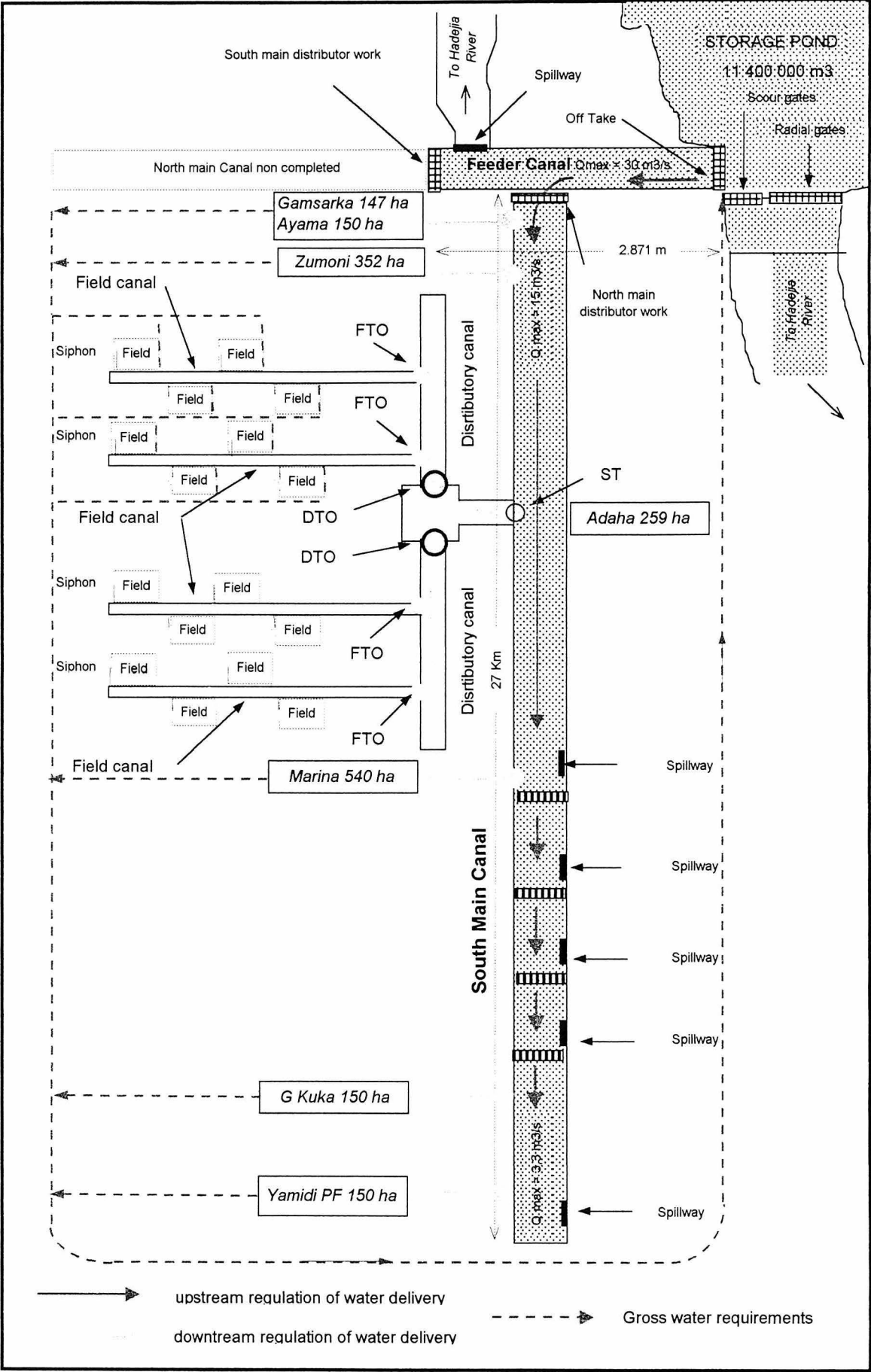
C1 <i>HJRBDA counterpart</i>		₦	FF
1	Hosting of two PRAT Meeting.	50,000	3 570
2	Logistic and other supports for staff of farmers training (8).	30,000	2 140
3	Conduct and coverage of 4 field days.	40,000	2 860
4	Provision of 7 Nos motorbikes.	560,000	40 000
5	Travelling expenses for HJRBDA coordinating staff.	250,000	17 860
<b>Total</b>		<b>930,000</b>	<b>66 430</b>

C2 <i>NAERLS counterpart</i>		₦	FF
1	Balance of OSA for trainers for 120 days at 2,000 Nairas/day .	240,000	17 140
2	Full OSA for additional 30 man days at 4,000 Nairas/day.	120,000	8 570
3	Training material.	20,000	1 430
4	Contribution to car maintenance for 18 trips at 3,000 Nairas/trip.	54,000	3 860
<b>Total</b>		<b>434,000</b>	<b>31 000</b>

C3 <i>CIRAD counterpart</i>		FF
1	Monitoring of HVP project manager mission in France and Senegal.	25 000
2	Reports and translation.	25 000
<b>Total</b>		<b>50 000</b>

**Global operation budget 1998.**

Budget implemented by	Amount (FF)	source of funding
CIRAD	304 000	MAE / Ambassade de France
	50 000	CIRAD counterpart
NAERLS	47 370	MAE / Ambassade de France
	31 000	NAERLS counterpart
HJRBDA	66 430	HJRBDA counterpart
<b>Total</b>	<b>351 370</b> <b>147 430</b>	MAE / Ambassade de France counterpart
<b>TOTAL</b>	<b>498 800</b>	



## COOPERATION CIRAD-BEC-HJDRBA

### Working plan for 1998

PROBLEMS		SOLUTIONS - TOOLS	IMPLEMENTATION PACKAGE	NAERLS TRAINING PROGRAM	CIRAD-HVP ACTIONS
1	<b>SYSTEM OPERATION AND MAINTENANCE.</b>				
	System operation (Dam - DC).	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">Item 1</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">Item 2</div> <div style="border-left: 1px solid black; padding-left: 5px; writing-mode: vertical-rl; transform: rotate(180deg);">GEOGRAPHIC INFORMATION SYSTEM MONITORING AND ASSESSMENT.</div> </div>	Mode of functioning of the main canal.  Water requirement assessment	Water head control.  Organisation for collect of information.	-
	Water allocation.(DC-Plots)	Determination and measurements	Technical Guide line	Item 9	Hydraulic measurements on main and DC canals Water requirements assesment at the level of the plots and sectors. Network operation model Training of HVP manager
	Maintenance (Farmer level).	Check of the conditions and of the functionality of the infrastructures	Implementation of works	Item 6	
	Maintenance (DC-Plots)	Prioritization of work and evaluation of cost.	Evaluation of their quality		
2	<b>AGRICULTURAL PRODUCTION.</b>				
	Techniques of production. (Type of soil, land preparation, seeds, pest control,fertilizer etc.)	Improvement of crop production technonogies.	Technical Guide lines	Items	
		Introduction of new crops		3	
		Advising farmers on right tecnics to solve problems.		4	
	Inputs situation (type/quantity, period).	Timely provision of inputs to farm.	Connection-information between users and suppliers	10	
	Credit facilities	Inform the farmers of process of lawn acquisition and sources.	Open the producers to the market conditions	12	
	Processing and marketing of produces.	Inform farmers of the marketing possibilities for their produces.			
		Encouragement to produce quality			
3	<b>WATER USERS ASSOCIATION.</b>				
	Expertise, capabilities of officials for: - administration - technics - monitoring	Special training for the officials on management administration accountancy.	Training legal advisory	Items 7 , 8 11 , 13	Digitalization of the scheme (plot, irrigation and drainage networks). Completion of the data bases (agric technics, land tenure, irrigation and maintenance)  Training session on SIG operation. Exchange of experience with others countries from the PSI CORAF already using the system.  Validity of the proposed management on the Hadejia Valley Project.  Participation of the PSI CORAF and CIRAD to the country tour of the HJRDBA and WUA official in Niger