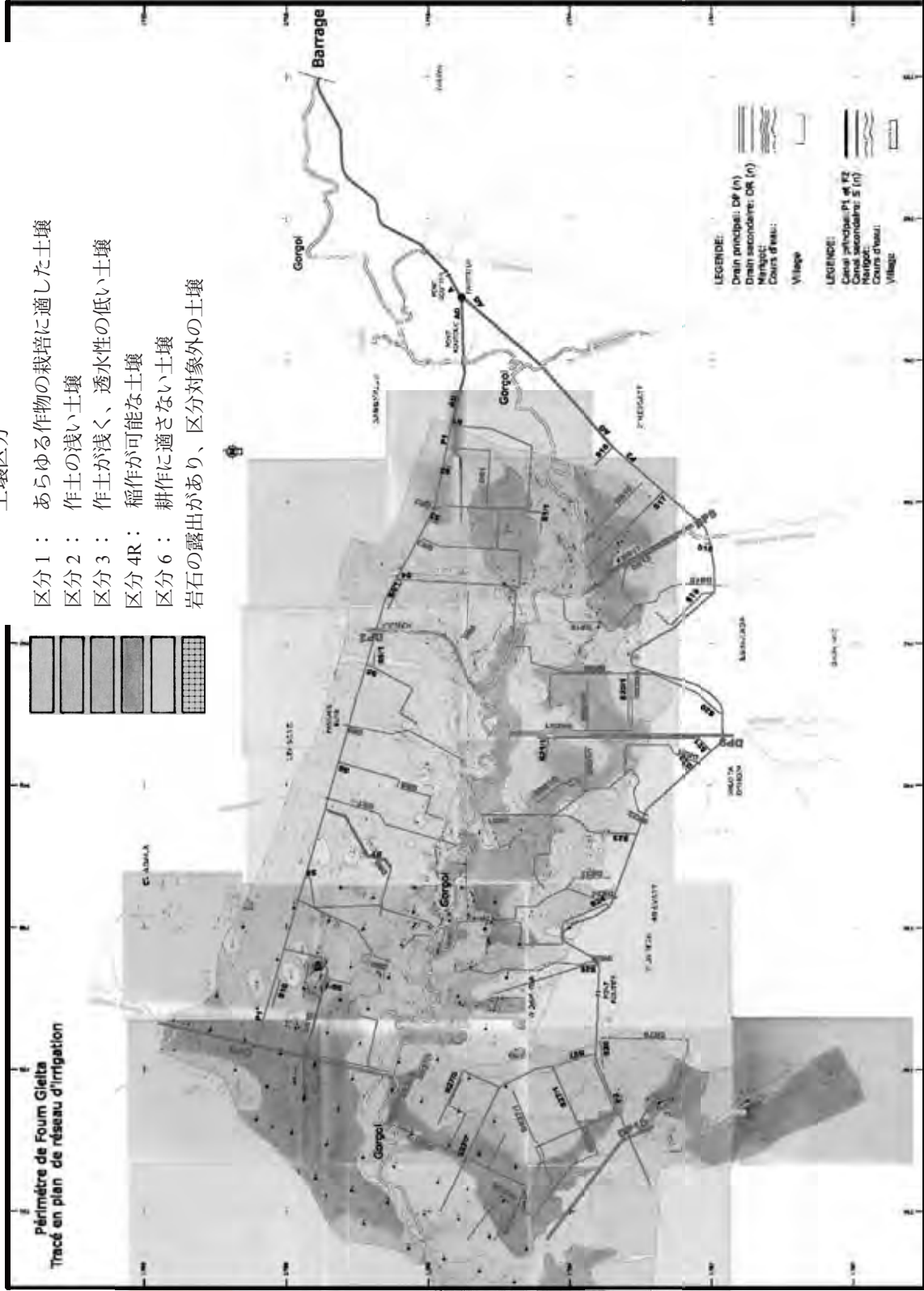


土壤区分

- 区分 1 : あらゆる作物の栽培に適した土壌
- 区分 2 : 作土の浅い土壌
- 区分 3 : 作土が浅く、透水性の低い土壌
- 区分 4R : 稲作が可能な土壌
- 区分 6 : 耕作に適さない土壌

岩石の露出があり、区分対象外の土壌



(出典: Aménagement Hydro-Agricole du Gorgol Noir, Etude Agro-Pédologique, 1977)

ANNEX 8 調査対象地区土壤図

ANNEX 9 SONADER 予算配分

Budget of SONADER

Unit: Million UM

Resource		2007			2008 (Plan)		
Project	Source	Investment	Current	Total	Investment	Current	Total
Various	RIM ^{*1} -CP ^{*2}	65	421	486	-	-	0
Various	RIM-CP Projects	922	110	1,032	-	-	0
Various	RIM				50	408	458
Various	Revenue	64	1	65	74	130	204
Various	Revenue from CGEMAT				-	63	63
Various	IDB ^{*3}	1,597	21	1,618	3,241	26	3,267
Various	IFAD ^{*4}	1,748	77	1,825	1,385	72	1,457
Various	AFD ^{*5}	196	48	244	111	1	111
Various	NTF ^{*6}	390	-	390	701	-	701
PDIAIM	World Bank	748	48	796	835	43	877
	RIM-CP				105	6	111
PAHABO ^{*7}	AfDB, IDB	16	6	21	17.4	-	17
	RIM-CP				316	1	317
PGIRE ^{*8}	World Bank	434	-	434	2,405	-	2,405
	OMVS				4	1	5
PRPB ^{*9}	RIM-CP				76	21	97
PRM	RIM-CP				76	22	98
PACDM ^{*10} II	RIM-CP				158	5	163
Various	Beneficiaries	13	-	13	26	-	26
Total		6,194	732	6,926	9,579	799	10,378
RIM : Donor		1,596 : 5,330 = 0.30			1,536 : 8,842 = 0.17		

Note ; *1 Islamic Republic of Mauritania

*2 Counterpart

*3 Islamic Development Bank

*4 International Fund for Agricultural Development

*5 Arabic Fund for Development

*6 Nigeria Trust Fund

*7 West Brakna Irrigation Scheme Project

*8 Integrated Water Resources Management Program

*9 Rehabilitation of Small and Medium Irrigation Scheme in Brakna

*10 Maghama Improved Flood Recession Farming Project

Source: SONADER

ANNEX 10 SURVEY RESULTS: WHY THE FARMERS LEFT FARMING IN FG?

A10.1 Introduction

The dam across the Gorgol River, constructed with funding from a variety of donors in 1984, created a large artificial lake with a normal retention capacity of about 500 MCM of water. This enables gravity irrigation of the land at the downstream side. The distribution of plots of 0.5 ha and construction of some infrastructures for the farmers was a kind of compensation for the damages caused by the construction of the dam, which has flooded some villages and rain-fed farming areas. By 1989, the infrastructure was in place to irrigate 1,950 ha of land for rice cropping. Initially, the yields were reasonable (4.6–5.2 t/ha), but then declined to 2.7–4.6 t/ha in 1992–1996. By 1993, some 237 ha was already been abandoned by farmers. This survey focused on the main reasons why the farmers have abandoned the farms; and in case there is any rehabilitation of the perimeters, if they are ready to come back.

A10.2 Questionnaire Survey

A questionnaire survey was conducted in three phases: the identification of key persons to be interviewed, the constitution of areas to be surveyed and the interview of the identified farmers.

(1) Identifying of Key Persons

This phase has consisted on identifying the persons to be interviewed. Mainly two essential information was considered: the names of the farmers who left, and their actual villages. To these two main information, the name of the cooperatives they belong to and the number of their vannettes (area) were added. The above information was collected through discussion with the presidents of cooperatives, notabilities and extension workers. Through these discussion, the database including the name of the farmer, his actual village, the number of his vannette and the name of his cooperative was established. Interviews with extension workers and especially the presidents of cooperatives were very helpful, since they know very well of the farmers present conditions.

(2) Areas to be Surveyed

Based on the information from the farmers and extension workers, the areas to be surveyed were divided into three according to the same geographical area. The idea was to make it easier for the trip survey and at the same time to save my time. The three areas are the villages located in the Southern area (P2), those located in the Northern area (P1) and those located in N'Bout area. Unfortunately, the Northern area could not be surveyed, because of flood, and all the accesses were locked. However, during the survey in M'Bout, it was fortunate to meet some farmers who were supposed to be met in the Northern area. However, only a few villages around the dam side were visited, and some farmers were interviewed.

(3) Interview of Key Persons

After the identification of key persons, the interviews were held with farmers of different villages. During that interviews, all the farmers identified as key persons could not be found. Some farmers were just absent or have moved to another village. It was necessary to start another identification survey on the spot to replace the missing ones.

The approach was simple, and consisted on establishing an atmosphere of confidence in order to be sure that they will give us right answers. Before starting any interview, the purpose of our survey was

explained so that the farmers understand that the purpose of the survey. Totally, 30 farmers were interviewed.

The interview took about 1 hour for one farmer according to his capacity to understand the questions or to give accurate answers. Sometimes, the same question has to be asked many times and in various ways in order to allow the farmer to understand. In order to be sure that the same answers caused by group influence during the interview, individual interview was made by visiting the farmers in their living places.

A10.3 Results of the questionnaire survey

The following results were attained from the survey:

(1) Reasons why they left irrigated perimeters of Foum Gleita

Concerning the reasons why they left the rice growing project area of Foum Gleita, the processing of the data revealed three main reasons. The reasons are mentioned below by order of importance:

- Payment of fix fee
- Rice growing is no more profitable with low yields
- Lack of water

Besides those three main reasons, the farmers expressed some other reasons. Those reasons are birds attacks, invasion of Typha and Indigo fera, bad management of SONADER and UCAF and one of the farmers even mentioned about Guinea worm disease as the main reason why he left Foum Gleita. The chart below shows clearly the number and the percentage for the main reasons.

Table A10.1 Reasons for Leaving Foum Gleita Project

Reasons	Number	percentage
Payment of fixed fees	15	50%
Rice growing is not profitable	07	23.33%
Lack of water	06	20%
Because of Guinea worm disease	01	3.33%
Plot taken from him by SONADER	01	3.33%

Note: these numbers and percentages are based on a sample of 30 farmers.

(2) Going back after rehabilitation

To this question, almost all the farmers are ready to go back after rehabilitation you will find in the chart below the number and the percentage

Table A10.2 Possibility of Returning Back to Foum Gleita Project

Answers	Number	percentage
Of course	22	73.33%
Possible	07	23.33%
If main reason cleared	01	03.03%
Probably not	00	0%
Never	00	0%

Note: these numbers and percentages are based on a sample of 30 farmers.

(3) Land certificate

Land certificate is a sensitive matter to discuss. Nevertheless, the big majority of the interviewed farmers said that they still have land certificate, which was the right to cultivate. The chart below shows the number and the percentage

Table A10.3 The number and the percentage of land certificate holders

Answers	Number	Percentage
Yes	16	55.33%
No	04	13.33%
Not sure	10	33.33%

Note: these numbers and percentages are based on a sample of 30 farmers.

A10.4 Analysis of the results

(1) Reason why they left Foum Gleita

a) Fixed fee

When did they start to pay the fixed fee? Nobody was able to give to me the right answer. Some farmers said that it was just after their first rice growing campaign that was around 1985- 1986; the other said that it was just after the two rice growing campaigns of 1987-1988. These different answers are understandable as the settlement of the perimeters started from 1984 up to 1989. The fixed fee was introduced by SONADER during those different settlements.

By introducing fixed fees, SONADER was thinking about the creation of maintenance fund. Indeed, the maintenance of the infrastructures in the perimeters was a crucial issue for the sustainability of the perimeters for rice growing.

The farmers were asked to create cooperatives, and then SONADER has decided that each farmer should pay 8,350 UM for one vannette (1 plot of 0,5ha). As they were doing two campaigns, the total amount was 16,700UM. That money should be collected by the responsible of cooperatives and paid to SONADER. That fund would be used to pay maintenance work. Everything was working properly up to years 90's when the farmers started to abandon the plots because of fixed fee. If some farmers left because of fixed fee, then the motivations were not the same, and there were three categories.

- Those who left just after the introduction of fixed fee, were not real farmers (breeders, traders and even civil servants), and they just wanted to take benefit from the advantages made by SONADER and the World Bank to settle the farmers in the project area.

Those advantages were:

- SONADER was providing seeds, fertiliser and water for free during 1 or 2 years
- World Bank was providing 4bags of millet, 1 carton of bottle of milk, 10kgs of powder milk and 15l of cooking oil for each farmer (1 vannette). During the survey, it was noticed that sometimes a whole family was registered and each of the family members has a vannette which that means a big amount of food for the same family.

This category of farmers has left the perimeters in proportion as the Work Bank stopped its program and SONADER stopped its no-charge service mainly from 1986 up to 1989. And these category of farmers left Foug Gleita at this period.

- Those who left because their plots were taken by SONADER due to the fact that they did not pay the fixed fee. This category left from 1991 to 1994. The mentioned periods are very important to understand why farmers left FG farming.
 - In 1991, SONADER Director was strict regarding the payment of fixed fee. The farmer had to pay the fixed fee or his plot would be taken from him. 1991 is also the beginning of low production after five years of rice growing. The farmers were not using basic fertilizer (TSP) or the recommended amounts of top fertilizers. SONADER was insisting on the importance of using TSP but only few of us were using it. So they could not get a good production. In addition to that, some areas were stony to make a good ploughing and as a result they could not have good

production as a consequence, they could not pay the fixed fee and other expenses related to rice production.

- The year 1994 was marked by two major events: the flood and the invasion of rats. The farmers have lost all their production. Many of them were ruined, and unfortunately they could not pay the fixed fee.
- Those who left because they were forced by SONADER to pay the fixed fee for the entire members of the cooperative. SONADER stopped the water even if some farmers paid their fix fees. During the interview, the farmers explained that they could not understand why they have to suffer from the bad behaviour of those who did not pay the fixed fee. The farmers asked SONADER to close the intakes of those who did not pay the fix fee, as one of SONADER Director was doing (1991-1992). SONADER refused and as a result, the production was decreasing year after years, and the farmers could not pay the fixed fees regularly and finally they left (1997-2003). From 1997 to 2003 they suffered from another flood and the deterioration of the canals (big break in 2003). This category was composed of good farmers and they were not happy with SONADER and UCAF management. They were ready to pay fixed fee and they understand the importance, but they need guarantees for its proper management.

(b) No benefit from rice growing

The second reason mentioned by the farmers is that rice growing was not a good business, as they could not have good benefit. They explained that the rice growing at the beginning was good, and they had profits even though the price of the “Moud” (unit of measurement use by the farmer, and 1 “Moud” is equal to 4kg of paddy) was 25 to 60UM, they had enough yield (4t to 5t) to pay all the other expenditures (seeds, fertiliser, fixed fee) related to rice growing. Unfortunately, those expenditures were increasing every year and at the same time, the production was decreasing (see chart annexed).

Some farmers did not want to give up hoping that the situation will improve. They used their savings and even sold their livestock in order to continue rice growing. But the situation worsened and they were forced to leave:

- flood (1994-1999-2007),
- damages of the irrigation infrastructures (from 2003 up to now)

During the survey, another group of farmers was found. They were not landowners, but they were growing rice and after harvesting, they have to give nearly 60% of the production to the landowner. With the remaining 40%, they have to pay back seeds, fertiliser, fix fee and feed their family. So, it means that it was impossible for them to have some profit from rice growing even with 40% of production.

The farmers explained that some of them were ruined by the system called “Thalasse”. That system consisted on borrowing money from someone (generally traders) to start rice-growing campaign and after harvesting, the entire production needs to be sold to that person at a very low price comparing to the normal one. Sometimes, the production was very good, but because of the low price, the farmers could not have any profit.

For the farmers, the conjunction of all those constraints (the high price of inputs, the bad practices of some landowners and traders, the bad maintenance of irrigation infrastructures...) have made rice growing as not a lucrative activity.

(c) Lack of water

Farmers mentioned that the lack of water is one of the main reasons why the farmers left Foun Gleita. The lack of water does not mean there is no water but water is not coming up to their plot or even if it is reaching their plot, the amount is not sufficient enough to irrigate properly.

Here the core problem is the maintenance of the irrigation canals which after many years of bad maintenance are not able to irrigate properly to the whole perimeter.

Concerning the maintenance, the farmers said they were paying regularly fixed fee, when SONADER was taking care of it, and everything was working properly. But, when SONADER has decided to hand over to UCAF all collapsed. “We were paying the fixed fees, the canals were not maintained and SONADER was not saying anything to UCAF about its bad management” said one farmer. Some of the farmers believe that UCAF and SONADER were using their money for their personal comfort.

(2) Coming Back after Rehabilitation

All the interviewed farmers are interested to return back after rehabilitation. But, it needs to be understood that the motivations are not the same.

The farmers will return back, because they are now doing rain-fed farming, which deeply depends on rain. But, when they were cultivating within Foug Gleita perimeters, water was available at anytime. And, they could cultivate for two seasons, which is not possible in rain-fed farming. Hence, these farmers will come back after rehabilitation and they will stay.

The other group will come mainly not for cultivating rice but they have the feeling that the plots belong to them.

(3) Conclusion

When the reason for the farmers leaving Foug Gleita farming was analyzed, there was only one main key word: bad management of the project area. Who to blame? The farmers who were not able to manage properly their plot (bad knowledge of rice growing, neglect of their own irrigation canal which has led to their deterioration)? UCAF which were not prepared and properly trained to manage the cooperatives and as a result it spoiled everything. SONADER did not monitor properly on UCAF management of the cooperatives. The farmers are ready to come back but they need guarantees that UCAF and SONADER management will be improved and transparent.

Fluctuation of paddy yield in Foug Gleita

Source: Framers and Extension Workers
September 2009

The unit of measurement is 1Moud
(1Moud is equal to 4kg).

- In 1984 the yield was interesting (4.8 t/ha) because it was the beginning and everything was working properly.

- In 1994, the perimeters were flooded and invaded by rats; the production was almost lost. Some farmers had 0kg

- In 2008, UNCACEM has reactivated its loan and the farmers could have seeds, and fertilizers on time, and the production was good.



Fig.A10.1 Paddy yield in Foug Gleita

Fluctuation of paddy price in Foug Gleita

Source: Framers and Extension Workers

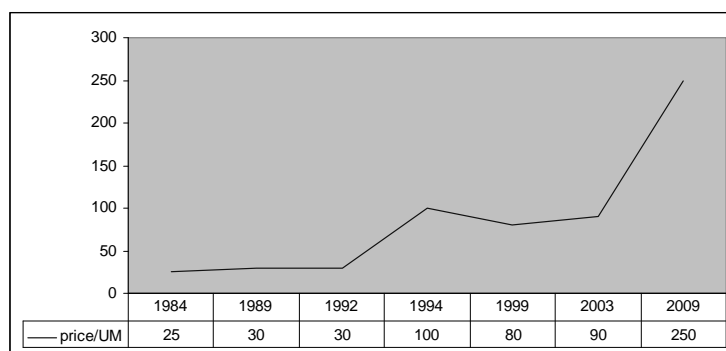


Fig.A10.2 Paddy price in Foug Gleita

In the beginning in order to encourage farmers, the Food Security Office and SONIMEX (National Company for Import and Export) were buying the production of the farmers at a very interesting price: 12.5UM/kg X4kg= 50UM/Moud instead of 30UM in the market. The farmers said they stopped suddenly; may be due to lack of budget.

Increasing Trend of the price of fertilizer

Source: Framers and Extension Workers

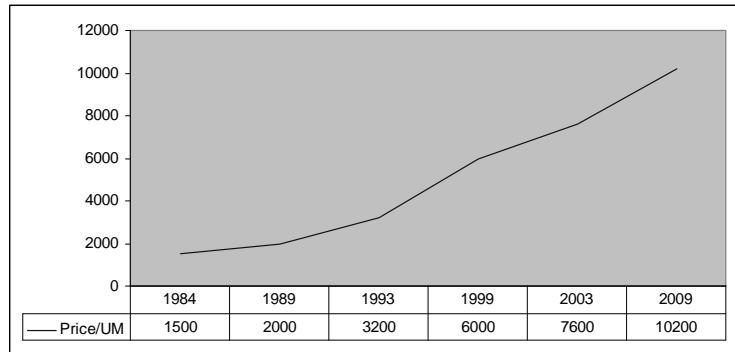


Fig.A10.3 Price of Fertilizer

Increasing of the price of labor in Foug Gleita

Source: Framers and Extension Workers
September 2009

The plot of 0.5ha is divided into 6 small plots and the prices are mainly for 1 small plot. That is to say for example: ploughing is 2,000UM, transplanting 2,000UM and weeding 2,000UM.

The price suddenly increased in 1997-1998, because of the reinsertion program of young trained agronomist in the Foug Gleita project. At that time, the state was injecting a lot of money.

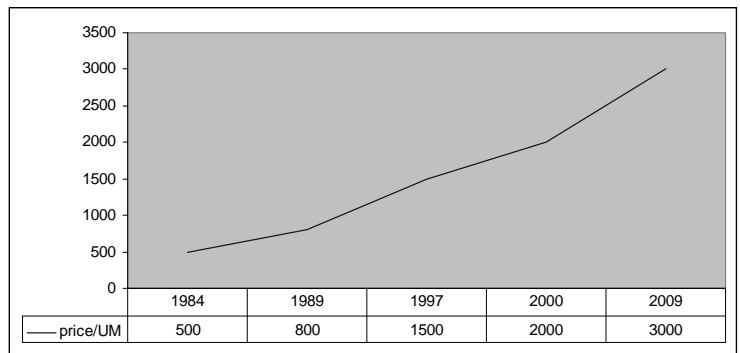


Fig.A10.4 Price of Labor

Note: The numbers used might not be accurate, they are not far from the reality, and the shape of the curves reflects the true situation of rice growing in Foug Gleita.

ANNEX 11 女性組合調査結果

1. Objective of Survey
<p>Some women have started vegetable growing in some part of the scheme, since it was established. SONADER had organized women's cooperatives, eventually, 49 cooperatives were established.</p> <p>When irrigation scheme was functioned, cooperative's field was inside (some of the cooperatives paid land fee or irrigation fee). Once irrigation facilities were not functioned, cooperatives looked for other fields which could get enough water and they have been growing vegetables.</p> <p>Rice yield in dry and rainy season has been going down due to water shortage, vegetable growing is placed as a valuable income.</p> <p>The cooperatives have a lot of problems on low yield and low income because of providing a very few support on procurement of input, growing techniques and marketing, etc.</p> <p>Then interview was conducted the following contents to grasp problems and issues.</p> <ul style="list-style-type: none"> ●Activities of Women's cooperatives in the scheme ●Seeing Relations between UNION and SONADER's activities through women's cooperatives
2. Methodology
<p>Presidents of women's cooperatives and members were selected at random in P1 and P2 site, interviewed about reason for vegetable growing, relation with SONADER and UNION, etc.(Table 1)</p>
3. Results (Selected 28women in 25cooperatives)
1) Land acquisition
<p>Most of cooperative which had own field inside of the scheme at the beginning had give up growing, then moved to outside. Accordingly, there were following problems; canals damage caused water shortage and encroaching live stocks in the field.</p> <p>On acquiring a field of outside, farmers borrowed abandoned field inside or outside field with water. In case, inside of a field, farmers paid irrigation fee or land lease charge, when canals were functioning. Being lost function, farmers stopped payment.</p> <p>Average field size of a cooperative was 3.2ha, maximum was 20ha, and minimum was 0.5ha. Not only cultivated all area, but cultivated area is changed by participants and condition of input quantity every year. (Figure 1)</p>
<p>Remarks: Farmers weren't awareness of land right and location of their fields, then they don't remember clearly past condition.</p> <p>It seems that SONADER permitted or kept quiet about land lease issue.</p>
2) Purpose of vegetable growing
<p>More than half answered about vegetable growing to get better income. Others answered about it to get into vegetable growing with trained by SONADER or activities by NGO. And they changed their original jobs (ex. rice production, daily) into vegetable growing. Some were influenced neighbors and then began growing vegetable. As a result, vegetable growing is known for an important source of income for farmers. Moreover, they realized that vegetable brings better income than rice.</p> <p>Average growing experiences have been for around 16years, maximum 25years. Vegetable growing already started, since scheme had completed.(Figure 2)</p>
<p>Remarks: Farmers didn't have any opportunity to get new knowledge and technology; consequently, their technical level hasn't been improved though they have been lots of experience.</p>
3) Farming technology
<p>Vegetables are cultivated mainly in cold dry season. Many cooperatives cultivate almost same varieties of vegetables, such as Onion, Cabbage and carrot. Onion is the most popular in this area, which have well for preservation.</p>

<p>On the other hand, in rainy season, each cooperative has a different activity, some cultivate sweet potato, okra and pumpkin, etc, and the others don't cultivate anything and concentrate on cereal production. And remains take enough rest. The reason why they don't cultivate in rainy season, live stocks grazed get in their fields, flooding, and help husband to cultivate cereals.</p>	
<p>Remarks: The reasons why farmers avoid growing vegetable in rainy season are caused issues in the scheme such as to get live stocks in the field and flooding.</p> <p>Taking a rest who answered means that women's work impact is bigger than man's (Women do all housekeeping, childcare, dry season farming, and rainy season as well). It is thought that livelihood improvement and farm work improvement are necessary for women.</p> <p>Asked variety name of vegetables to farmers, they grew them without knowing their variety name.</p> <p>Technology on onion they trained at past training was adapted widely in the scheme, and most of cooperatives multiplied seed at their field.</p> <p>It seems that cultivation technology and skills are same levels in interviewed cooperatives.</p>	
<p>M'bout, Fom Gleita, Kaedi and Selibaby are main markets. Problems are low producer price due to a concentration on production. There is no profit, selling in Fom Gleita, Kaedi and Lexseiba. Buyers sometimes come and purchase production at F.G.</p>	
<p>Remarks: Farmers sell most of productions, but as self consumption, they eat a little.</p> <p>They don't have transportation to markets. And their income is reduced with delivery cost and labor fee.</p>	
<p>4) Cooperative activities</p>	
<p>More than a half cooperatives established 10years ago, and there are over 30 members each cooperative, some are more than 100 members.</p> <p>Most of answers are the followings; purposes of establishment of cooperative are to advice from SONADER or to follow other cooperatives. Others responded that they expected advantage of organizing cooperative and realized effectiveness of communal work.</p> <p>Their activities are the following; vegetable growing is main activity, if cooperatives have excess cost (running cost), they try to do activities with expenses, like dyeing, stitch work(included in craft work), grocery shop management. SONADER conducted some activities, dyeing, and stitch work at some selected villages in first settlement. But most of villages gave up dyeing activity because of lack of materials (they were not available in their villages) and money.</p>	
<p>Remarks: Currently, dyeing activity has launched in part of villages as aid program. Some stitch works and crafts are sold in Fom Greita and M'bout.</p> <p>It is necessary to establish implementation system which is able to continue these activities.</p>	
<p>Cooperatives collect membership fee (for common fund) from each member of 90%. Common fund is spent for input purchasing for group, running cost of grocery shop management and personal loan. There are different systems about loan, one is to prohibit personal input loan, the other is to restart personal loan with reducing income.</p> <p>Concerning payback period and method, many of cooperatives consider personal matters, but when no payback without any reasons, penalty (withdraw a cooperative) set up in each cooperative.</p>	<p>Collection form:</p> <ol style="list-style-type: none"> 1. at participation 2. at cropping season only 3. at regularly 4. at participation and cropping season 5. at participation and regularly 6. at cropping season and regularly
<p>Input (Seed, fertilizer, fencing) is purchased as follows procedures.</p> <ul style="list-style-type: none"> • Person in charge will purchase; prepare money by each, then cooperative arrange them. • Person in charge will purchase; using loan by each, then cooperative arrange them. • Person in charge will purchase; prepare money from common fund. <p>Person in charge go and buy to Kaedi, then she needs some expenses like travel cost, etc other than input.</p> <p>Most of the cooperatives answered that input is expensive and they don't have enough cost of input. Some of them answered they can't get input adequate time, being no stocks in a shop</p>	

occasionally.
Loan system of SONADER: Farmers didn't notice loan for vegetable growing, but some of them knew it. It wasn't clear whether cooperatives (women) got some benefit through loan or not. Women's cooperatives originally received only few input support compared with men's.
5) Relation between cooperatives and SONADER
<p>It seemed that SONADER promised basic infrastructures, like building clinic and school, housing (and field), drinking water, and for production activities like farm field, input support. But mainly activities were the following; provided lands, foods, agricultural training for some selected farmers, livelihood improving training for women. Only the part of village might be conducted high priority project, establishment of clinic and school and drinking water facility.</p> <p>Decreasing capacity of SONADER and facilities, SONADER lost farmer's trust and interest. Some farmers answered positively AVB gave them advices and sold them some seeds and visit regularly.</p>
Remarks: It seemed that SONADER implemented easier and lower cost programs such as training, food distribution.
<p>Farmer's obligation to SONADER (or Irrigation facility) is realized by farmers as payment of irrigation fee. Irrigation fee was paid on inside of fields (rice and partly vegetable fields), before broken canals. There are some gaps among interviewed farmers; farmers stopped payment around in 2000 with damaged canals heavily.</p> <p>Concerning the question we asked farmers if canals will be rehabilitated in the future, they are going to pay irrigation fee with some conditions, for example being rehabilitated and being improved yield, etc.</p>
Remarks: Farmers recognized that payment of irrigation fee meant inside of rice field only. For vegetable field, cooperatives which didn't pay irrigation fee were more than did.
6) Relation between UNION and cooperatives
<p>2Unions have established for women's cooperatives same as men's so far.</p> <p>Out of one cooperative which doesn't participate in and 2 others (unknown for their condition) are participated in the Union.</p> <p>Farmers answered reasons for participation were on obligation of belonging to the Union, advice from SONADER, request from the Union, etc.</p> <p>Cooperatives paid membership fee at participation, but price was difference of each cooperatives.</p> <p>President of cooperatives relatively knew what roles of the Union are, they expected the Union to give them benefit (useful information, etc), loan and input providing.</p> <p>Many cooperatives answered they didn't get any benefit; however, few cooperatives received input in low price and input distribution service, though others received input and food distribution services. It means that the Union changed their handling.</p> <p>Cooperatives which answered there were no advantages to them had complaining to the Union and concerned cooperatives receiving some benefits.</p> <p>Union's activities are included in the followings; Income generation activity for the Union such as cereals (rice and millet) sales and instructive activities like consultation to cooperatives.</p>
Remarks: Many of inputs provide before are aid supply assisted directly by NGO and International organization.
Most cooperative feels that the Union isn't functioning well and not return any benefit to them. Accordingly, it is necessary to strengthen the Union's capacity building same as men's (rice).
7) Technology extension
<p>Most of the trainings which were provided at completion of the scheme are divided two types, one is contents of agricultural technology, and the other is out of farming income activities.</p> <p>AVBs are providing some training and advices irregularly on agricultural practices, but training of dyeing and stitch work is not conducted these days.</p> <p>Dyeing activity is much requested from women, it took cost for materials, and most cooperative couldn't continue this after training.</p> <p>Elder women had training experiences more than youth relatively. Young women have very few</p>

opportunity of training participation. Some answered that it is necessary to give a chance to have some training for young women.(Figure 3,4)

Remarks: Criteria of selecting were unclear about cooperatives which were conducted training. It is thought that reasons of selection were relative cooperatives, accessibility, well organized cooperatives, etc.

It is difficult to adapt technology and knowledge to farmers without regular training and follow up systems. It is thought that costly activities need not technical matters but management skills.

Concerning agricultural technology, agro processing is more high priority for farmers. It is expected that not only selling fresh vegetables but also increasing income and creating job opportunity with agro processing.

8) Problems

Farmers concerned seriously the following 4 problems; lack of input, pest and disease control, lack of fence, marketing.

Lack of input (specially purchasing money) is a serious problems included in putting fence facing many cooperatives. Secondly, it is necessary to treat pest and disease control.

Marketing needs to improve price decreasing due to concentrated on sales period and high transportation cost.

Remarks: Lack of input purchasing cost is constrained to get fence materials, pesticide and herbicide. Then expanded disease and live stocks damages cause a factor of low yield.

5. Activity on Women's cooperative in M'bout and Moybrak areas (Results)

1) Cooperatives:

As a reason of establishment of cooperative, farmers gave positive answered about it, such as creating work opportunity for women, working at self-standing, and effectiveness of communal work.

International organization and NGO (Red cross and PAM, etc) supported cooperatives to provide useful materials, fence and well at first of establishment.

Their activities are mainly vegetable growing, grocery shop, stitch work (leather craft), and dyeing and incense making as well.

2) Union:

Farmers expect the Union to arrange input, acquisition of land and instruct to cooperatives. In fact, the Union gives cooperatives only information and not to return any profit to them.

3) Training:

As for training, making fence, agro processing, sanitation program were conducted. At the same time, farmers requested wide needs, agro-processing, fruits growing, stitch work and dyeing, medical care and barber skills.

They suggested on needs for holding a regular training and a follow up training with their past experiences.

Table 1 Questionnaire

Date:	Time:		
Village:	Interviewee:	Age:	Family size:
1. Basic Information			
1) Where is your original place? 2) How long have you lived here? (When settled) 3) Which Cooperative do you belong to? 4) How much field does your family have? Are Ha 5) How about your field. Location of your and cooperative's field (inside of perimeter or not) ●Family field ●Cooperative field 6) How did you get your land? / When did you get your own land? ●Family field ●Cooperative field 7) Why do you grow vegetables? How long have you grown vegetables? 8) What crops do you grow? (crops : Maize, Sorghum, rice, vegetables, etc) ●Family field ●Cooperative field 9) How many times do you grow crops? 10) Where do you sell your productions? ●Family field ●Cooperative field			
2. Cooperative you belong to			
1) When did you establish this cooperative? (Only President) How many members? 2) Why did you establish it? (President) / Why did you participate in it? (Member) (Purpose of the establishment) 3) What kind of activities does your cooperative do? (ex. Repair and clean the canals, land preparation, etc.) 4) Are you satisfied with your cooperative? / Do you have any problems in the Cooperative?			
3. SONADER			
1) What supports SONADER did promise you, when you settled here? (ex. Ownership of land, Input, infrastructures likes school, clinic, well,) 2) What activities SONADER conducted before broken perimeters? (Collection irrigation fee, canal maintenance, input management, training, etc) 3) What activities SONADER do conduct currently? (Collection irrigation fee, canal maintenance, input management, training, etc) 4) What is your obligation for SONADER? 5) Do you pay irrigation fee? / When did you stop paying it? Why did you stop it?			
4. UNION (for Women's)			
1) UNION (your cooperative belongs) is private or under government? 2) Why does your cooperative participate in UNION? 3) What is the role of UNION ? 4) What is the obligation/duty of UNION? (pay irrigation fee, get input, etc)			
5. Procurement of Input (Agricultural materials: seeds, fertilizer, etc)			
1) How do you get input? (Through UNION, get it by her, get it by cooperative) 2) In case, you can not return money, who (which organization) support you?			
6. Other questions			
1) About needs and experiences of training 2) Do you have any problem and constrain ? (Farmer, breeder, etc) 3) About your life style (about housework, what do you eat?, etc) 4) Other comments			

Table 2 In interviewed cooperatives List

	Site	Existing Field	Cooperative	Members	Village	Ethnic
1	P1	Unknown	Tahar Agweida	80	Agweida	M: 1
2		S4 out	El Wihda	39	Sabhalla	P: 1
3		S2 out	Dar salam1	70	Sabhalla	M: 3
4		Unknown	Lebhga	34	Lehseye	M: 1
5		S5 in	Medeikhlou 1	40	Bagdada	P: 1 M: 2
6		S5 in	Medeikhlou 2	×	Bagdada	
7		S5 in	Medeikhlou 3	×	Bagdada	
8		Unknown(S7or S8)	Lehseye	50	Bagdada	
9		S7	Yakare	×	Bagdada	
10		S8 (Same as other 3)	Dentadal yalalem	31	Adala	P: 1 M: 2
11		S8	El hame	72	Adala	
12		S9? (S8)	Bentalre	62	Adala	
13		S8	Ghouwa	30	Adala	
14	P2	(S16 or 17 out)	Teissir	55	Zreighat hassen	
15		?	Nour	75	Zreighat wekech	P: 1
16		S19 out	Wihde Bedr	40	Foum Gleita	P: 1 M: 2
17		S25 or 26	Weltare	125	Bachat center	P: 1 M: 2
18		No field	Weltare Boki	145	Bachat center	
19		S25	Elhamarsidi	30	Bachat center	
20		S26 ?	El-Vedl	45	Bachat center	
21		S25	El wai 1	45	Bachat sud	
22		S26 out ?	Aridondi	71	Bachat sud	P: 5 M: 1
23		S26 out ?	Yajende	60	Bachat sud	
24		S26 out ?	Potal	57	Bachat sud	
25	Other		El-Amelelyedewe	35	M'bout	
26			SAADA	80	M'bout	
27			Adala	89	M'bout	
28		Personal field	Gonga (own field in S9,8)	50	Moybrak	P: 1

Table 3 Basic Information

Birth place	M'bout	Lesseye	Agweida	Bagdada	Berkeleul	Sabahalla	Bogue	Wekech	Zreigato	Moybrak	Total
P1	6	1	1	2	1	1	1				13
P2	12					1		1	1		15
Others	3									1	4

Age	20's	30's	40's	50's	60's	Unknown	Total
P1	1	4	4	1	3		13
P2	0	2	6	3	3	1	15
Others	0	1	1	0	2		4

Reason for settlement	Befor Dam construction	Settlement program by SONADER	Settlement for doing agriculture	Marriage	Brank	Living in M'bout	Moved from F.G.	Living in Moybrak	Total
P1	5	4	1	1	2				13
P2	0	6	0	2	7				15
Others						2	1	1	4

Residence year	10~20years	21~40years	More than 41 years	Unknown	Brank	Less than 10 years	More than 11 years	Total
P1	3	5	3		2			13
P2	0	13	0	1	1			15
Others						1	3	4

Table 4 Activity on Women's cooperative in Foum Gleita Irrigation schem (Results)

Question No	Question & Answer	No.of Answers	Remarks
1-4	Field size of family	Blank	Abandoned field
		Used to have own field	
		Nothing	
		No idea	
		0.25ha	
		0.5ha	
		1ha	
1-4	Location of Family field	Blank	S10, S9 S1, S2, S7, S9, S16, S25
		Abandonment field(Inside)	
		Inside	
		Inside (Location is unknown)	

1-2	Advice/support from SONADER or	Blank	12	
		Advice from SONADER	5	Only training and advice : No fund support
		Support from NGOs	4	NGO in Kaedi, funding, training
		Support from Other cooperatives	2	Woman's cooperative in Kaedi (fencing), Advice from Mauritania woman's
		Others	1	Advice from friends
1-3	Activity	Vegetable growing	28	
		Grocery shop	5	Meat sales, etc
		Stitch work	9	Craft (matt, pillow)
		Dyeing	5	Do activities in village Center
2-3	Activity on Vegetable growing (Check all that apply)	Blank	3	
		Holding a meeting before campaigning	23	Discussion of starting date, varieties of vegetables, quantity of input, input buyer,
		Putting fence	7	Fence preparation, materials purchase
		Cleaning canals	3	Only inside of a field and around a field
2-3	Membership fee	Hire a labor	5	300UM/person, 4,000UM, 6,500UM (depend on works)
		Blank	1	
		Payment only at participation	11	50UM, 500UM, 1,000UM
		Payment at participation and	4	
		Payment at campaigning at beginning or end	14	150UM, 300UM, 400UM, 600UM, 1,000UM, 1500UM
		Payment at regularly	10	20UM, 50UM, 100UM, 200UM, 500UM/3months,
		Before and after campaigning and	5	
At participation and regularly	2			
2-3	With/ Without Common fund	Stopped regular collection	2	Stopped regular collection, sales was decreased
		Blank	8	
		With	19	
2-3	Management of Common fund	Without	1	
		Running cost for Grocery shop	4	
2-3	Loan system on Common fund	Procurement cost of input	4	
		Blank	10	
2-3	(payback)	Loan acceptable	14	
		Emergency case only	2	
		impossible	2	
		Payback from own sales	5	To raise amount of money by own, Payback money within 3months
		Release a debt if there are obvious reason like sickness	1	
5-1	Place to purchase	Blank	20	
		F.G.	2	
		Kaedi	6	
		Nouakchott	2	
		Seed production (Onion)	1	Produced seed by themselves (onion, okra, etc)
5-1	Loan system by SONADER /UNION	Blank	23	
		By UNION	1	Provided input, fertilizer, etc irregularly
		Loan (Seed, Fertilizer)	2	Collected loan by president of cooperative, then return it to SONADER
		Sold fertilizer	1	Collected loan by AVB, managed by SONADER
5-1	In charge of input buying	No loan activities	2	Lona, 6kg of seed, 7-10bags of fertilizer : SONADER made a decision of program
		Blank	12	Don't know
		Purchase by own	11	
		Purchase by cooperatives	5	Included in only cooperative's input
5-1	Problem on input procurement	Blank	22	
		Lack of fund causes of delaying to buy	5	
		No stock in Kaedi	1	
2-3	Bylaw (cooperative)	Payback about loan	4	Without reasons, to have to leave cooperative. Stop water to the field.
		Absence of activities	9	100UM, 200UM, 400UM, 500UM, 1200UM
2-3	Contribution of members	Blank	14	
		No problem	10	Good cooperation with mixed ethnic.
		To be broken regulation	2	Problems have been improved to participate in trial plot.
		Member's incentive	1	Few participants at the trial plot
		Shared work (Quantity of work)	1	To solved problems with discussion
2-4	Problems facing cooperatives on	Member's incentive	1	Some members join in cooperative's activities, but don't join in trial plot.
3-1	Condition, pledges at the settlement (Check all that apply)	Blank	1	
		Irrigation water	5	
		Input	7	
		Siphon (pipe)	1	
		Fence making	1	
		Tractor / Storage	6	
		Livestock for plough	1	
		Allocation of AVB	1	
		Training	1	
		Land distribution	8	
		Drinking water	7	
		Clinic / Hospital	12	
		School	13	
		Means of transportation	2	
		Electricity	1	
		Housing materials / tent	4	
		Don't know	1	
3-2	Performance of SONADER before broken canals (Check all that apply)	Blank	1	
		Irrigation water distribution	4	
		Training (vegetables)	5	
		Training (land preparation)	1	
		Training (Bird scaring)	1	
		Siphon (pipe) distribution	2	
		Seed distribution	1	
		Input loan	2	
		Maintenance of canals	1	
		Land distribution	8	Ivanet, Depend on the family size
		Food distribution	6	Distributed food aid from NGO after broken canals. Millet and oil for 2years, or 1 year, period was unclear.
		School	1	
		Clinic (by NGO)	2	
		Drinking water (by NGO)	2	Established by NGO, Water supply track
Training (soup, stitch work, etc)	5			
Nothing	6			
3-3	Performance on SONADER of current years	Blank	8	
		Irrigation water distribution	1	
3-3	Performance on AVB	Nothing	19	
		Blank	14	
		Instruction, advice at fields	11	Sometimes, Regularly (each campaigning) . Conducted trainign, Seeds sales
		Never visited	3	

1-2	Advice/support from SONADER or	Blank	12	
		Advice from SONADER	5	Only training and advice : No fund support
		Support from NGOs	4	NGO in Kaedi, funding, training
		Support from Other cooperatives	2	Woman's cooperative in Kaedi (fencing), Advice from Mauritania woman's
		Others	1	Advice from friends
1-3	Activity	Vegetable growing	28	
		Grocery shop	5	Meat sales, etc
		Stitch work	9	Craft (matt, pillow)
		Dyeing	5	Do activities in village Center
2-3	Activity on Vegetable growing (Check all that apply)	Blank	3	
		Holding a meeting before campaigning	23	Discussion of starting date, varieties of vegetables, quantity of input, input buyer,
		Putting fence	7	Fence preparation, materials purchase
		Cleaning canals	3	Only inside of a field and around a field
		Hire a labor	5	300UM/person, 4,000UM, 6,500UM (depend on works)
2-3	Membership fee	Blank	1	
		Payment only at participation	11	50UM, 500UM, 1,000UM
		Payment at participation and	4	
		Payment at campaigning at beginning or end	14	150UM, 300UM, 400UM, 600UM, 1,000UM, 1500UM
		Payment at regularly	10	20UM, 50UM, 100UM, 200UM, 500UM/3months,
		Before and after campaigning and	5	
		At participation and regularly	2	
		Stopped regular collection	2	Stopped regular collection, sales was decreased
2-3	With of Without Common fund	Blank	8	
		With	19	
		Without	1	
2-3	Management of Common fund	Running cost for Grocery shop	4	
		Procurement cost of input	4	
2-3	Loan system on Common fund	Blank	10	
		Loan acceptable	14	
		Emergency case only	2	
		impossible	2	
	(payback)	Payback from own sales	5	To raise amount of money by own, Payback money within 3months
		Release a debt if there are obvious reason like sickness	1	
5-1	Place to purchase	Blank	20	
		F.G.	2	
		Kaedi	6	
		Nouakchott	2	
		Seed production (Onion)	1	Produced seed by themselves (onion, okra, etc)
5-1	Loan system by SONADER /UNION	Blank	23	
		By UNION	1	Provided input, fertilizer, etc irregularly
		Loan (Seed, Fertilizer)	2	Collected loan by president of cooperative, then return it to SONADER
		Sold fertilizer	1	Collected loan by AVB, managed by SONADER
		No loan activities	2	Lona, 6kg of seed, 7-10bags of fertilizer : SONADER made a decision of program
			1	Don't know
5-1	In charge of input buying	Blank	12	
		Purchase by own	11	
		Purchase by cooperatives	5	Included in only cooperative's input
5-1	Problem on input procurement	Blank	22	
		Lack of fund causes of delaying to buy	5	
		No stock in Kaedi	1	
2-3	Bylaw (cooperative)	Payback about loan	4	Without reasons, to have to leave cooperative. Stop water to the field.
		Absence of activities	9	100UM, 200UM, 400UM, 500UM, 1200UM
2-3	Contribution of members	Blank	14	
		No problem	10	Good cooperation with mixed ethnic.
		To be broken regulation	2	Problems have been improved to participate in trial plot.
		Member's incentive	1	Few participants at the trial plot
		Shared work (Quantity of work)	1	To solved problems with discussion
2-4	Problems facing cooperatives on	Member's incentive	1	Some members join in cooperative's activities, but don't join in trial plot.
3-1	Condition, pledges at the settlement (Check all that apply)	Blank	1	
		Irrigation water	5	
		Input	7	
		Siphon (pipe)	1	
		Fence making	1	
		Tractor / Storage	6	
		Livestock for plough	1	
		Allocation of AVB	1	
		Training	1	
		Land distribution	8	
		Drinking water	7	
		Clinic / Hospital	12	
		School	13	
		Means of transportation	2	
		Electricity	1	
		Housing materials / tent	4	
		Don't know	1	
3-2	Performance of SONADER before broken canals (Check all that apply)	Blank	1	
		Irrigation water distribution	4	
		Training (vegetables)	5	
		Training (land preparation)	1	
		Training (Bird scaring)	1	
		Siphon (pipe) distribution	2	
		Seed distribution	1	
		Input loan	2	
		Maintenance of canals	1	
		Land distribution	8	Ivanet, Depend on the family size
		Food distribution	6	Distributed food aid from NGO after broken canals. Millet and oil for 2years, or 1 year, period was unclear.
		School	1	
		Clinic (by NGO)	2	
		Drinking water (by NGO)	2	Established by NGO, Water supply track
		Training (soup, stitch work, etc)	5	
		Nothing	6	
3-3	Performance on SONADER of current years	Blank	8	
		Irrigation water distribution	1	
		Nothing	19	
3-3	Performance on AVB	Blank	14	
		Instruction, advice at fields	11	Sometimes, Regularly (each campaigning) . Conducted trainign, Seeds sales
		Never visited	3	

3-4	Obligation to SONADER	Blank	3	
		Payment of irrigation fee	22	Payment of irrigation fee for rice only. No need to pay for vegetable.
		Nothing / Don't know	3	
3-5	Payment of Irrigation fee	Blank	3	
		Paid	24	For rice and own field (for vegetable field was 2cooperatives)
		Without payment	1	
3-5	Year of Stop-payment	Blank	4	
		After broken canals	24	Gave up payment, since canals were broken. (paid 3, 4, 5, 6, 7, 9, 10, 11 years ago), Payment period was different by concerned location and cooperatives.
3-5	Payment in the .Future	Blank	14	
		Ready to pay		Need rehabilitaton, improvement of yield, inside of schem only , water will be available, etc :with some conditions
4-1	Name of belonged UNION	UNION F.G.	16	First established UNION
		Fatmousa	9	Established in 2003. Number of cooperative 27, Membership fee 5,000UM , Micro credit (borrowing:10,000UM payback:14,000UM) Grocery shop management. Sales of Sorghum and Rice are good profit.)
		Don't know	2	
		No participation	1	We don't have any benefit currently, then we left UNION.
4-2	Reason of the participation	Blank	5	
		Obligation of membership	14	Obligation of membership , all cooperatives must participat in, recommendation
		Advantage of UNION	1	
		Advice, Training	4	Other cooperative, advice and training from SONADER, Government
		Know each other	2	
		Member's decision	3	Well organized members, necessity of participation, commitment on UNION
4-2	Membership fee	Blank	9	
		UNION F.G.	11	4,000, 5,000, 6,000, 7,000UM, 1,000UM, 1,500UM
		Fatmousa	4	1,500, 1,600, 5,000UM
		Payment before	1	Price was uncertain.
		Don't know	2	We don't know how much we paid for UNION.
4-3	Role of UNION (Check all that apply)	Benefit distribution to cooperatives	13	Provided information and input from Government, Shop (Input) in F.G. , Communication with each cooperatie
		Handling loan and input.	4	Procurement of input, Loan program, Tractor lease, Set up the office
		Connection between Government and the cooperatives	1	
		Representative cooperative	1	
		Don't know	6	
		(Problems)	1	Some of cooperatives pocked benefit from UNION (unfair)
4-3	Benefit from UNION	Blank	5	
		Nothing	12	Some of cooperatives pocketed benefit from UNION, UNION is functioning, without any profit distribution. UNION keeps benefit by itself.
		Don't know	1	
		Distribution of input (current year)	6	Provided materials, fencing, foods, seed of onion and carrot
		Distribution of input (before year)	2	To sell seeds and fertilizer in low price. To provied input and fencing
		Others	3	Purchase rice in low price, changing price high, sell it., visiting and consulting problems on cooperative by UNION. Conducted some project by UNICEF.
6-1	Training experiences (Check all that apply)	Blank	11(2)	
		Nothing	2(7)	
		Agricultural technology	2	
		Land preparation	2	
		Vegetable growing	5	
		Poultry	1	Gave up activity due to many disease
		Dried vegetable	1	Gave up activity due to canal damages
		Dyeing, Stich work	8	Supported by Cooperative in Kaedi and Ministry of Women
		Soup making	1	
6-2	Training (needs) (Check all that	Blank	1	
		Vegetable preservation	16	
		Dried vegetable	10	Use excess production effectively
		Seed production	5	
		Pest disease control	9	Weeds, rabbit
		Marketing	7	Sales place , Sales method, etc
		Fence making technology	17	Making fence, How to make mesh (fence)
		Putting fence	11	
		Making mesh fence	6	How to make mesh
		Stitch work , dyeing	23	Stitch work with sewing machine, If we will do this work (stich work), we want to
		Literacy education	2	
		Grocery shop management	1	
		Food processing	1	
Balance (tools)	1	Buyers dicide selling price by themselves.		
		Growing technology	1	
6-2	Problems /Constrains	Blank	14	
		Water shortage / Damaged Canal	2	
		Shortage of field size	1	
		Pest and disease	8	Wild animals/Livestocks, pest, termite
		Lack of input	10	Seed is expensive, fencing, balance, Watering can, etc agricultural materials
		Putting fence	7	
		Vegetable preservation	2	
		Lack of training opportunity	1	
		Marketing	4	Bias of sales period / Price down, Transportation cost / means
		Drinking water	2	
6-3	Living Life	Blank	10	
		Livestock	2	
		Farming	12	Sorghum, Miaz, Rice (If water is available), Stopped growing rice,
		Jobless / Retired	3	Parrents retired, Husband is jobless
		Driver and farming	1	Temporary farmers
6-3	Your(Women's) jobs	Blank	10	
		Farming	11	Farming, Family does housekeeping mainly.
		Farming and Housekeeping	6	Farming and food preparation
		Retired	1	My daughter works in farming.
		Heaviest jobs in all housekeepings?	7	Cooking is hardest work
6-4	Others comment			Preserve onion in tent for around 5months
				One of family is working in PAM as nutrition instructor.
				Spent income to children
				Vegetable growing is better than rice.
				Spent income to family.
				Sometimes help rice planting
		Canals were destroyed by trees before.		

Table 5 Activity on Women's cooperative in M'bout and Moybrak (Results)

Questionnaire No.	Question & Answer		No. of Answers	Remarks
1-4	Field size of family	3ha	1	We had a field in S21(F.G.). When we moved to M'bout, we went there.
1-4	Location of Family field			
1-8	Variety of crop	Sorghum Matze Nyebe (beans)		
1-10	Sales place	Blank Self consumption	3 1	
1-4	Size of original Field (Cooperative)			
1-4	Location of original field	Inside of F.G.	1	Settled F.G. in 1993, but moved to M'bout in 1994
1-4	Reason of leaving of the original			Gave up growing rice (Moybrak)
1-5	Size of actual Field	Blank Less than 1ha More than 1ha~ less than 3ha Over 3ha Unclear	 1 1 1 1	
1-5	Location of actual field	Inside of F.G.	1	We have our field in S9, 8
1-6	(Actual field) means to access to the	Blank Lease land Purchased Personal Property	1 1 1 1	Purchased our field in 2002. Committed 1,200UM each member.
1-7	Reason of starting vegetable growing	Blank Needs farm land to establish a cooperative	3 1	When established a agricultural cooperative, it needed farm land and farming.
1-7	Growing experiences	Blank 1~10years Within 11~20years Over 21years	0 1 2 1	
1-9	Main crop season	Cold dry season	3	
1-8	Vegetable (Main cropping season)	Onion Cabbage Carrot Okura Tomato Eggplant Sugar beat Chill pepper		
1-9	Rainy season cropping	Nothing Do	3 1	To help family field in rainy season.
1-8	Other cropping season variety of crop (Check all that apply)	Okura Ground nut Vissap Watermelon		
1-10	Place to sell (Check all that apply)	Blank M'bout Self consumption	1 2 1	Vegetable in F.G. is better quality than ours. Sell only excess production. small-scale
1-10	Transportation cost Transportation cost per bag (UN)			
2-1	Cooperative Established year	Blank 1~10years Within 11~20years Over 21years	 2 2 2	
2-1	Number of Cooperative members	Blank Less than 30 members 31~Less than 60 Over 61	 2 2	
2-2	Reason of establishment (Check all that apply)	Blank Advice from SONADER Advantage of a cooperative To participate in trainings Ownership Other information / Advice No reason	 1 3 	Effectiveness of communal work To create working opportunity for women (wanted something to do, sold meat)
2-2	Advice/support from SONADER or	Blank Support from Government Support from NGOs Support from Other cooperatives Others	 1 3 1	Provided fencing, vegetable seed, advice from CNRADA expert Only information on supporting of NGO in Kaedi Training by UNICEF/PAM (sanitation), Support from Red cross (land, agricultural tools), Support from Food security office (well, fencing), Fo Support fencing
2-3	Activity	Vegetable growing Grocery shop Stitch work Dyeing Incense making and sales	4 3 3 1 1	Leather processing (matte), Stitch work with sewing machine
2-3	Activity on each activities (Check all that apply)	Blank Hold a meeting Participation in Farming Purchasing goods	1 3 1 1	Hold a meeting each activity group, annual meeting, Regular meeting at beginning of campaigning All members must participate in farming. Purchase goods at Nouakchott every 2-3months.
2-3	Membership fee	Blank Payment only at participation Payment at participation and Payment at campaigning at beginning or Payment at regularly Before and after campaigning and regularly At participation and regularly Stopped regular collection	 2 1	500UM at participation, 500UM irregularly / 200UM at participation, when needed, collect some. 4,000UM at participation and 200UM or 100UM monthly as fee
2-3	With or Without Common fund	Blank With Without	 4 0	

2-3	Management of Common fund	Running cost for Grocery shop	1	Sales uses as running cost of activities.
		Procurement cost of input	2	Sales ratio: 30% common fund, 70% each members, or 10% common fund, 90% each members
2-3	Loan system on Common fund			
5-1	Place to purchase	Blank	2	
		F.G.	1	
		Kaedi	1	
		Nouakchott	1	
		Seed production (Onion)		
5-1	Loan system by SONADER /UNION			
5-1	In charge of input buying	Blank	1	
		Purchase by own	0	
		Purchase by cooperatives	3	Purchase by cooperative with common fund or representative pay in advance
5-1	Problem on input procurement			
2-3	Bylaw (cooperative)	Payback about loan	0	
		Absence of activities	2	Penalty 500UM with absence 3times, if over 3times, leave a cooperative. Leave a cooperative: no refund membership fee Be forced to leave a cooperative: refund (to avoid trouble)
		Allocation board members	1	Micro-finance , President, Vice, Finance, Storage, Supervisor, etc positioning
2-4	Contribution of members	Blank	2	
		Nothing	1	
		Follow our leader	1	
2-4	Problems on facing cooperatives			
4-1	Name of belonged UNION	Blank	2	
		UNION Other UNION	1	Agro Pastoral Cooperation for the Improvement of the production
		UNION F.G.	1	(Moybrak)
4-2	Reason of the participation	Blank	4	
		Obligation of membership		
		Advantage of UNION		
		Advice, Training		
		Know each other		
		Member's decision		
4-2	Membership fee	Blank	1	
		UNION F.G.	1	5,000UM at participation and 2,000UM at meeting
		Other UNION	1	2,000UM at participation
		Payment before		
		Unknown		
4-3	Role of UNION (Check all that	Blank	1	
		Benefit distribution to cooperatives	1	Input and Land arrangement
		Instruction to Cooperatives	1	Instruction on cooperative management
		Connection between Government and cooperatives	1	
4-4	Benefit from UNION	Blank	1	
		Nothing	2	
		Provide information on supporting	1	Only information on vegetable training and well construction (but no action)
		Distribution of input (before year)		
		Others		
6-1	Training experiences (Check all that apply)	Blank	2	
		Nothing		
		Agricultural technology	1	Training on Making mesh fence by WFP
		Land preparation		
		Vegetable growing		
		Poultry		
		Dried vegetable	1	Training facilitated by Ministry of Agriculture
		Dyeing, Stitch work		
		Others	1	Training opportunity was very few, then we didn't acquire any skills.
6-1	Training (needs) (Check all that	Blank	2	
		Food processing	1	Vegetables produced in F.G. will process in M'bout, etc
		Stitch work , dyeing	1	
		Medical care	1	
		Barber skill	1	
		Fruits growing technology	1	
		Follow up after training	1	
		Regular training	1	
6-2	Problems /Constrains	Blank	3	
		Shortage of field size	1	
		Lack of fence	2	
		Low price of vegetables	1	Price is going down, flowing vegetables from F.G.
6-3	Living Life			
6-3	Your(Women's) jobs			
6-4	Others comment			Onion, cabbage, ground nut were produced last year. Flooding destroyed some facilities. Some project, school, sanitation, etc Expect to expand farming Our area withdraws water from river directly.

ANNEX 12 農家經濟調查結果

Table A12.1 Household Annual Budgets for Producing Rice among the Respondents

(UM/household/year, unless otherwise specified)

		Foum Gleita					Lexeiba	PPG1&2			
		N.	Minimum	Mean	Median	Maximum	Standard Deviation	Median	Median		
Area (annual cumulative, ha)		15	0.3	1.3	1.0	6.0	1.4	1.3	2.0		
Revenue	Production (paddy, kg)	15	320	2,225	1,648	7,840	2,041	7,667	7,268		
	Selling price (paddy, UM/kg)	13	22	47	47	63	11	83	64		
	Value of products	12	20,000	110,860	59,625	490,000	132,973	1,400,52	522,200		
	Max. production (paddy, kg)	14	800	3,291	2,720	8,640	2,429	10,667	7,968		
	Min. production (paddy, kg)	15	160	1,255	960	3,520	1,167	1,088	2,851		
	Max. price (paddy, UM/kg)	10	28	61	63	109	20	89	94		
	Min. price (paddy, UM/kg)	9	17	32	31	47	10	80	56		
Cost	Material	Seeds	Quantity (kg)	15	13	41	32	115	30	51	88
			Price (UM/kg)	15	0	129	109	600	141	0	159
			Cost	15	0	5,087	1,875	19,800	5,631	0	14,000
	Urea	Quantity (kg)	16	50	218	150	1,170	270	400	600	
		Price (UM/kg)	15	150	195	200	240	28	150	173	
		Cost	15	10,000	39,383	24,000	234,000	54,911	64,000	103,800	
	TSP	Quantity (kg)	16	0	51	17	200	70	0	17	
		Price (UM/kg)	7	100	164	160	240	45	150	125	
		Cost	15	0	6,344	0	28,000	8,888	0	0	
	Agricultural chemicals		19	0	0	0	0	0	7,667	0	
	Water		15	0	0	0	0	0	68,933	66,610	
	Storage bags		14	771	4,477	3,366	14,000	3,724	17,113	16,800	
	Total		15	13,675	55,250	49,881	255,514	59,191	163,180	212,850	
	Labor	Land preparation	14	0	12,601	7,500	54,000	14,372	48,000	25,680	
		Nursery preparation	13	500	2,176	1,250	12,000	3,051	3,500	3,250	
		Transplantation	12	3,000	24,486	13,000	123,750	34,859	28,000	22,500	
		Weeding	13	2,750	26,423	15,000	75,000	24,319	34,667	49,375	
		Bird control	10	15,000	49,333	48,750	105,000	30,827	35,000	52,500	
		Animal control	13	28,000	111,962	82,500	300,000	89,585	65,000	43,125	
Harvesting/thrashing		13	4,000	42,135	28,250	198,000	53,322	70,500	78,625		
Total		13	46,000	225,561	163,500	582,000	162,692	396,000	333,430		
Transportation	9	0	5,592	3,125	23,500	7,366	0	11,750			
Total excluding labor		13	15,829	60,675	37,511	259,886	64,585	163,180	221,850		
Total including labor		13	61,829	286,235	221,000	757,886	210,223	447,938	555,280		
Profit excluding labor		15	-214,886	53,719	20,700	405,375	136,942	387,862	259,673		
Profit including labor		15	-712,886	-200,586	-152,527	14,619	178,455	199,362	-137,065		

N.: number of respondents in Foum Gleita who provided viable answers (Maximum 19: 15 [those who were regularly cultivating rice] + 4 [those who had not cultivated rice in recent years but restarted this year]).

Source: Agricultural household survey, conducted by the JICA study team (2009)

Table A12.2 Representative Household Annual Budgets for Producing Maize, Sorghum, Cowpea, and Sweet Potato among the Respondents in Foug Gleita

(UM/household/year, unless otherwise specified)

	Maize	Sorghum	Cowpea	S. Potato	Total	Remark
Area (ha)						1
Production (kg/ha)	180	430	237	1,891		2
Price (UM/kg)	62	110	116	80		
Value of production (UM)	15,800	60,000	34,916	135,658	246,374	3
Seed						
Quantity (kg/ha)						
Price (UM/kg)	444	138	465	0		
Cost	2,000	1,113	1,100	0	4,213	4
Urea						
Cost	0	0	0	5,000	5,000	5
TSP						
Cost	0	0	0	0	0	
Agricultural chemicals						
Cost	0	0	0	0	0	
Water fee						
Cost	0	0	0	0	0	
Bag for storage and sale						
Cost	480	960	480	3,120	5,040	
Machinery rental						
Cost	0	0	0	0	0	
Transportation						
Cost	700	1,400	875	4,550	7,525	6
Production cost	3,180	3,473	2,455	12,670	21,777	
Profit	12,620	56,528	32,461	122,988	224,597	

Source: Agricultural household survey, conducted by the JICA study team (2009)

1. Many farmers in Foug Gleita cultivate sorghum in rainy season in rainfed cropland (Diéri) and cultivate maize and cowpeas in cold dry season in flood recession land (Décrue). While sweet potatoes can be cultivated throughout the year, the majority of the respondents cultivated this crop only once a year or at most twice a year. According to them, although those lands are passed on from generation to generation, cultivated area changes every year depending on the amount of rainfall and the expansion of flooded area. Therefore, it was not possible to obtain reliable information on the average annually cultivated area for these crops.
2. It should be noted that these data are averages of the quantity produced, which changes from year to year, and also that these are not measured but recalled data by the respondents.
3. Quantity times unit price does not equal value of production, because each of these values are the median for each variable among the respondents and the number of respondents who provided viable answers were different across the variables.
4. The majority of the respondents obtained sweet potato vine for free.
5. While no respondent applied fertilizer to maize, cowpeas or sorghum, the majority of the respondents cultivating sweet potatoes answered that they applied urea to the crop.
6. [Transport cost from farm to storage place] + [Transport cost from storage to Foug Gletia market].

Table A12.3 Representative Household Annual Budgets for Breeding Cattle, Sheep, and Goat among the Respondents in Fom Gleita

(UM/household/year, unless otherwise specified)

	Cattle	Sheep	Goat	Total	Remark
Number of animals bred	3	5	8		1
Number of Birth (heads/year)	1.0	3.4	5.3		
Mortality	0.1	0.1	0.1		2
Age when selling	5.0	1.3	2.4		
Price (UM/head)	72,625	9,000	7,500		
Value of production	13,073	22,309	14,921	50,302	3
Pellet Feed					
Quantity (kg/head)	75				
Price (UM/kg)	90				
Cost	8,700	0	0	8,700	4
Wheat					
Quantity (kg/head)	41				
Price (UM/kg)	100				
Cost	4,425	0	0	4,425	4
Injection					
Cost	308	258	0	566	
Tablet					
Cost	188	0	0	188	
Care					
Cost	0	0	0	0	
Transportation					
Cost	0	0	0	0	
Production Cost	6,033	1,186	3,150	10,369	4
Profit	7,040	21,123	11,771	39,934	

Source: Agricultural household survey, conducted by the JICA study team (2009)

1. As the objective of this analysis is to calculate the annual value generated by the breeding, the number of animals bred is basically irrelevant, because it represents the value of asset. However, there must be naturally a positive correlation between the number of animals bred and the number of annual birth.
2. Assumed value.
3. Estimated by the following calculation:

$$[\text{value of production}] = [\text{number of birth}] \times (1 - [\text{mortality}]) \times [\text{price}] / [\text{age when selling}]$$
4. Quantity times unit price does not equal cost, or the sum of each cost does not equal the total production cost, because each of these values are the median for each variable among the respondents and the number of respondents who provided viable answers were different across the variables.

ANNEX 13 域外灌漑地区

幹線水路からホースによるサイフォンで、受益地外部で灌漑を行っている地区を域外灌漑地区としており、今次調査では主要な域外灌漑地区の測量(図面は次ページ)および全域外耕作者についてのリストを作成した(リストは末尾)。ここではそのリストの内容について検討する。

まず、表1に示すように、域外灌漑地区は最上流の導水路周辺およびP1幹線の最上流部S1地区が人数、面積とも多数を占め、全体では132の個人・組合が155haを灌漑している。開発面積の8%、現況作付面積の約1/3にあたる。

次に生産物(表2、複数回答)については、生産者数ではコメが半数を占め、メイズ、野菜、ソルガム、サツマイモと続く。作付面積では、コメ、野菜、メイズ、ソルガム、サツマイモとなっている。コメ、野菜、メイズが重要な作物であることが分かる。コメの栽培は水の消費が多いため、地区全体の水需要への影響は大きい。

次に域外で耕作する理由を尋ねたところ(表3)、8割の農民が灌漑水の不足をあげている。灌漑水を得るため、水の入手が容易な幹線水路沿いに耕作地を設けていることになる。

最後に、これら132の個人・組合が、受益地内に耕作権を伴った圃場を持っているかどうか尋ねたところ、6割の農民が持っていると回答した(表4)。また、聞き取りではそれらの農家のほとんどは、灌漑施設がリハビリされ、彼らの農地まで灌漑水が供給されれば戻るとの意思を示した。

表A13.1 域外灌漑地区エリア

	Area	No. of people	Area (ha)
Diver-sion	OA	32	70.0
	AD	21	29.5
	Partiteur	9	10.5
P1	S1	42	21.0
	S3	10	5.0
	S5	4	2.0
P2	SF7-S16	5	8.5
	S23	4	4.3
	S25	5	4.0
Total		132	154.8

表A13.2 生産物

Products	No. of Producer	Potential area (ha)
Rice	96	77.5
Maize	30	37.5
Vegetable	27	67.5
Sorghum	10	12.8
Sweet potato	9	12.5
Millet	3	3.3
Fruit	2	18.0
Total	177	229.0

表A13.3 域外で耕作する理由

Answers	
1. Water shortage	69
2. Insufficient land	9
3. Owning the land	2
Total	80
Rate of "1." (%)	86

表A13.4 受益地内に圃場があるか

Answers	
Yes	80
No	52
Rate of Yes (%)	61

Information of Outside Cultivator

Location	Given name	First name	Village	Cooperative	Product	Area (ha)	Field inside	Reason for outside cultivation
S1	Abderahmane	Ould Mami	Aguoeda	Tahara	Rice	0.5	Yes	SI break
	Yarbe	Ould Miami	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Hasni	Ould Abdi	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Jaafar	Ould Wedara	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mriissara	Ould Mohamed El Abd	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Abdelilahi	Ould Mohamed El Abd	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Abderahmane	Ould Birama	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Laila Khmathe	Ould Birama	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Deiche	Ould Birama	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Abdelilah	Ould Abdi	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Ahmed	Ould Tewmi	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mohamed	Ould Khweya	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Ahmed Sidi	Ould Boubacar	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	El Hacem	Ould Taleb Youssef	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Wenatou	Ould Mohamed El Mokhtar	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mohamed	Ould Sidi Mahmoud	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Salem	Ould M'Berguene	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Bah	Ould M'Berguene	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Noutou	Ould Mohamed Saghier	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mohamed	Ould Samba	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mohamed	Ould Samba	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	El Hacem	Ould Samba Val	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Kerim	Ould Abderahman	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Nagi	Ould Abderahman	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Jaafar	Ould Sid'Ahmed	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Baba Nagri	Ould Sid'Elmine	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Hechem	Ould Mexilde	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Melamine	Ould Sid'Ahmed	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mohamed	Ould Mexilde	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Mohamed	Ould Mondriche	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Sidi Mohamed	Ould Boullah	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
	Alioune	Ould Mondriche	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage
Abdatt	Ould Abeide El Baraka	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Abidine	Ould Ahmed	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Sidi Mohamed	Ould Tomi	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Mohamed	Ould Khairala	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Dah	Ould Magha	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Manetoullah	Ould Magha	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Nagem	Ould Magha	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
El Hacem	Ould Sidi Mohamed	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Mohamed	Ould Ali	Aguoeda	Tahara	Rice	0.5	Yes	Water shortage	
Abdelilah	Ould Maleck	Sabhallah	El Wihda	Rice	0.5	Yes	Water shortage	
Sidi	Ould N'geyda	Sabhallah	El Baghia	Rice	0.5	Yes	Water shortage	
Bilale	Ould Sleymane	Sabhallah	El Wihda	Rice	0.5	Yes	Water shortage	
Cheikh	Ould Moryd	Sabhallah	El Wihda	Rice	0.5	Yes	Water shortage	
Mohamed	Ould Sabar	Sabhallah	Taakhi	Rice	0.5	Yes	Water shortage	
Sidi	Ould Sabar	Sabhallah	Taakhi	Rice	0.5	Yes	Water shortage	
Abdeikerime	Ould Soule	Sabhallah	Dar Selam	Rice	0.5	Yes	Water shortage	
Bouka	Ould Ali	Lehseye	El Barakatt	Rice	0.5	Yes	Water shortage	
Teyibe	Ould Ali	Lehseye	El Barakatt	Rice	0.5	Yes	Water shortage	
Tetoubatt	Ould Bambari	Lehseye	El Barakatt	Rice	0.5	Yes	Water shortage	
Dah	Ould Beybahi	Baghdada	Lesseye	Rice	0.5	Yes	Water shortage	
Sidi	Ould N'geyane	Baghdada	Lesseye	Rice	0.5	Yes	Water shortage	
El Housseynne	Ould Ghassem	Baghdada	Lesseye	Rice	0.5	Yes	Water shortage	
El Hacem	Ould Samba	Baghdada	Lesseye	Rice	0.5	Yes	Water shortage	
S3								
S5								

Information of Outside Cultivator

Location	Given name	First name	Village	Cooperative	Product	Area (ha)	Field inside	Reason for outside cultivation
O-A	Sidi	Ould El Hage	Meyjige	Charave	Fruit, vegetable	12	No	Land owner
	Moulaye ahmed	Ould Né	Rakna	Teysrir	Maize, sweet potato	2	Yes	S16/T192/2/V2 no reason
	Astel	Sow	Meyjige	aucune	vegetable, maize	0.5	No	
	Issa	Alfa	Meyjige	aucune	vegetable, maize	2	No	
	Abderahmane	Awe	Meyjige	aucune	vegetable, maize/CSC rice	2	No	
	Cooperative Meyjige 1		Meyjige	Meyjige1	vegetable	1	No	
	cooperative Chebak	Meyjige	Meyjige	Chebak Meyjige	vegetable	1	Yes	S1 break
	Hamamdi	Demba	Meyjige	aucune	vegetable, maize	1	No	
	Harouna	Hamidou	Meyjige	aucune	vegetable, maize	0.5	No	
	Dené	Mint Saleh	Meyjige	aucune	vegetable, maize	0.5	No	
	Adama Aleli	Sow	Meyjige	aucune	Rice, maize	0.5	No	
	Oumar	Djamiel	Meyjige	aucune	Rice, maize	0.5	No	
	Yéro	Bamol	Meyjige	aucune	Rice, maize	0.5	No	
	Mohamed	Ould Moundriche	Meyjige	aucune	Rice, maize	0.5	Yes	
	Amar Sidi	Ould Amar	Meyjige	aucune	Rice, maize	0.5	No	
	Niaki	Ould Amar	Meyjige	aucune	Rice, maize	0.5	No	
	El Yemari	Ould Mahmoud	Meyjige	aucune	Rice, maize	0.5	No	
	Mohamed Cheikh	Ould El Hage	Meyjige	aucune	Rice, maize	0.5	No	
	Sidi	Ould El Hage	Meyjige	Charaf	Rice, maize, fruit	6	No	
	Hassine	Mint Askeri	Zreigua	Teysrir	maize	0.5	Yes	Landlessness
	Chrif	Ould Isselmou	Zreigua	El etihad	maize vegetable	2	Yes	Owning land
	Moulaye Idrisse	Ould El Hage	Zreigua	aucune	vegetable, maize	0.5	No	
	Abdellah	Ould El Hacem	Zreigua	aucune	maize, millet	1	No	
	Cooperative teysrir femmes		Zreigua	Teysrir femmes	vegetable	3	No	
	Cooperative Nour1		Zreigua	aucune	vegetable	2	No	
	Cooperative Wihda-beder		Base vie	aucune	vegetable	6	Yes	
	Cooperative mena		Base vie	aucune	vegetable	1	No	
	Groupment non cooperative		Base vie	aucune	vegetable	8	No	
	Cooperative Aleyba		Base vie	aucune	vegetable	6	No	
	Cooprative Dhebe		Base vie	aucune	vegetable	5	No	
	Deti		Base vie	aucune	Cereal	0.5	No	
	ifra	Woulou	Base vie	aucune	Sweet potato, sorghum maize	2	No	
	Ahmed	Ould Bouchgueygue	Meyjige	aucune	Cereal sweet potato	2	No	
	Dede	Ould Ahmed Salem	Meyjige	aucune	maize sorghum sweet potato	1	No	
	Cooperative Wuhda Barrage		Ould Ali Agweda	aucune	vegetable	6	No	
	Baba Nagi	Ould Meylidi	Agweda	aucune	Rice, sorghum	1	No	
	Samba	Fati	Ould Ali Agweda	aucune	Rice sorghum	1	No	
	Adama	Amadou	Ould Ali	aucune	Rice sorghum	2	No	
	Issa	Alfa	Meyjige	aucune	Rice maize potato	4	No	
	Yahya	Ould Lekmache	Meyjige	aucune	Rice	1	No	
Tahra	Mint Taleb Vezaze	Meyjige	aucune	Rice	1	No		
Melanine	Ould Sidi Ahmed	Meyjige	Tahara	Rice maize potato	1	Yes	S1 break	
Chama	Mint Ethmane	Agweda	El Baqhia Taher	maize sorghum	1	Yes	S1 break	
Mohamed Elabde	Ould Laghdaf	Ould Ali	aucune	Rice maize potato	1	No		
Mohamed	Ould Laghdaf	Meyjige	aucune	Rice maize potato	1	No		
Hachem	Ould Maatalla	Meyjige	El Baqhia Taher	Rice maize potato	1	No		
El Hasnia	Mint Jeddou	Meyjige	El Baqhia Taher	Rice sweet potato	1	Yes	S1 break	
El Bane	Ould Elbane	Meyjige	chilouhviichi	Rice	0.5	No		
Marieme	Mint El Bane	Meyjige	chilouhviichi	Rice	0.5	No		
Samba	Ould Abderahmane	Meyjige	chilouhviichi	Rice	0.5	No		
Abdi	Ould Ahmed	Ould Ali	El Baqhia Taher	Rice	1	Yes	S1 break	
Hadiya	Ould Slama	Ould Ali	El Baqhia Taher	Rice	1	Yes	S1 break	
Ahmed Levram	Ould	Ould Ali	aucune	Rice	1	No		

Information of Outside Cultivator

Location	Given name	First name	Village	Cooperative	Product	Area (ha)	Field inside	Reason for outside cultivation
Partiteur	Ahmedou	Ould Mehdi	Rakna	El Baghla Taher	Rice maize potato	2	Yes	S1 break
	Oumar	Ould Birama	Zreigua	aucune	Rice vegetable sweet potato	1	No	
	Idoumou	Ould Nirama	Sabhallah	Tahara	Rice sweet potato	1.5	Yes	S1 break
	Touhami	Ould Mohamed	Rakna	aucune	Rice sweet potato	1	No	
	Hachem	Ould Souiedi	Rakna	aucune	Rice	0.5	No	
	Brahim	Ould Messoude	Rakna	aucune	Rice	2	No	
	Cheikh	Ould semssed	Sabhallah	El Baghla Taher	Rice	1	Yes	S1 break
	El Ghotobe	Ould Hofdo	Zreigua	Teyssir	Rice	0.5	Yes	Insufficient land
	Jaafar	Ould Khoiyrre	Zreigua	aucune	Rice	1	No	
	Moustapha	Ould Sidya	Zreigua	aucune	Rice	1	No	
SF7 -S16	Yahya	Ould Ahmed Lejed	Zreigua	Teyssir	Rice	0.5	Yes	Insufficient land
	Moulaye	Ould El Hacene	Zreigua	Teyssir	Rice	5	Yes	Insufficient land
	Sidi Mohamed	Ould Messoude	Rakna	aucune	Rice	1	No	
	Mohamed	Ould M'Byrik	Zreigua	Nour	Sweet potato sorghumu maize	1	Yes	Insufficient land
Sifon S25 P2	Cooperative NASROUNE Femme	Sid'Elhady		NASROUNE Femme	vegetable	1	Yes	S 24 break
	Cooperative MEDINA FEMME	Bachatt II		MEDINA FEMME	vegetable	0.75	Yes	lack of water on their vanette
sifon S25	Cooperative ETHADE Femme	Bachatt II		ETHADE	vegetable	0.5	Yes	lack of water on their vanette
	Cooperative NDOULE	Bachatt I		NDOULE	vegetable	1.25	No	No land in perimeter
S23 P2	Cooperative EL VADEL	Bachatt I		EL VADEL	vegetable	0.5	No	No land in perimeter
	Rabya		TOUGUE	NASROUNE	vegetable	0.5	Yes	Water shortage
S23	Sidna		TOUGUE	aucune	sorghum, millet	0.25	No	No land in perimeter
	Sidi Mokhtar	Ould Mreziague	TOUGUE	NEJAH	sorghum	1.5	Yes	Insufficient land
4.25			TOUGUE	IM'Bediatt	vegetable, millet, sorghum	2	Yes	

Total/Average

Total No. of people (groups) 132		Total area	
Products	No	Potential area (ha)	Reason
Rice	96	77.5	69 Water shortage
Maize	30	37.5	9 Insufficient land
Sweet potato	9	12.5	2 Owning the land
Vegetable	27	67.5	80 Total
Sorghum	10	12.8	86 % of water shortage
Millet	3	3.3	
Fruit	2	18.0	

ANNEX 14 フーム・グレイタダム診断の結果

A14.1 ダムのアバット基礎

1) 右岸アバット

2008年11月にダムサイトの右岸アバットを視察した。このときの貯水池はほぼ満水位状態にあり、湖水は湖面を吹奏する風によってダムの洪水吐（spillway）越流堰のクレストを越流するレベルにあった。

ダムの下流右岸の斜面を踏査したが、全く漏水している痕跡が認められなかった。また同行したSONADER技術職員からも着任以来今までに漏水箇所を見たことはなかったとの言もあった。

ダムサイトの右岸では下流河川の水面に近い標高で、調査横坑[?]が掘られていた。洪水期には下流水面が上がり（また河川の堆砂が多い時にも河川水位が高い時もあった）、この横坑に河川の水が浸入すると言うが、この調査時には侵入する水位には至っていなかった。横坑内は異臭のする黒色のタールのような液体が底面を薄く覆っていた。これは住み着いたコオモリの糞が水を汚染したためとの事であった（SONADER管理技術員の言）。ただ黒色の水面に水の動きや湧水箇所は全くなく、また横坑の行き止まりまでの岩盤には漏水の痕跡も認められなかった。この様な状態から右岸横坑でも漏水はないものと判定された。

2) 左岸アバット

2010年2月にダムサイト全般を踏査する機会があった。貯水池は満水位より1m程度低い標高にあった。右岸の場合同様、左岸アバット下流側の広範囲を見たなかでも漏水痕跡は認められなかった。（SONADER技術職員も同じ意見であった。）下流河川沿いに掘削されていた調査横坑は河川水位が低目であったため、内部を視察できた。横坑の底面は岩砕が堆積していたが、殆ど湿気はない状態であった。この横坑は河川に面する岩盤斜面からダム軸と並行方向に数m進んだ後、上流に直角に折れ曲がる線形であった。以下の写真に見られるように、突き当たりまで岩盤のどこからも漏水の痕跡は認められなかった。



河床部については河川水があり観察することはできないが、以上両アバットの視察結果からダムサイトの基礎からは水密で漏水懸念のない状態と考えられる。当ダムサイトの地質は古

生代の硬質な片岩類 (schist) であり、層理面 (bedding plane) が 60 度以上立った傾斜を有した構造である。これがダム基礎として貯水池からの浸透水に対して水密性を得やすい地質構造とみなせ、またコンクリートアーチダムとして堅硬な岩盤まで風化帯・亀裂帯を掘削した成果と判定される。

A14.2 堤体

1) ダム天端

ダム天端の通路コンクリートは各ブロック (1 ブロックから 11 ブロック) とともに全般に表層クラックの分布が見られる。方向性は特になく、特に外力が作用して発生したものとは考えらず、一般的な乾燥クラックであるようだ。



クラックの深さは、SONADER 管理技術者の弁によれば 1cm 程度以下の浅いものである。このコンクリートは本体自体の表層に打設された保護層であり、ダムの構造的な安全性にかかわるものではない。保護コンクリートの剥離に至らせないため、また外見上の見苦しさを避ける目的でウレタン系の止水材塗布でクラックを処置すればよい程度と判断される。

2) ダム本体

アクセス可能な堤体下流斜面を視察する限り、堤体のコンクリートは堅硬で水密性も全く異常はない。11 ブロックからなるダム本体の接続部に布設された止水板も正常で、各ジョイント間からの漏水も全く検出されていない。(なお高水圧の作用するダムの標高の低い位置では、下流の河川に濁った水が常時湛水しているため漏水の有無は観察できなかった。)

9 ブロックのフィレット (本体とアバット接合部の埋め戻しコンクリート) では付記の写真に示される漏水が観察される。この位置には複数の水抜き孔とグラウト注入孔がある。古くから居るダム管理技術者はこの処理に係っていないことから、恐らくダム完成の間もない時期に処理されたものであろう。しかしその漏水量は非常に僅かであり、経年して漏水量が増加する傾向はないとの情報から、現時点では問題点になるレベルのものではないと判断される。ここと同様な漏水処理が右岸のアバットの一部 (2or 3 ブロック?) あるが、現在漏水はないと聞く。もし漏水問題が将来発生する場合は、この様な処理した場所すなわちそのような素地がある位置が該当する可能性が高い。今後もこの位置の状態変化を視察・記録を継続することが提案される。



9 ブロックのフィレット漏水は、満水位状態での漏水が、貯水位が低い場合より少ない

との情報があった。貯水による水圧がアーチダムを介してアバット基盤に伝達されるが、大きな水圧ほど作用圧が高まり、高傾斜基盤の層理面間の微細な水ミチを閉じる方向に働くものと推察される。

左岸側の 9 ブロックのフィレットでは下流斜面の仕上げ面のコンクリート表面が部分的に剥離して鉄筋がむき出しになっている。ダム構造の安定性に阻害を与えることはないが、放置すれば鉄筋の腐食が進行して剥離が進展する可能性があるため、ウレタン材等で被覆処理が望ましい。

堤体斜面上流側は常時貯水があるため診断できなかった。貯水池の水質は利用されている灌漑用水の水質試験から pH は中性であり塩分も無視でき（農民が飲用に使用している）、コンクリートに有害な影響を与える性質ではない。またほぼ恒常的に貯水面以下であるコンクリートには品質を維持するのにむしろ適している。このような事柄から、上流斜面の状態は下流斜面より良好に保たれているであろう。

堤体の各ブロック内部には温度計及び応力計が埋設されている。これの計器は毎月の中旬の定期計測が継続して行われている。この計測結果の整理図を見る限り以下の傾向が読み取れ、特記すべき懸念はない。

- ① 全体的に冬場は堤内温度が低く、夏場は温度が高く計器は正常に作動しているようだ。
- ② ダム完成から 3 年程度はいずれの場所に設置された温度計はそれ以降の計測値より高めの値を示している。
- ③ 降雨量と下流でのダム用水の使用量の差によるものと推測されるが、ここ数年貯水池は以前に比べて、年と共に緩い水位上昇傾向がある。この貯水池の水位と連動して各ブロックの拘束圧は変動する。
- ④ このときアバットに密着するブロック 1 及びブロック 11 以外のブロックは、上記の貯水池の水位上昇傾向と調和している。
- ⑤ ただブロック 1 及びブロック 11 では逆に拘束圧が貯水池の水位上昇とは調和せずむしろ逆に減少傾向にある。これらのブロックはダム完成初期のコンクリート発熱により膨張しようとした堤体コンクリートが基盤で拘束を受けて、堤体に拘束圧力を有したものと推察される。その後経年してこれが徐々に解放されたことに影響されて全体応力としては僅かながら低減傾向になったと考えられる。



A14.3 ダム付帯施設

ダム診断は 1990、1994 及び 2004 年実施されている。最近の 2004 年ダム診断からは上記した今回の診断同様、ダムの仕上げまたは二次コンクリートのクラック発生はあるもの硬質でダムの構造安全性に係るレベルのものはなく、また基礎地盤は堅硬、水密性の高い岩盤に設置され特段問題なく安全に機能を保持している報告がなされている。

ダムの付帯施設についても個々の施設毎、損傷状況と処置方法が具体的に示されており、本調査団の診断調査も同様意見であるため、ここで省略する。ただ、今後のダム管理に向けて強調すべき事項、および以前までの診断と違った側面を見た意見を、以下に箇条書きする。

- ・ゲート施設に付属する油圧機器はすべて油圧の調整が出来ない。耐用年数が既に来て油圧系統の漏れがある。全て更新しなければならない。ゲート類の止水パッキンも同様である。
- ・ダムの上流斜面にある取水ゲートは現在オープンの状態にあるが、相当の長期(20年以上?)操作されていない。下流への送水を全面停止せざるを得ない場合、このゲートの操作が必要になる。ゲートの操作試験が望まれる。
- ・上記の取水ゲートが閉の状態へ操作できるか不明なため、灌漑導水路への送水量調整を行う取水塔直下流のラジアルゲートの修復の際には、取水塔内でのスルースゲート操作が必要になる。この操作には取水塔の天端にあるクレーンが使用される。しかしこのクレーンは過剰な荷重を与えた事故で損傷し、代替え施設としてH鋼台座とウインチが配置されている。この代替え施設も設計ミスで高さ不足があり、スルースゲートを操作できない状態である。
- ・このスルースゲートを操作するためには、①取水塔クレーンを作り直す、②H鋼台座を必要な高さに修復する、③スルースゲートを切断して小割りにして、現在のH鋼台座を利用してスルースゲートを操作できるようにし、ゲート自体はボルトで接合組み立てできる構造に変更する、の三方法が考えられる。経費、人力操作での安全性などを考慮すると、③の方法が推薦される。
- ・可能ならば日単位の貯水池水位データの蓄積が望まれる。流域内の降雨観測データと合わせて解析することにより、雨期の洪水予測が行えるようになる。

以上

ANNEX 15 農村給水調査結果

A.15.1 世帯数・世帯構成、人口

村名	調査世帯数 (H:ハッサニア語グループ P:プール語グループ)	聞き取りによる 集落世帯数	調査世帯 平均人数	推計 集落人口	フーム・グレイタ町データ(2007)		
					世帯数	人口	世帯人数
El Adala	3 (H:1, P:2)	160	9	1,440	232	1,464	6.3
Lehseye	3 (H:1, P:2)	125	8	1,000	83	463	5.6
Eheldidi	1 (H:1)	40	8	320			
Sabbhalla	2 (H:1, P:1)	120	7	840	146	766	5.2
Ehl Elbane	1 (H:1)	6	8	48			
Barrage Foum	1 (P:1)	5	10	50			
Mayjija I	1 (P:1)	45	8	360	43	393	9.1
Mayjija II	1 (H:1)	50	17	850			
Zreiga Adama	1 (P:1)	6	6	36			
Z'Hel El Hassen	2 (H:1, P:1)	60	9	540			
Z'reigat	2 (H:2)	65	11	715	99	471	4.8
Z'reigat Ehel Lehbib	1 (H:1)	6	15	90			
Essaada							
Megta D'Diom							
Tough T'ghir	1 (P:1)	40	10	400			
Aravatt							
Ehl Sidi El Hadi	1 (H:1)	20	10	200			
El WIHDA	3 (H:1, P:2)	140	10	1,400	107	1,289	12.0
D'Dakhla	3 (H:2, P:1)	425	10	4,250	254	1,593	6.3
Foum Gleita	4 (H:2, P:2)	858	15	12,870	731	2,697	3.7
入植地 計	16	1,035	9.3	9,645	921	6,046	6.6
計	31	2,171	11.7	25,409			

注) 網掛けの村は以前の (SONADER による) 入植地

出典: 本調査

A.15.2 公共施設

村名	井戸	小学校	診療所	モスク	備考
El Adala	○	○	施薬人	○	小学校は収容能力不足
Lehseye		○		○	小学校は収容能力不足
Eheldidi					
Sabbhalla		○		○	小学校は収容能力不足
Ehl Elbane					
Barrage Foum					
Mayjija I					
Mayjija II					
Zreiga Adama					
Z'Hel El Hassen		○		○	小学校は収容能力不足
Z'reigat			施薬人	○	
Z'reigat Ehel Lehbib					
Essaada					農民は離村し、現在は荒地
Megta D'Diom					農民は離村し、現在は荒地
Tough T'ghir					
Aravatt					農民は離村し、現在は荒地
Ehl Sidi El Hadi					
El WIHDA	○	○		○	小学校は収容能力不足、井戸の能力は需要に対応していない
D'Dakhla	○	○	○ (Foum Gleita の支所)	○	調査時には足踏みポンプ故障中
Foum Gleita		○	○	○	

注) 網掛けを行った集落は SONADER が設けた入植地 出典：本調査
 施薬人：フーム・グレイタの診療所に指名され、薬品を村民に販売する

A.15.3 日常生活で直面している困難さ

分類項目	度数	詳細
飲料水	(28)	井戸のある ELWIHDA を除いてすべての回答者が飲料水を優先度の高い問題にあげている。ただし、飲料水供給施設建設にかかる調査であることを事前に告げていることから回答に対する信頼度は低い。
保健衛生	21	医療態勢の不備(19)、妊産婦保健医療の不備、蚊が非常に多い
教育	17	学校施設能力不足(15)、低水準教育 (2)
営農	15	鳥及び家畜による害 (8)、農業投入材の不足 (3)、農地の不足(2)、収穫後処理施設、農産物販売
灌漑施設	13	用水の不足(8)、施設の老朽化(2)、不適切利用、排水設備不備、不十分な農地保護
交通	11	交通の便が悪い (9)、地域の孤立化 (2)
井戸	3	能力不足(2)、維持管理不良
貧困	3	低生活水準、子供の栄養不良、少ない就業機会
制度	1	財政援助や借入金の不透明さ
モスク	1	モスクの不備

注) 回答者数 31 で複数回答

A.15.4 疾病

症状	関連が疑われる水関連疾病の例	回答数
下痢	伝染性下痢症	29
眼病	トラコーマ?	24
発熱	マラリア	28
血尿		19
消化器疾患	チフス? 寄生虫症	15
皮膚病	疥癬	27

注) 回答者数 31 で複数回答

出典：本調査

A.15.5 水源(調査対象地区の住民が生活用水)

水源	使用世帯数
用水路	30
井戸	13
ゴルゴル川	23
潤川等 (雨期のみ)	2
ANEPA によるタンク車給水	5

注) 回答者数 31 で複数回答

出典：本調査

A.15.6 水源までの距離及び水汲み時間

水源	距離 (km)				時間 (時間)			
	回答数	最短	最長	中央値	回答数	最短	最長	中央値
用水路	29	0.3	4	0.5	29	0.1	3	1
井戸	12	0.1	8	1.3	12	0.2	5	1
ゴルゴル川	22	0.3	4	2	17	1	5	2

出典：本調査

A.15.7 水汲み量及び運搬

一人一日当水量 (ℓ)	回答者数
<10	2
10-20	5
20-30	8
30-40	4
40-50	2
50-60	6
60-70	2
70<=	1

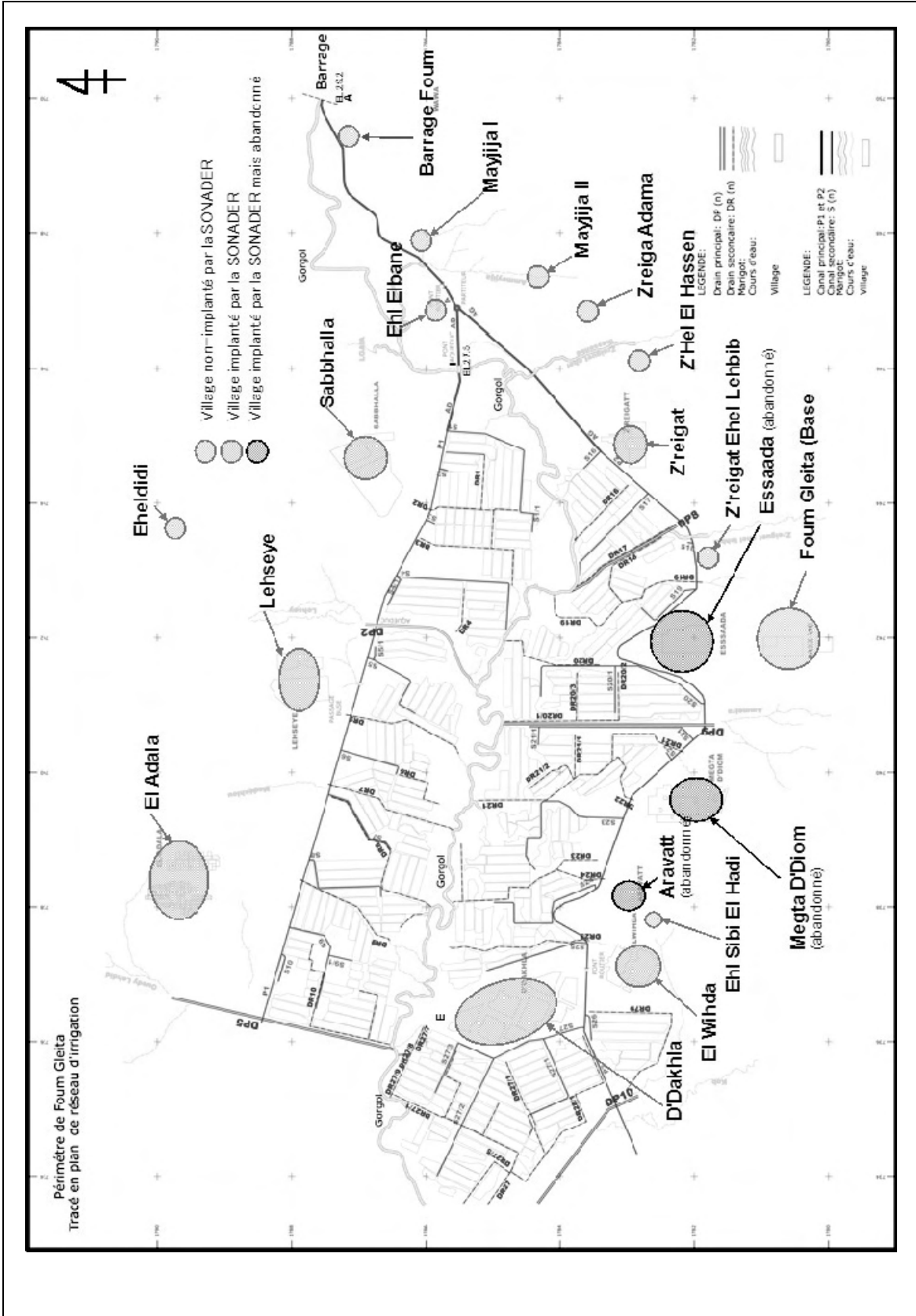
出典：本調査

A.15.8 水利用

水利用目的	世帯数
飲用	31
調理	31
食器等の洗浄	31
衣服の洗濯	8
水浴	8
家畜給水	5
菜園への散水	1

注) 回答者数 31 で複数回答

出典：本調査



ANNEX 16 参加型ワークショップ

本調査の中では、農民のオーナーシップ醸成のためには十分な情報提供が不可欠との判断から、JICA 調査団及び SONADER フーム・グレイタ事務所のイニシアチブの下、フーム・グレイタ灌漑地区を利用する農民組合の代表者を集めての大規模な参加型ワークショップを、調査開始時、実証調査開始前及び最終現地調査終了時の合計 3 回実施した。

A.16.1 調査開始時のワークショップ

(1) 概要

ワークショップの主な目的は、1.リハビリ事業を実施した場合、農民が施設を維持管理する意思があるかどうかの確認、2.実証調査参加の意欲の確認であった。当日は調査団、30 名弱の女性も含め、総数 80 名を超える参加者を数えた。参加者の 6 割程度が用いるハッサニア語及び 4 割程度が用いるプラー語を使用してのワークショップとなり、活発な議論が行われた。

テーマ： フーム・グレイタ灌漑地区のより良い運営・管理について

開催日： 2009 年 1 月 21 日

開催場所： フーム・グレイタ市会議室

参加者： SONADER フーム・グレイタ事務所職員、ユニオン代表、各農民組合代表
JICA 調査団員（参加者リストについては ANNEX 17 参照）

農民組合代表数： 69 農民組合（男性組合：42 組合、女性組合：27 組合）

(2) ワークショップでの確認事項

ワークショップの結果、確認できた事項と課題について表 4.2.1 に示す。参加者の総意として、『かつては灌漑農業の経験もなく施設の重要性も認識していなかったが、現在は灌漑農業が最重要な生活の糧であり、維持管理の重要性についても理解している。このため小規模な修復は自ら行っているし維持管理費を支払う用意もある』ということが確認できた。また、調査団としては来年度実施予定の実証調査についての協力を要請すると共に、実証調査の実施についても同意が得られた。

表 A.16.1 フーム・グレイタ灌漑地区の確認事項と課題

確認できた事項	課題
<p>1.水利施設の点検・修理</p> <p>作付前・作付中に巡視を行っており、2次、3次水路で簡易な修理が必要な箇所はすぐに手当とする。メンバーから集金しパワーシャベルをレンタルして浚渫作業を行ったこともある。1次水路についてもできる範囲で人員を動員しているが、規模の大きい被害については対応を政府に要請する。</p>	<p>現在耕作されていない地区でどこまで対応できるかは不透明である。施設の安全性確認のための巡視を制度化すべきである。また、SONADERの果たすべき役割についても明確にする必要がある。</p>
<p>2.水路の草刈・浚渫</p> <p>草刈は1次、2次、3次とも実施可能であり、これまでも行ってきた。2008年は合計2,500人・日/年をボランティアベースで動員し、水路の除草に当たった。浚渫は3次水路のみ可能で、1次、二次水路は人力では困難。</p>	<p>現在耕作されていない地区でどこまで対応できるかは不透明である。また、1次水路の浚渫は人力では困難、二次水路についてはトライアルが必要である。</p>
<p>3.維持管理労務作業に不参加の場合のペナルティ</p> <p>組合毎に一定のルールがあり、ペナルティのある組合もある。</p>	<p>ルールを明確化し、ペナルティも設ける必要がある。組織強化の一部として実施していく必要がある。</p>
<p>4.動物からの水利施設の保護</p> <p>保護のためにはフェンスと動物用の水飲み場が必要である。フェンスは金属製のものが望ましい。自然のイバラについては、木の伐採が禁じられていること、ネズミの類には有効でないことなどが挙げられた。</p>	<p>水飲み場、家畜よけフェンスを設ける必要がある。</p>
<p>5.水利費の支払い</p> <p>支払う用意はある。ただし有効に使用されることが条件であり、徴収金は適切に管理されなければならない。</p>	<p>ほとんどのWS参加者が力強く意思表示をしたが、現在耕作されていない地区でどこまで対応できるかは不透明である。</p>
<p>6.災害対策</p> <p>家畜を売ること急場をしのげる者もいるが少数である。大規模な被害の場合はユニオンから政府に対応を要請する。また、UNCACEM・SONADER・ユニオンでローンは返済繰り延べを協議する場合もある。かつては災害対策費を徴収していた組合もあった。</p>	<p>洪水被害の影響を把握し、必要なら洪水等災害・緊急時のための災害対策費の積み立てを検討していく。また、SONADERの果たすべき役割についても明確にする必要がある。</p>
<p>7.栽培管理・水管理</p> <p>作付前には組合レベルで話し合いを持ち、組織的に営農を行っている。栽培管理・水管理の重要性は理解しているものの、現在は水不足のため、幹線レベルでの調整は行っていない。しかし水が十分配水されるようになれば計画に従ってそれらを行う。</p>	<p>水が掛かるようになった場合、幹線レベルでどこまで調整できるか不透明である。</p>
<p>8.組織強化</p> <p>かつて灌漑水が十分あり、収穫があがっていた頃は1.2億UMもの残高を銀行に保有していたこともあり、組織運営もうまくいっていた。しかし施設の機能低下に従い、組織の役割も限定的になっていった。</p>	<p>組合、ユニオンの規約の再検討、メンバーのリスト作り、耕作権所有者の整理、会計制度の透明化、集会の実施等を通じて組織強化を図る。</p>
<p>9.実証調査への合意</p> <p>調査団が実証調査の枠組みを説明し、了承を得た。全参加者とも積極的な参加の意思を示した。</p>	<p>実証調査内容の具体化、サイトの選定等を行っていく。</p>

A.16.2 実証調査開始前のワークショップ

(1) 概要

ワークショップの主な目的は、1.実証調査の内容、2.各調査項目の実施サイト、及び3.実施方法について説明し、合意形成することであった。当日は調査団、SONADER 職員、30名弱の女性も含め、総数80名を超える参加者を数えた。前回同様、ハッサニア語及びプラー語を使用したワークショップとなり、活発な議論が行われた。

テーマ： 実証調査の内容・サイト・実施方法について
 開催日： 2009年6月11日
 開催場所： フーム・グレイタ SONADER 集会所
 参加者： SONADER フーム・グレイタ事務所職員、ユニオン代表、各農民組合代表
 JICA 調査団員（参加者リストについては ANNEX 17 参照）
 農民組合代表数： 55 農民組合（男性組合：32 組合、女性組合：23 組合）

(2) ワークショップでの確認事項

ワークショップの結果、確認できた事項と課題を表 4.2.2 に示す。実証調査の内容、サイト、実施方法については概ね理解が得られたものの、参加型灌漑施設の維持管理作業についての労務費及び水利費支払い再開については、費用の管理方法について議論が錯綜し今後の課題として残った。これは、ユニオンが十分機能しておらず、一方農民は上部組織に管理体制の不備を感じており、資金管理の透明性の確保に不安を抱いていることに起因するようである。

また、調査団としては今後も定期的にワークショップを実施し、農民との信頼関係の確立、農民の意識の向上を図っていく必要があるとの認識を強くした。

表 A16.2 実証調査についての確認事項と課題

確認できた事項	課題
1.参加型灌漑施設の維持管理 参加型で各種灌漑施設維持管理作業を行うこと、その必要性、各々の作業の実施サイトについては基本的な合意が得られた。	作業の中で農民に支払う労務費の支払い・管理方法、及び水利費の徴収については引き続き協議することとなった。要望として、資機材はできるだけ地元で調達すること、実施サイトを増やして欲しい等があげられた。
2.展示圃場を中心とした普及活動 展示圃場で稲作、果樹、野菜の試験栽培を行うこと、その実施サイト、インプットは調査団が提供するがその分収穫から内部留保することについて基本的な合意が得られた。	特になし。
3.再委託業務 再委託による緊急工事及び測量業務を実施すること、そのため6/25から最大2週間幹線水路の水を止めることについて基本的な合意が得られた。	被害が発生しないことが明らかであるにもかかわらず、便乗して止水期間の補償を求める者が相次いだ。6/25までに必要な作業を終えることで合意した。

A.16.3 最終現地調査終了時のワークショップ

(1) 概要

ワークショップの主な目的は、1.調査結果の概要説明、2.新しい形のユニオンの提案であった。当日は SONADER スタッフ、調査団を除き、総数 80 名を超える参加者を得た。

テーマ： 調査結果の説明及び新ユニオンの提案

開催日： 2010 年 6 月 3 日

開催場所： フーム・グレイタ市庁舎庭

参加者： SONADER フーム・グレイタ事務所職員、ユニオン代表、各農民組合代表
JICA 調査団員（参加者リストについては ANNEX 17 参照）

農民組合代表数： 33 農民組合

(2) ワークショップでの確認事項

調査結果の説明については、概ね理解を得られ、また、調査結果そのものを農民にフィードバックしたことについては、これまでにない画期的なこととして高い評価を得た。新しいユニオンを 1 つとするか、2 つとするかで、調査団から提示した折衷案（2 つの独立した組織の上に調整委員会を設け、形としては 1 つのユニオンとする）には、一部の農民グループが難色を示した。SONADER、地方政府、農民グループが協力し、解決に向け努力することとなった。

ANNEX 17 ワークショップ参加者リスト

2009年1月21日 於：フーム・グレイタ市会議室

	氏名 Prénom et Nom	肩書 Titre	組合名 Coopérative	女性組合or男性組合 Coopérative Féminine ou Masculine	所在村名 Village
1	Djibril Ousmane Kane	Chef Antenne PP	SONADER	-	Foum-Gleita
2	Idoumou Ould Ethmane	AVB	SONADER	-	CENTRE
3	Javaar Ould Hassene	AVB	SONADER	-	CENTRE
4	Ba Samba Yéné	AVB	SONADER	-	Foum-Gleita
5	Mohamed Vall Ould Wori	AVB	SONADER	-	Foum-Gleita
6	Dia Abdoul	Membre	UCAF	-	Bachat Ould Boughrou
7	Ba Samba Yéné	Pdt CSC	UCAF	-	Bachat Ould Boughrou
8	Khalidou Allassane	Vice-President	UCAF	-	Foum-Gleita
9	Abdoulaye Harouna Ba	Animateur ONG	SOS generation future	-	Foum-Gleita
10	Melaimine Ould Touhami	Paysan	AFPD	-	Foum-Gleita
11	Seck Papa	President	GASP	-	Foum-Gleita
12	Zegouma Mint Sensed	Presidente	Hel Hachem	Féminine	Adala
13	Mariam Mamadou	Presidente	Ousman	Féminine	Adala
14	Modv Siré Ba	Paysan	El bassra	Masculine	Adala
15	Ba Mamadou Ousmane	Paysan	Najah Kissal	Masculine	Adala
16	El Hasnia Mint Samba	Presidente	Bachatt Centre Wai	Féminine	Bachat
17	Faty Dembele	Presidente	Bachatt Centre Weitare 1	Féminine	Bachat
18	Dandio Osmane	Presidente	Diama	Féminine	Bachat
19	Fatimetou Jarmouni	Presidente	Fadel 2 Bachat Centre	Féminine	Bachat
20	Fatimeou Mint Mahmoud	Presidente	Taidid	Féminine	Bachat
21	Dandio Mamadou	Presidente	Weltaré	Féminine	Bachat
22	Fatimetou Mint Messoud	Adjoint	Taghada	Masculine	Bachat
23	Yacob Ould Amar Sidi	President	Aemar Sidi	Masculine	Bachat
24	Alpha Mamadou	President	Boki 1	Masculine	Bachat
25	Mohamed Vall Soueidi	President	El Vowz	Masculine	Bachat
26	Demba Ould Messoud	President	El Wai	Masculine	Bachat
27	Ifra Samba Ramata	President	Hollaré	Masculine	Bachat
28	Mohamed Ould Med El Abed	President	Medina	Masculine	Bachat
29	Rabani Ould Grive	Tresorier	Nasroune	Masculine	Bachat
30	Aissata Oumar	Presidente	Arndendv	Féminine	Bachat Ould Boughrou
31	Penda Barry	Adjoint	Potal	Masculine	Bachat Ould Boughrou
32	Younouss Malal	President	Boki 2	Masculine	Bachat Ould Boughrou
33	Idi Labo Diallo	President	Diam-Diam	Masculine	Bachat Ould Boughrou
34	Sow Saidou Yéro	President	Pellital	Masculine	Bachat Ould Boughrou
35	Mohamed Vall	SG	Nasroun	Masculine	Bachat Ould Boughrou
36	Ekhdeije Mint Houssein	Vice-President	Nejah	Masculine	Bachat Ould Boughrou
37	Teslem Mint Rweijel	Presidente	Lehsev	Féminine	Bagdad
38	Nezihe Mint Jaavar	Presidente	Madekhlou	Féminine	Bagdad
39	Mekfoula Mint Mohamed	Presidente	Medekhlou 2	Féminine	Bagdad
40	Mbarka Mint Khouna	Adjoint	Bagdada	Masculine	Bagdad
41	Yaya Samba	President	Yakare	Masculine	Bagdad
42	Abderah.Ane Ould Rabah	President	Rahma	Masculine	Chantier
43	Oumar Sinbingué	Paysan	Bamta Aré	Masculine	Chantier / Base-Vie
44	Fatimetou Mint Mattala	Presidente	Bob Jaavar	Féminine	Cow Jaffar
45	Limame Ould Blal	Membre	Taghadoum	Masculine	Cow Jaffar
46	Sidi Ould Moulave Chrive	President	Nour	Masculine	Ezreighat
47	Moulave Ould El Hassene	President	Teissir	Masculine	Ezreighat
48	Aichete Meslem	Presidente	Lib Heiga	Féminine	Ezreighat Hel Didi
49	Khadiata Mamadou	Presidente	Diokere Ndama	Féminine	Foum-Gleita
50	Mana Mint Ahmed Moloud	Presidente	El Vayzat	Féminine	Foum-Gleita
51	Dioulde Mint Mamy	Presidente	Velah Vivaj	Féminine	Foum-Gleita
52	Faty Moussa	Presidente	Zeheb	Féminine	Foum-Gleita
53	Cheikh Ould Mbareck	Secrétaire	Nejah	Féminine	Foum-Gleita
54	Salamata Hamat	Adjoint	Wihde Bedel	Masculine	Foum-Gleita
55	Allassane Pathé	Paysan	Salem	Masculine	Foum-Gleita
56	Abass Ibn Cheikh Baheida	Paysan	Sed Elkheir	Masculine	Foum-Gleita
57	Mohamed Mahmoud Inejih	Paysan	Teissir	Masculine	Foum-Gleita
58	Abdallah Ould Maiziz	Paysan	x	Masculine	Foum-Gleita
59	Baba Ould Ethmane Ould Sidi	President	Ithad	Masculine	Foum-Gleita
60	Aicha Mint Diav	Presidente	El Emen Etahadoum	Féminine	Jedida

	氏名 Prénom et Nom	肩書 Titre	組合名 Coopérative	女性組合or男性組合 Coopérative Féminine ou Masculine	所在村名 Village
61	Javaar Ould El Yamani	President	Veth	Masculine	Kob Ehel Yamani
62	Cheikh Ould Vallah	President	Inimich	Masculine	Kob Jaavar
63	Meimouna Mint Khouna	Presidente	Berakatt	Féminine	Lehsey
64	Cheikh Elbou Itouhami	President	Elbaraka	Masculine	Lehsey
65	Youma Mint Sid Elkheir	Paysane	Chilouhvchi	Féminine	Moiijje
66	Lalla Mint Boibahi	Paysane	x	Féminine	Moiijje
67	Zeinebou Mint Oumar Kelly	Presidente	Sabhala	Féminine	Sabhalla
68	Chreiva Mint Sihe	Presidente	Dar Selam	Féminine	Sabhalla
69	Jafar Hommany	Paysan	Elwihda	Masculine	Sabhalla
70	Al Hasnia Mint Touhai	Secrétaire	Nour	Féminine	Tarhil Wechkech
71	Cou.Ba Guelou	Adjoint	Dar Selam	Masculine	Tarhil Wechkech
72	Lala Mint Beilaly	Presidente	Tekfelitt	Féminine	Tekfelitt
73	Khadija Mint Mreizig	Adjoint	Nejah	Masculine	Tekfelitt
74	Cheikh Ould Bouh Sneiba	Paysan	Salem	Masculine	Tikielté
75	Sidi Mohamed Ould Nasse	x	x	Masculine	x

2009年6月11日 於：フーム・グレイタSONADER集会所

	Nom et prénom 氏名	Coopérative 組合	Fonction 肩書
1	Abdallahi ould Gueye	SONADER	Chef d'antenne
2	Chérif ould Yemany	UCAF	Président
3	Djibril Ousmane Kane	SONADER	C.S.Vulgarisation
4	Samba Yéné	SONADER	AVB
5	Dia Saidou Samba	UCAF	Membre
6	Mohamed ould Mahmoud	Nasroun	Président
7	Ifra Samba Ramata	Holaré	Président
8	Khalidou Dembely	Pinal	Président
9	Cheikh El Bou ould Touhami	El Barakatt	Président
10	Sid Ahmed ould Nass	Nejah	Président
11	Khalidou Alassane	UCAF	Vice president
12	Mohamed Ahmed ould Mbarek	Nimiss	Vice president
13	Yakhoub ould Amar Sidi	Amar Sidi	Président
14	Oumar Simbine	Bamtaaré	Président
15	Baba ould Eleyat	Rahma	Membre
16	Haidé ould Mohamed	Nour	Membre
17	Mohamed Lemine ould Moussa	Nour	Membre
18	Bocar Samba	Rahma	Membre
19	Yaraa ould Samba	El Wai	Trésorier
20	Idi Laba Diallo	Zem Zem	Président
21	Diouldé Hamadi	Holaaré	Magasinier(2)
22	Mody Ciré Ba	Al Basra	Président
23	Mohamed Mahmoud ould Mohamed El Abd	Médina	Président
24	Ahmed Vall ould Sidi	El Vowz	Président
25	Demba ould Messoud	Takhada	Président
26	Sidi Mohamed ould Jiddou	Fédéral	Vice president
27	Younous Malal	Bokki 2	Président
28	Sidi Mohamed ould Moulaye Chérif	Nour	Président
29	Salem ould Bilal	Ndoula	Membre
30	Jaafar ould El Yemany	El Veth	Président
31	Sidi ould El Ndiayane	Lehseye 1	Président
32	Abdallah ould Taleb	Sona	Président
33	Mahfoudh ould Mahmoud	Maatar F.Gleita	Vice president
34	Mamadou Ousmane Ba	Nezzah Kissal	Président
35	Mohamed ould Sansed	Itihad	Magasinier
36	Daouda Mamadou	Bamtaaré Loboudou	Secrétaire
37	Houssein ould Khairalla	Nezaha	Vice president
38	Jaavar ould El Hacen	SONADER	AVB
39	Brahim ould Abderahmane	Tahara	Vice president
40	Jaavar ould Chérif	Nour	Membre
41	Samba ould Mahmoud	Nour	Membre
42	Zeinebou mint Khallé	Nasroun	Président
43	Khadija Mint Mbarek	Amar Sidi	Présidente
44	Hasniya Mint Samba	El Wai	Présidente
45	Mama Mint Habib	El Emen	Trésorière
46	Aichetou mint Dah	El Emen	Présidente
47	Toutou Mint Benna	Besmana	Présidente
48	Fatimetou Mint Abdel Kerim	Médina	Présidente
49	Binte Mint Mbarek	Médina	Vice president
50	Aissata Diallo	Pellital	Présidente

	Nom et prénom 氏名	Coopérative 組合	Fonction 肩書
51	Fati moussa	Zeheb	Présidente
52	Dagndo Mamoudou	Weltaaré Bokki	Présidente
53	Haby Mamadou	Diokéré Endam	Trésorière
54	Fati Demba	Weltaaré 1	Présidente
55	Sogui Malal	Weltaaré 1	Trésorière
56	Zeinebou Mint oumar Kelly	Sabhalla El Hacén	Présidente
57	Dagndo ousmane	Diama	Présidente
58	Lalla mint Bathy	Tahkhikh	Présidente
59	Mona Mint Ahmed Maaloum	Vaizad	Présidente
60	Fatimetou Mint Tbakhje	Vaizad	Vice president
61	Fatimetou mint Mahmoud	Tejdid	Présidente
62	Fati Aliou	Teyssir Lissa	Présidente
63	Metou Mint Boubacar	El Wihda	Vice president
64	Aichetou Mint Oumar	El Wihda	Membre
65	Aiché Mint Ndiaye	El Amel Wo Takhadoum	Présidente
66	Khadijetou Fall	El Amel Wo Takhadoum	Sécretaire
67	Taleb ould Abeidallah	Dar Es Salam 1	Sec.Général
68	Abdalla ould El Mowji	Dar Es Salam 2	Vice president
69	Abdel Kerim	Dar Es Salam 2	Magasinier
70	Mbarek ould Mbarek	Dar Es Salam 2	Membre
71	Cheikh ould Salem	El Wihda	Magasinier
72	Idoumou ould Ethmane	SONADER	AVB
73	Leila mint Mohamed El Ide	Nour femme 2	Présidente
74	Leila Mint Mbarek	Nour 1	Présidente
75	Bouba Mint El Kory	Nour 1	Trésorière
76	El Hacén ould Mohamed	Lellihde Temiye	Membre

(参加者リスト記名順)

2010年6月3日 於：フーム・グレイタ市庁舎庭

	Prénom et Nom 氏名	Coopérative 組合	Titre 肩書	Village 所在村名
1	Moustapja Ould Ejer	Taghadoum	Membre	Kew
2	Mohamed Ould Bil	Itihad	Paysan	Zreiga
3	Abade Ould Ghati	Sans	Paysan	Kew
4	Moctar Ould Makhai	Hollare	Membre	Bachatt
5	Boudaye Ould Med	Mbedia	President	Bachatt
6	Ahmed Ould Elbou	Itihad	Membre	Zreiga
7	Amadou Salek	Itihad	Membre	Zreiga
8	Samba Ould Ely	Teissir	Membre	Zreiga
9	Yero Sall	Teissir	Membre	Zreiga
10	Moctar Ould Makhai	Teissir	Membre	Bachatt
11	Taleb Ould Moilid	Pelital	Membre	Oudey Lehdid
12	Mamadou Mbagne	Salam	Membre	Bachatt
13	Mohamed Ould Sidi	El Wai	Membre	Bachatt
14	Mamadou Mbagne	El Vowz	Membre	Oudey Lehdid
15	Cheikh Elbou Ould Sneiba	El Veth	President	Dar Salam
16	Med Mahmoud Ould Hach	Zemzem	President	Bachatt
17	Sidi Med Ould Cherif	Nijah	Secrétaire	Oudey Lehdid
18	Hacen Ould Yemani	Itihad	Membre	Zreiga
19	Hacen Ould Med	Zrega	Vice President	Bachatt
20	Sidi Ould Mreizig	El Wai	President	Oudey Lehdid
21	Samba Ould Ely	Dar Selam	Vice President	Itihad
22	Yero Sall	Nour	Membre	Bachatt
23	Djibi Sire Ba	Tageda	President	Bachatt
24	Dia Seradi Forba	Teissir	Vice President	Bachatt
25	Touhamu Puld Sidi	Zrega	Membre	Bachatt
26	Alpha Mamadou	Bachat	Vice President	Adalla
27	Feido Yew	Kow	Membre	Adalla
28	Dedaha Ould Yeba	Pelital	Membre	Zreiga
29	Med Ouldoumar	Tagadoum	Vice President	Oudey Lehdid
30	Limame Ould Bela	El Vowz	Membre	Bachatt
31	Sid Ahmed Ould Abeid	Inimich	Vice President	Adalla
32	Sidi Ould Ahmed	Inimich	Membre	Oudey Lehdid
33	Yacoub Ousmane Ba	Nour Selam	Vice President	Inimich
34	Rajel Ould Brafa	Bokki 1	Membre	Inimich
35	Moctar Ould Makhai	Bokk 2	President	Inimich
36	Oumar Khliwri	Nasroune	Membre	Inimich
37	Boudaye Ould Med	Nasroune	Vice President	Inimich
38	Mamadou Mbagne	Hollare	Membre	Inimich
39	Nagi Ould Ahmed	Inimich	Membre	Teissir
40	Daouda Mamadou	Inimich	Membre	Nour
41	Alpha Mamadou	Inimich	Membre	Oudey Lehdid
42	Moustapja Ould Ejer	Pelital	Secrétaire	Adalla
43	Oumar Khliwri	Pelital	Membre	Adalla
44	Boudaye Ould Med	Mbedia	Secrétaire	Adalla
45	Elkadi Ould Med	Mbeidiatt	Vice President	Zreiga
46	Dah Ould Khaide	Zrei	Membre	Sabhalla
47	Sidi Med Ould Cherif	Zreiga	Paysan	Sabhalla
48	Molouye Bade	Tedamoune	Secrétaire	Sabhalla
49	Limame Ould Bela	Tagada	President	Sabhalla
50	Nero Sow	Itihad	Secrétaire	Wechkech
51	Boudaye Ould Med	Itihad	Membre	Wechkech
52	Ledom Aliou	Elwihde	Paysan	Kew
53	Feido Yew	El Wai	Paysan	Kew
54	Serbat Ould Ali	Nejah	Vice President	Kew

	Prénom et Nom 氏名	Coopérative 組合	Titre 肩書	Village 所在村名
55	Demba Ould Med	Itihad	Secrétaire	Kew
56	Samba Ould Ely	Nejah	Membre	Zreiga
57	Moullaye Ould Limame	Pelital	Membre	Bachatt
58	Yacoub Ould Amar Sidi	Hollare	Membre	Tagadoume
59	Selmou Ould Hacén	Wai	Membre	Sabhalla
60	Moctar Ould Makhai	Tadamoune	Membre	Sabhalla
61	Demba Ould Med	El Nour	Membre	Sabhalla
62	Sow Djiby	Inimich	Président	Bachatt
63	El Hacén Ould Mohamed	El Vowz	Membre	Teissir
64	Tijani Samba	Salam	Président	Bachatt
65	Mohamed Ould Ahmed	Medina	Membre	Bachatt
66	Melainine Ould Jaavar	Ong Afpd	Membre	Foum Gleita
67	Moctar Ould Sidaty	Itihad	Président	Bachatt
68	Isselmou Ould Yacoub	Amar Sidi	Président	Bachatt
69	Ethmane Elemine Sidi	Dar Selam	Paysan	Sabhalla
70	Jedou Ould Cherva	Dar Selam	Paysan	Sabhalla
71	Sidina Ould Samba	Inimich	Paysan	Tachil Wechkech
72	Selemb Ould Sneiba	Inimich	Membre	Kew
73	Amadou Alasane	Inimich	Président	Kew
74	Moulaye Ould Bena	Inimich	Membre	Kew
75	Djibi Sire Ba	Lehsey	Membre	Tohde
76	Moulaye Hachem	Teissir	Président	Zreiga
77	Cherif Ould Med	Itihad	Membre	Sabhalla
78	Jaafar Ould Cherif	Nour	Membre	Wechkech
79	Daouda Mamadou	Medina	Président	Bachatt
80	Daoude Med Saleck	Nizam	Membre	Bachatt
81	Mody Cire Ba	Basra	Président	Oudey Lehdid