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Agricultural Institutional Framework

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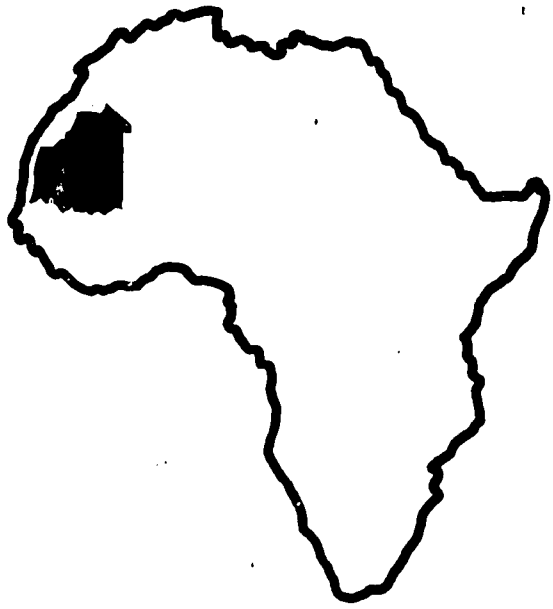

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List of Acronyms Used

BEM	Brevet de l'Enseignement Moyen
BT	Brevet Technicien
CAA	Commissariat de l'Aide Alimentaire
CER	Centre d'Expansion Rurale (Rural Outreach Center)
CES	Conservation des Eaux et du Sol
CNERV	Centre National d'Elevage et de Recherche Veterinaire (Nouakchott - El Ksar)
CNRADA	Centre National de Recherche Agronomique et du Developpement Agricole (Kaedi)
ENFVA	Ecole Nationale de Formation et de Vulgarisation Agricole
FAC	Food and Agriculture Organization of the U.N.
FND	Fonds National de Developpement
OMC	Office Mauritanien des Cereales
OMVS	Office de la Mise en Valeur de la Vallee du Senegal
ONP	Office National des Peches
MDR	Ministere du Developpement Rural
SONADER	Societe Nationale du Developpement Rural
SONICOB	Societe Nationale de l'Industrie et de la Commercialisation du Betail.
UBT	Unite de Betail Tropicale (Tropical Livestock Unit)
	(Banque Arab pour le Developpement) Arab Development Bank
UNDP	United Nations Development Program
USAID	United State Agency for International Development
WAEC	West African Economic Community

Summary and Conclusions

1. This study proposes to clarify the nature of the options the Mauritanian Government will have to consider with regard to the institutional framework of the rural sector in order to attain the development objectives it has set. The study has, above all, emphasized the reorientation and adaptation of existing structures to make them more operational and in order that they can respond to new demands created by the need for a harmonious, sustained and self-generated development.

2. A study of the present framework of rural production through the set of studies RAMS has undertaken makes it possible to identify a number of technical and human constraints affecting various aspects of production and whose evolution would most likely generate:

2.1 A continuing decline in the possibilities of developing the production area; resulting from irrational exploitation of environments, insufficient knowledge of the latter and the inadaptability of production techniques.

2.2 Discouragement of human labor to develop rural areas once the foregoing is recognized, accentuated by unfavorable climatic occurences, combined with the fact that the local community is divorced from the existing political system.

2.3 Extreme difficulty in making realistic plans for the entire rural sector or in providing good management of the economy as a result of the lack of a policy of action and support for the rural sector and the inadequacy and inappropriateness of existing structures to meet development needs: this is further by the insufficiency or non-existence of support facilities in a complicated environment where production areas are widely scattered.

3. Moreover, the study bears out the realization that human constraints are the most limiting.

Three options have been presented as solutions to existing problems. These options emphasize the need to respond to the human constraints. They are as follows:

3.1 The first option (Option A) is oriented towards the accelerated and systematic development of the rural sector and calls for a sust

potentials, i.e., it is oriented towards a centralized approach which assumes a political will to focus on the rural sector. In the first place, it presupposes the establishment of basic structures and the strengthening of the public sector's capacity to take action. It stresses the integration of the different structures involved in rural development and the establishment of encouraging and supportive measures for the rural sector.

This option was conceived to go hand-in-hand with the most optimistic production objectives which aim at food self-sufficiency and economic independence by year 2000 and which assumes:

- Cereal production growth at an average rate of 20% per annum between 1980 and 2000;
- the doubling of the livestock population, which should grow from 2.2 to 4.5 million UBT (Unite de Betail Tropicale) (1)
- an increase in date palms at the rate of about 6.5% per annum between 1980 and 2000, with even export possibilities;
- maximum growth of industrial fishing, which should have a positive effect on the balance of payments.

3.2 The second Option (Option B) is oriented towards regional or decentralized integrated development going through successive stages favoring localized action, to keep into account the complexity of the physical and human environment. It proposes the establishment of networks of potential development sites and demands the gradual adaptation of the rural development structures to new development requirements, within the Mauritanian context.

The approach used stresses the integration of the various aspects of rural development at the lowest levels which are considered to be the starting point of any development effort.

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1) Unite de Betail Tropicale:
1 camel = 1 UBT
1 mature cow = 0.75 UBT
1 sheep/goat = 0.15 UBT

This option should go hand-in-hand with planned production objectives which seem to be the most realistic considering the actual condition of the rural sector. These objectives point to long-term food self-sufficiency and economic independence. In particular they assume that by year 2000 the following will have been achieved:

- the satisfaction of at least 67% of the cereal demand;
- an increase in productivity of about 25% in the livestock sub-sector;
- the protection and rehabilitation of the oasis agriculture whose productivity should double;
- the development of artisanal marine fishing, which should make use of the potential on the coast;
- the development of inland fisheries by associating fishing techniques with hydro-agricultural improvement in the Senegal River Valley.

3.3 The Third Option (Option C) is based on a continuation of present trends, with all its problems and shortcomings. This option takes cognizance of the present policies(1) which in theory have the following long-term targets;

- food self-sufficiency,
- the regeneration of the natural environment,
- population fixation.

Under the present conditions however, the projections of the different variables demonstrate that for production, the objectives that will be attained by year 2000, based on the most favorable assumptions, are as follows:

- In agriculture, cereal production will attain 43% of demand;
- In livestock, production will be determined chiefly by rainfall conditions; under the most favorable climatic

(1) Based on the Report of the Planning Commission for the Rural Sector, October 1980.

conditions and based on the hypothesis of moderate consumption, the demand for meat will exceed supply from 1995 on, and it will be necessary to make up for protein shortage by other sources;

- In oasis farming, date palm production will grow very slowly due to the entry of young plantations into production notably in the Assaba;

- In maritime artisanal fisheries, there will be a moderate rise in production, around 6.5% yearly, satisfying local demand;

- In land fisheries, stagnation of current levels is inevitable, taking into account the future construction of dams on the Senegal River.

4. A comparative analysis of the different options indicates that the financial resources required under those options are substantial, notably for options C and A (see Table 1).

For this reason, participation of the rural populations in financing their own development should be studied and defined from a very realistic perspective.

The costs of the various Options are distributed according to:

- training
- equipment
- operating
- credit

When compared to the increase in the value of production, results are:

- For Option A, production should grow at a rate of 4.8% per annum between 1980 and 2000, while the costs of the support measures will come to 2.1% of the value of production in 1980 and 8% in year 2000.

- For Option B, production should grow at a rate of about 2.5% per annum, while the costs of the support measures will represent between 2.1% of the value of production in 1980 and 4.2% in year 2000.

- For Option C, production will develop at the rate of 1.3% per annum while costs will rise 2.1% to 13.5% of the value of production.

From this comparison, it is evident that Option C is catastrophic and can not be justified economically. Options A and B would however, be economically acceptable based on a certain number of assumptions regarding productivity, reduction in training costs and improvement in road infrastructure which would tend to reduce training costs. Option B would follow less optimistic assumptions, i.e., more conservative ones than for Option A. After a certain stage of development, training costs for the different Options could decrease in order to channel such costs into other undertakings, such as the conversion of agricultural technicians into producers or "pilot" farmers, etc. At such a stage, benefits would greatly exceed costs, if only because of the effects brought about by training.

From the standpoint of human resource requirements, Option A and C would run into serious problems with regard to the availability of supervisory personnel (foremen and monitors), which is not true for Option B. These problems can be overcome only through one or the other of the following alternatives:

- A considerable increase in local training capacities which is the most costly, given the actual level of the costs of local formalized training.
- A major reform of the training systems for rural development with emphasis placed on non-formal training.
- Under either alternative, special attention must be given to adapting a training system to the development objectives and to increasing its efficiency.

Table 1

Financial Resources Required for The Different Options

	1985	1990	1995	2000
Option A_1	1 063	1 860	3 408	5 116
A_2	1 060	1 856	3 460	5 179
B	1 037	1 255	1 595	1 795
C	1 334	1 701	1,637	2 291

0. Introduction

0.1 Purpose

This study on Agricultural Institutional Framework is a companion piece to the Option Paper on Rural Production.

Its objective is to clarify the kinds of options the Mauritanian Government would have to consider with regard to the support elements for agriculture in order to attain its development goal. In other words, it brings out the impact of the options set forth in the Rural Production paper on the execution of specific measures. This relates to the fact that the studies conducted in the course of RAMS' Phase I revealed a broad range of problems and constraints involved in the institutional framework or rural production the elimination of which would be an extremely difficult and above all a costly undertaking; hence , the necessity of making a choice adapted to specific requirements.

The problems now being posed take shape due to the fact that the measures and institutions which, in theory, should facilitate and promote the development of the rural sector are actually hindering the process because they are not adapted to it. Three main implications arise from this situation:

- Increased deterioration of the environment and the land's resources, thereby reducing the technical potential of its development;
- Loss of interest by those involved in rural activities, therefore a loss of job possibilities in the rural sector;
- The impossibility of drawing up realistic plans for the sector as a whole and of effectively managing the economy.

Hence, this study does not focus on the creation of new institutions or the substitution of some by other; rather, it insists on a certain reorganization or adaptation of existing institutions in order ro render them more operational and permit them to overcome the problems that arise. In addition, since there has been much debate about the institutional problem in general, this review will take a second look at some of the ideas aired in previous studies. (2)

(2) Especially concerns the study on the Reorganization of the Ministry of Rural Development, FAO, April 1978.

0.2 Methodology

The approach used in this study follows two stages:

0.2.1 The first consists of pin-pointing the problem. This involves taking an inventory of the problems and constraints impeding rural production in the present context, noting those which will continue to impede it in the future. These problems will be regrouped into two sets and related to the principal factors involved in production activities which are:

- The spatial factor of production, i.e., the physical environment, its technical potential and the resources it offers, etc.
- The human factor, which is the active element making use of the potential and resources, its insertion into that space and its socio-economic environment which conditions the continuity of its activity in productive terms (organization, infrastructure, training facilities, economic policy, etc.)

These two factors are obviously closely linked. The sets of problems attributed to them should be considered jointly as an equation reflecting current problems of rural production.

0.2.2 The second phase is the search for the optimal solution to the constraints, keeping in mind the production goals as well as the realities of Mauritanian life. This search will be used on two main criteria:

- On the one hand, the relative importance of each constraint or set of constraints, with the most limiting constraints being analyzed first.
- On the other hand, the extent to which the constraints depend on one another.

Consequently, the option will tie in directly with those set forth in the Option Paper on Rural Production. This study, broadly speaking, will consist of three parts:

1. Production objectives in which a brief description will be provided indicating different levels of production under different assumptions.

2. A brief analysis of the problem, in which all the constraints hindering production - - derived from the analyses and studies prepared during RAMS' Phase I - - will be summarized.

3. The solution or possible solutions to the problem, in which the optimal manner of introducing suggested changes and laying the groundwork for their productive application will be described.

The last section of this study will include a brief comparative analysis of the possibilities and limitations of each of the options.

Chapter I Present Framework of Rural Production

This part of the study briefly describes the present conditions of production in the rural sector while examining the different problems found in the production sub-sectors, which are:

- the livestock sub-sector;
- the oasis agriculture sub-sector;
- the irrigated agriculture sub-sector;
- the dryland agriculture sub-sector;
- the artisanal, maritime and inland fisheries sub-sector.

Actually, the series of studies conducted during RAMS Phase I permitted the identification of a number of bottlenecks involving the various aspects of production. The most likely direction of these problems under present conditions, especially when combined with unfavorable climatic conditions, would lead to three main conclusions:

i- A decrease in the possibilities of developing the productive areas. This phenomenon emerges because of an irriational utilization of resources (water, soil, vegetation), due to poor knowledge of the latter and the absence of personnel to monitor their utilization; it is reflected in the deterioration and consequent reduction of technical possibilities for developing the environment;

ii- Labor's discouragement with regard to rural activities, following the loss of technical possibilities of the environment, especially since supportive facilities are lacking and there is no apparent rational action being taken to improve the situation. This element is dramatized by unfavorable climatic conditions and by conflicts which exist between the different groups (livestock raisers and farmers, for example, or professional fishermen and part-time fishermen); it is reflected in an exodus to urban centers, in migration and in a reduction of job opportunities in the rural sector.

iii - The difficulty of drafting a realistic plan for the rural sector on the whole and properly managing the economy. This is due to the absence of a plan of action and support for the rural sector, as well as the insufficiency of information on development activities.

In summary, the various problems and constraints characterisizing the present framework of rural production are numerous, and their seriousness varies from one to the other. They can be classified under two headings which characterized every system of production;

- technical constraints
- human constraints.

1.1 Technical Constraints

These constraints relate to the physical environment, or the productive areas and its technical possibilities. These environment is characterized by the marked fragility of its natural ecosystem where the soils, landscape and vegetation exist under delicately balanced conditions. In the present situation this fragility gives rural production a very uncertain character, with distressing consequences for the socio-economic environment in other words, the level of production is currently determined chiefly by climatic events.

This situation is the result of two main factors:

- Insufficient knowledge about resources, and
- Inadaptability and inadequacy of techniques affecting production.

1.1.1 Insufficient Knowledge of Resources

This constraint causes a rigid utilization of resources which is neither managed nor controlled. It reveals itself in the over-utilization of fragile resources, ultimately resulting in their deterioration and therefore increasing the constraints on development. It affects all of the rural sub-sectors except irrigated farming where conditions are controlled.

1.1.2 Inadaptability and Inadequacy of Techniques Affecting Production

Though they reveal some forms of adaptability to local physical conditions and a certain rationality, most of the techniques in use are ill-adapted to the development needs of the rural sector and its realities. Other methods, however, although having undergone no modification since their conception, have reached the point that, at present, they actually have a substantial impact on production. Agricultural research in Mauritania, as well as in neighboring countries or in those with similar conditions, have confirmed this advance.

This progress, however, has not attracted any special attention, nor has it been publicized or applied In this vein, a well-known example among many others can be cited, that of the results recorded by IRAT in Kaedi on traditional farming: "A simple improvement and organization of traditional farming techniques, in very broad terms, can double yields without any investment." (1) This observation applies to millet, sorghum and niebe (cowpeas). By fertilizing lightly (100 kg/ha), in addition to using improved methods, IRAT quadrupled its output in the Senegal River middle valley.(2) Granted that these results were obtained at an experimental station, this experience demonstrates that at least 50% more than usual results can be obtained.

The majority of rural activities operate at far from an optimum level, obliging labor to increase pressure on the environmental resources, a pressure which often generates a degradation of the surroundings and exacerbates conflicts of interest between different groups. The absence of integration between different productive activities aggravates this situation

In summary, this constraint will continue to persist as long as technology undergoes no appropriated modification. This should manifest itself in a broad dissemination of information on technical advances which would require a number of well-defined actions

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(1) Introduction a la Mauritanie: Centre de Recherche dans les Societes Mediterreanen - Centre d'etude d'Afrique Noire.

(2) CNRA - RAMS - 1979.

in agricultural research and extension and, implicitly, in training activities. This constraint is a burden on all productive sub-sectors of the rural sector, especially oasis and dryland agriculture.

1.2 Human Constraints

These constraints are linked to the human factor and its role in production, as well as the socio-economic political environment - - all of which determine the human factor's potential for action. The present situation of the rural sector is characterized principally by the following:

1.2.1 The diversity of the human element, which is organized in different social fashions to exploit the environment. The social organizations reflect a certain adaptation to surrounding physical conditions, but they often determine the way natural resources and riches are distributed although they are not necessarily adapted to development needs. This gives rise to new problems which hinder the development process.

To be more specific a few examples are cited:

- The first example is that of the land tenure problem on large-scale irrigated plots (3) ; if this problem now affects production only to a limited extent because there are few large-scale farms, this will not hold true in the future when they will play a major role in achieving food self-sufficiency goals.

  The land tenure problem will therefore, be a definite impediment to the development of irrigated farming if no measures are taken in that respect.

- The second example is that of the "Habou" institutions (4) on the oases. This institution affects mainly those oases located close to urban areas, which are more open to change than the others which are remote and isolated. It is an obstacle to the introduction of new techniques.

(3) See RAMS study on Irrigated Agriculture ,1981.

(4) In the Mauritanian sense of the word: an inaccessible piece of collective property. See RAMS study on Oases Agriculture, 1980.

- The last example is the attitude of certain social classes towards labor and especially farm labor, creating working relationships between owner and cultivator which do not enhance progress.

On the question of social organizations, there are many other examples. Importantly, such organizations due to their adaptation to their surroundings, must be the starting point of any attempt to change a situation.

1.2.2 Dispersion of productive areas, which affects practicall all rural activities. This dispersion only accantuates the structural and support constraints which impede the development of the rural sector by impeding the systems of production. These constraints are revealed by the fact that government facilities have little favorable impact on production, on imputs, on the human factor, on marketing and on pricing.

1.2.2.1 The lack of influence on production is due to a lack of knowledge of the problems of production, which relate to research and to training. At present, there is a lack of integration between research and training with regard to the real problems of production.

For Production - At present, field training in areas of production is being handled by low-level agricultural and livestock agents whose training has not been sufficiently adapted to real needs. The principal tasks of these agents are, in theory, the extension of new or appropriate techniques. In reality, however, nothing occurs, especially as it affects agricultural production. This is due to several factors including:

- the quantitative ad qualitative insufficiency of these agents;
- insufficent knowledge of the environment, its possibilities and its systems of production;
- the lack of innovation and guidance to galvanize these agents;
- the deficiency of material and logistical means for taking action combined with the dispersion of areas of production.

Because of these factors, the efforts of the agents are spread thin and have very limited impact.

Therein lies an endless chain of problems that can only be broken by treating them globally and integrating all rural activities with the different problems of production.

For agricultural research: Agricultural research constitutes one of the most important links in the production process. It falls first to research to learn about the environment, to understand and analyze the functional and the spatial parameters of production systems; secondly, it is the responsibility of agricultural research to propose, based on results, whatever is technically possible and feasible in the present context, and to propose suitable innovations; lastly, it is up to the extension service to work on disseminating these findings. In the present stage of research in Mauritania (Cf. Table 2) there are many research programs characterized by:

- The disparity of their distribution amongst the different sub-sectors; for example, there are numerous programs for rice cultivation and irrigated fruit tree cultivation, while those involving traditional farming or animal husbandry are in short supply.

- The inadequate integration of most programs in dealing with the real problems of the rural sector is due to the fact that these programs have concentrated on only one aspect of a problem among many others. There are many examples of this:

  In Oasis agriculture, the only aspect deal with is biological control of pests; in animal husbandry, the only aspect is animal health, etc. This poor integration is also due to a lack of coordination at the programming level, for programming is executed independently by the different research institutions. For that reason one finds programs managed by OMVS, others by CNRADA and others by the Department of Agriculture, etc.

- The lack of follow-up in these programs; in fact, most of them are financed from outside sources (UNDP, WAEC, FAC) and directed by expatriate experts (FAO, OMVS,

Table 2a : Status of Agronomical Research: State Research Institutions and Centers/Stations in Mauritania.

Institution	Center/Station	Type of Program	Number of Researchers
CNRADA	Kaedi Center	Irrigated Crops	7
	Bellinabe station (Kaedi)	Market gardening other irrigated Crops	4
	Fruit Orchard Station of Rindiao (Kaedi)	Fruit Orchard	1
	Date Palm growing Station of Kankossa	Date Palm growing	Non-functional
	N'Gorel Station (Boghe	Experiment with Banana growing	1
CNRADA + Agriculture Division	Entomology Laboratory of Nouakchott	Biological control of the Date Palm	2
CNRADA + OMVS	Sylla Station (Kaedi)	Seed Selection	2
	Roufi Station (Kaedi)	Experimentation with Banana growing	1
CNERV	Annual Husbandry Laboratory of Nouakchott	Animal Health, Fodder production Sheep raising	

Source: CNRADA
CNERV
1980

Table 2b : Status of Agronomical Research: Breakdown of Research Programs and Researchers by Principal Production Activity

Activity	Number of Programs	Researchers		Observations
		Nationals	Expatriates	
Cereal Cul. Irri.	5	3	1	
Forestry	7	2	1	
Market gardening	9	3	2	
Food Crops	2	2	2	
Animal Husbandry	2	1	3	
Total	25	11	12	

Source : CNRADA
CNERV- 1980

* By food Crops, it is meant only legumes and traditional vegetables.

etc.), which inevitably brings about their demise once the financing runs out. This goes back to the fact that research is not structured effectively and requires complete structural overhaul. Added to this is the insufficient number of national experts, resulting in a lack of planning in the area of training for development.

- Over-centralization of the research infrastructures from the standpoint of their geographical distribution. The majority, if not all of the centers and stations are concentrated in the River region and even more so in the Gorgol. This looks normal if one recognizes the economic importance of the region, but it must be acknowledged that rural production goes on in all of the agro-ecological zones.

- A total lack of research programs for rural development and regarding the economics of development, which is peculiar given the socio-economic importance of the rural sector and the necessity of sustained and integrated development.

1.2.2.2 Technical innovations exert but little influence on rural people. The transfer of knowledge and information imply supervision and extension services, which are nearly non-existent. The fact is that in the present situation, knowledge and information are far from being furnished as they should be, and infrastructural constraints only aggravate this situation.

To be more concrete, it is noted that right now, the supervision and extension services have only (1):

- 118 agents in agriculture

- 161 in animal husbandry,

on all levels, both central and regional supervisory and field based. These numbers correspond to the following ratios for all of Mauritania:

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1) RAMS' study Employment Skills, 1981.

- 1 agricultural agent for 784 sedentary and nomadic farmers
- 1 animal husbandry agent for 707 sedentary and nomadic livestock raisers.

These ratios already reveal a quantitative shortage which is even more pronounce because of the dispersion of the productive zones and therefore of the populations concerned. Considering the sedentary population alone, it is spread out among 2,300 villages, which, by comparing the number of agents to the number of villages, would yield:

- 1 agricultural agent for about 20 villages
- 1 animal husbandry agent for about 15 villages, not counting the nomadic populations.

This makes it impossible to carry out supervisory and extension tasks, especially with the material means now available.

1.2.2.3 The Lack of Influence on Marketing and Price Fixing is apparent in the fact that the state's role in marketing and price fixing is crippled by infrastructural constraints and by the scattering of the production zones, despite the existence of certain regulatory institutions, especially for cereals, such as the Mauritanian Cereals Office (OMC Office Mauritanien des Cereales). This problem is generally combined with production which is too irregular or insufficient to justify large-scale actions.

The result of all this is that the state has extreme difficulty in stepping in and that the producers are dominated by well-informed merchants, transporters and traders; the ultimate consequence of this domination is a low valorization of production at the producer's end. This shows up in the margin between the prices paid to the producers and those paid by the consumers. A few examples follow (Cf. Table 3).

A glance at this table, which gives only a general idea of the situation, shows that margins are often quite wide, which may be explained chiefly by the powerlessness of the producers and by relatively high transportation costs.

Table 3 : Comparison Between Producer and Consumer Prices for Certain Products Rural Sector

Products	Producer Price	Consumer Price		Margin between Producer and Consumer Price in Nouakchott %
		Nouakchott (2)	Interior	
Agricultural Products				
Millet, Sorghum	14.5	30-35	18-21	106-141
"Bleh" Dates	30.5	90-200 (3)	-	195-555
Ripe Dates	37	80-100	-	116-170
Livestock Products				
- Bull	10,000	14,260	-	40-160
- Bull-calf	7,000	12,200	-	71-185
- Ram	2,200	2,500	-	127
- Sheep	1,200	15,400	-	25-233
- Adult camel	20,000	17,300	-	50
Camel (medium size)	10,000	12,250	-	20-150
Ocean Fish	18 (4)		35-40 (Boghe) 45-50 (Kaedi)	94-177

Nouakchott market and slaughterhouse prices between Dec. 1980 and Feb. 1981
Nouakchott market prices during the guetna paeriod.
Based on the RAMS artisanal maritime fishery study, 1981.

1.2.3 Agricultural Pricing Policy

Agricultural pricing policy is the tool of a country's overall food policy. A pricing policy allows:

- the state to control the markets in order to assure supplies to the cities and to areas of under-production; to regulate prices to consumers.

- to encourage an increase in food production, the only way of attaining food self-sufficiency in the long term.

The policy which has succeeded in regulating prices through subsidies has kept consumer prices down but has not been able to encourage production.

Although Mauritania may succeed in maintaining food supplies thanks to an import program and donations from foreign governments and organizations, assuring food supplies in the medium to long range necessarily involves increasing grain production. The commendable desire to help the under- priviledged through cheap (or free) grain should not end up sacrificing long term development.

At present the situation involving locally-produced grains is as follows:

The grain is bought by merchants who store it and sell it later on at high prices during periods of scarcity. These merchants play the role of collectors and distributers. Furthermore, the Mauritanian Grain Office (OMC) has been able to collect only 10 to 20% of local millet and sorghum production. The OMC's mobile and stationary collection teams are in charge of acquiring grain stocks as are the OMC's 17 local branches. There is price competition between the OMC purchases and the merchant-haulers in certain regions like Gorgol and Guidimaka.

OMC Grain Purchases from Farmers (UM/kg)

Price Year	Millet /Sorghum			Paddy
	Floor	Ceiling	Average	fixed
76-77	7	11	7.8	10
78-79	7/8	12	8.2	10
80-81	10/11	13		

The price paid for millet and sorghum are near the lower level. Depending on the region, prices sometimes go above the ceiling fixed by the OMC (especially areas around Nouakchott). In others, they are below the floor set by the OMC. The OMC's role in price stabilization is therefore not very effective because of its own inadequate resources. The improvement of its collection mechanism should enable it to reach a larger number of producers and thus a greater percentage of the grain produced; this will allow it to improve its role in stabilizing the grain market.

However, in the case of grain imported by SONIMEX, the prices charged to consumers are subsidized and the stabilizing effect is particularly noticeable (see the list of prices in Rural Sector Consumption Patterns - RAMS, 1980, p.119). The grain contributed by the international assistance programs is distributed free to the needy by the CAA (Food Assistance Commission) - (Commissariat a l'aide alimentaire). The free grain amounts to 1/5 to 1/3 of the foreign donations and the rest is sold to needy people at prices ranging from 8 to 10 UM/kg to cover shipping and handling costs incurred by the CAA.

Remarks

Several observations can be made about the marketing system and the agricultural pricing policy:

- Traditional grains fetch profitable prices (millet, sorghum); this valorization depends upon the ability

of merchants to collect it and transport it and there are therefore unequal profits from one region to another. Some regions such as the Hodhs are at a disadvantage because of the lack of transportation.

- Because of the high cost of the traditional grains, food habits have shifted towards a greater consumption of rice.

- The availability of subsidized (imported) grain and grain sold at profitable prices (donated grain) have important social benefits but many disadvantages as well:

  - These grains are an easy way of supplying urban areas and discourage the development of national productive capacity.

  - They tend to lower the prices of grains which serve as signals to producers.

  - They constitute a negative incentive for the government to encourage production.

  - Finally, the sale of rice at subsidized prices tends to put rice producers into a difficult situation. In effect, the price of 10 UM/kg for paddy is charged by SONADER alone, which is concerned with being repaid to cost of inputs given and lent to the peasants. In most cases, the producers are paid less than 10 UM/kg.

Suggestions:

The sale of cereals at subsidized prices is possible and desirable only in the short term and as a temporary measure. According to the RAMS studies, (1) Mauritania will have a chronic grain deficit that will grow each year through the year 2000 if nothing is done to change the situation.

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(1) Rural Production, RAMS, 1981.

The solution to this problem is a long-term increase in grain production. In order to achieve this goal, the interests of producers as well as those of consumers will have to be considered. In order to solve the difficulties involved, the para-statal organizations involved will have to

- improve storage facilities in order to give farmers a certain grain supply at affordable prices during the late dry season and to encourage them to sell their crops.

- gradually raise the average price paid to the producer by guaranteeing a minimum price. In order to do this, the following steps will have to be taken:

  1) Reduction of the difference between the subsidized price paid by consumers and the price to the farmer. This could be done by comparing the prices of imported grains plus the cost of handling and shipping involved in getting the grain delivered in the interior of the country with the cost of producing grains locally (see Table A comparing costs in the case of rice). In this case, the basic cost of 23,206 UM/t or 25,206 UM/t must be used to calculate the price paid to producers, depending on whether the subsidy of imported rice is included or not. The price paid to producers for paddy would then have to be between 13.8 and 15 UM/kg depending on whether transportation were subsidized or not.

  2) The average cost to producers can also be calculated based on the minimum wage paid to agricultural workers.

     The number of working days necessary to produce a kilogram of rice can be calculated and the applicable wage level can be used to determine the cost to producers.

  3) The price of grain sent as food aid can be brought closer to market prices. In order to solve the problem of the needy (20% of the aid received) who do not have enough income to purchase their grains, a food coupon system could be used. The needy could use the food coupons to buy grain sold at market prices (income subsidy program).

The income from the sale of donated foods could finance either agricultural inputs or an increase in the budget of the marketing organizations allowing them to increase the scope of their activities and to maintain a guaranteed minimum price. (1)

Given the right producer's prices as an incentive, assured grain supplies at reasonable prices and donated foods at near-market prices, the peasants should be encouraged to produce more and to use more modern inputs to raise productivity.

Table A

Costs of Importing Compared to Costs of Processing Domestic Rice

Costs of Importing Rice

(UM/mt except for CAF Prices)

Price CAF ($)	325	400
UM Equivalent	14,625	18,000
Buying expenses	292	626
Wharfage and transit	1,500	1,500
Sub-total	16,417	20,146
General Expense	2,683	3,292
Taxes	493	604
Margin	294	352
Storage	320	320
Cost to Nouakchott:	20,206	24,714
Transport to the Interior:	3,000 (1)	3,000 (1)
Cost Interior	23,206 (1)	27,714 (1)
	(25,206) (2)	(29,714) (2)

1) Subsidized transport cost. Actual cost 5 UM/kg.

2) Unsubsidized cost averaging 5 UM/kg.

1) Collection of grain should accompany production inputs. It would allow for a reduction in the cost of transportation.

(Table A continuation)

Cost of Processing Domestic Rice UM/mt

Producer Price of Paddy	11,000
Transport and handling	2,000
Sacks and Labor	500
Milling (paddy)	1,800
	500
	15,800
Conversion	0.60
Rice equivalent/ton	24,500
Less price of by-products	-1,800
	22,700
Transport to Nouakchott	3,000 1)
	25,700
Cost Delivered	(27,700) 2)

1) At subsidized cost. Actual costs 5 UM/kg

2) Un-subsidized cost of 5 UM/kg.

Given the need for sustained development and of rural sector growth, which is of tremendous socio-economic importance, the problem of inadequate rural development structures is one of the greatest constraints.

At present, the rural development structures are in such a state that they are incapable of allowing such ambitions to be realized, ambitions which, objectively speaking are not impossible to attain. These structures are in principle:

- The Ministry of Rural Development
- SONADER

- The public institutions serving Rural Development, which

  are: CNRADA, CNERV and ENFVA. One should also add the OMC, which was once attached to Rural Development and is now attached to the CAA, which is now a part of the Presidency. They are characterized by:

Marked independence from one another in practically every respect: financially, technically and administratively. Even though in theory the Ministry of Rural Development controls all the other public institutions, in reality such is not the case at all. This goes back to the fact that the existing structures of the MDR (1) are inhibited by the small size of its supervisory staff and the scantiness of financial resources; geographical constraints (spatial dispersion) all add to this weakness. In fact, with regard to personnel, the MDR presently disposes of only (1):

- 30 top level
- 54 middle-level
- 240 operating level cadres

to execute the various roles connected with its functions, dealing in general with the planning, programming and control, administration and supervision of the activities concerning rural populations. Considering the amount of natural resources in the Mauritanian environment, the country's technical resources potential and the dispersion of the population, this supervisory staff size is clearly very small, even insignificant (Cf. Chapter 1.2.2.2.). This judgment does not result from comparisons made between supervisory-personnel standards in other countries which would not make sense in a Mauritania context, but from comparing current supervisory personnel ability with the immensity of the rural area and its human geography combined with the inadequacy of road infrastructures and of means of interventio

(1) Based on the Draft report by the Sectoral Planning Commission for the Rural Sector, October 1980.

With regard to financial resources, this scantiness is revealed in the fact that the operating budget of the MDR is very restricted, representing no more than 27% of the state operating budget on the average. A priori, this may seem normal, given the reduced number of personnel. The operating budget is normally comprised of two main columns which are:

- Personnel expenses which are invariable
- Equipment expenses which vary.

So, in the MDR's case, personnel expenses make up most of the operating budget: they represented an average 75% of the total budget in the past ten years, which left only 25% for the equipment column. Such structure for the operating budget only serves to hinder the efficiency of an already extremely weak staff. The result of all these weaknesses is a weakening of the bonds which should exist between the MDR and the other structures or institutions which in theory serve rural development.

1.2.3.3 The Absence of Horizontal Integration Between the Different Rural Development Structures is deplorable, especially in the present Mauritanian context, where human and financial resources for development are quite limited. This is seen in the fact that no joint effort whatsoever has been developed between any two or several institutions to attack a problem at either the central or the regional level, so that there are often overt incompatibilities among programs. For that reason, horizontal integration must be sought in order to save on efforts and improve the operational efficiency of these structures.

1.2.3.3.3 The Lack of Vertical Integration of These Structures, i.e., the lack of a high-level office for rural development planning. Indeed, right now planning responsibilities are spread out between the MDR and the other institutions to such an extent there is rarely a coherent global plan combining choices compatible with development goals. This inadequacy is even more striking than the fact that available financial resources are limited.

The creation of a high-level planning unit would allow a coherent approach with appropriate choices to be made by going

through a preliminary stage in which the different programs, proposals and sub-sectoral projects could be assessed.

The Imbalances in the Apportionment of Credit Between the central services and the regional services of the MDR, proof of a certain centralization in the administration of the rural sector. Indeed, credits are distributed at an average of 60% maximum for the central services and 40% for the regional services.(1) Such an apportionment is not compatible with the real needs of the rural sector.

1.2.3.3.4. Insufficiency of State Input for the Rural Sector.

This insufficiency is directly related to the scantiness of the entire MDR budget, and indirectly related to the amount of funds allocated to training, research and extension and to the supportive measures in the rural sector. As an illustration it may be noted that the credits allocated to training, research and extension were as follows for 1980:

- Training (ENFVA)	21 million UM
- Research	
. CNRADA	5 million UM
. CNERV	10 " "
- Extension (2)	54 " "

or a total of 90 million UM. This amount corresponds to about 1.3% of the sector's GNP during the same year. If this rate seems satisfactory in a relative advanced economy, it appears to be low in the Mauritanian context. In reality, these allocations are usually supplemented by foreign donors with loans/grants projects or technical assistance, but being poorly organized, such assistance has only very limited impact on the rural sector, which further substantiates the inefficiency of existing structures of rural development.

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(1) FAO, 1978.

(2) This sum approximately matches that part of the Ministry of Rural Development earmarked for regional activities (40%). It has been assumed that the entire amount is allocated to extension services.

Chapter 2 Selection of an Institutional Framework for Rural Sector

Examination of the present framework of rural production has revealed two major groups of constraints, which are:

- The technical constraints related to the environment and its potentials and to production techniques;
- The human constraints related to the how people and their socio-economic conditions interact with one another.

These two groups of constraints are organically linked in much the same way as the relation among for example, a tent, the space under the tent and the human element, which, benefits from the shade of the tent by occupying the shaded area.

It seems rather evident therefore, that the human constraints are the most limiting and deserve to be examined and solved first, if only by virtue of the fact that the human factor is the raison d'etre of all development. However, in examining the human constraints closely one sees that there are several subsets of constraints which are linked to:

- the diversity of the human factor;
- the spatial scattering of the production zones and the insufficiency of the infrastructure;
- the inadaptation of rural development structures to need;
- the insufficiency of government inputs in the rural sector.

These subsets are linked together in such a way that, by drawing an analogy, one could compare them to a cloth which must be used to make a tent and in which :

- the infrastructures would represent the cloth;
- the rural development structures would represent its different threads;

- the scattering would represent the different colors;

- inputs from the government would represent the reinforcing synthetic material.

Hence, by drawing an analogy in the present situation, one could assert that right now, the cloth is very limp, revealing a rather loose, coarse and irregular weave and motley, ill-patterned colors.

With such a cloth, a tent would be no protection from intemperate weather and a man would not care whether he remained in the tent or looked for shelter elsewhere; in other words, under present conditions, with a few exceptions, the rural people would be indifferent as to whether they lived in the countryside or left it for urban areas.

So, in order to improve this situation and protect and stabilize this human factor, it would be indispensable above all to improve the threadcare nature of the tent cloth and its durability, but also to place the tent in a good spot. To that end, there are several possibilities:

- increase the number of supports to the maximum and reinforce them ;

- increase the number of threads to the maximum and reinforce or change them;

- combine the two, reinforcing them or not;

- soak the cloth in a synthetic substance, etc.

The color would change automatically and would be less motley-looking.

Other variations of these alternatives could be considered according to whether or not the human element takes part in making this tent.

The problem now remains to arrange the space within the tent, which in principle depends mainly on its shape. There are several possibilities: Either the shape is imposed upon the human

element, which could have frustrating consequences, or creating a shape is left to the initiative of the human element or, lastly, th the shape of the existing tent is improved and adapted.

Choosing one or another of the possibilities and alternatives would of course depend on the objectives of that undertaking, the availability and costs of raw materials, the nature of the work to be done and the time required, on the extent to which the human factor would participate in the work and upon the tent shape choosen.

Returning to the study, one sees that this analogy, although imperfect and limited in scope, has allowed some assessment to be made of the constraints and problems in today's institutional framework. It appears that the most determining factors to consider as means of improving the situation are:

- the structures of rural development;
- the problem with the infrastructures;
- the degree of support in the rural sector;
- the degree of participation by the rural populations.

Selecting an institutional framework would require weighing these factors in light of the objectives to be reached of the time given to reach these objectives, and finally, of the human and financial resources available. However, given the present situation, where none of these factors is very available and all constraints have nearly the same impact, there can only be a limited selection.

In the light of this situation and with a concern to simplify the selection, only three possible choices or options have been introduced. These options have more than one point in common but differ in their respective approaches or in the resources required for their implementation. The ideas discussed here are taken from or inspired by existing concepts adapted to needs.

- The first option (Option A) is oriented towards a global, systematic development. This approach strongly emphasizes vertical integration of rural development structures as well as governmental involvement in

order to achieve maximum potential. This option should complement the most optimistic production strategies and it presupposes large amounts of human and financial resources and an unflaging will.

- The second option (Option B) is oriented towards integrated, regional development favoring localized community development activities. This stresses adapting the various institutions implied in integrated development to new needs by vertical and horizontal integration at a various level. The option should answer the needs of the most realistic production goals, considering the relatively moderate amount of efforts it requires and the very complicated nature of the physical and human environment.

- The third option (Option C) consists of projecting current orientations, with all their advantages and shortcomings (Cf. Ch. 1). This last option is of interest chiefly because it allows an evaluation to be made of the first two options and eventually of any other intermediate option.

For each option, the following points will be discussed:

general outline

objective

main components or means of action

an assessment of the option

This report will terminate with a short comparative analysis of the possibilities and limitations of the different options, with emphasis on the training problem.

2.1 Option A

2.1.0 General Outline

This option is oriented towards accelerated and systematic development of the rural sector, calling for a sustained pace of development of all physical human resources. It proposes a reorganization of the present institutional framework and the reinforcement of the public sector's ability to take positive action. It supposes that top priority will be granted to the rural sector and calls for the consolidation of the supervisory and productive structures, and greater participation of the local population. Its implementation requires very strong political will.

This option is justified by:

- the failings of the present system of rural production, which is stagnating or deteriorating, even though system concerns a growing majority of an ever-increasing population;
- the impoverishment of the rural sector and the ever widening gap between the other sectors;
- the necessity to take command of the rural sector in order to attain the development objectives within a given time.

2.1.1 Objectives

This option should go hand in hand with the most optimistic sectoral production goals in order to reach these goals within a given time frame. This is to be done by laying the foundations of institutions required in the development process and by accelerating the process itself while taking into account:

- conservation and regeneration of the environment;
- equilibrium of inter-sectoral and intra-sectoral development

The different options and their objectives can in turns be summarized as follows:

2.1.1. Irrigated farming and Dryland farming: To attain food self-sufficiency by the year 2000.

This option assumes a pace of sustained and accelerated development of irrigated fields and the use of an improved technique in traditional farming. It should permit 307,000 tons of cereals to be produced, covering 97 to 98% of the food demand. This level of production could be achieved through very different methods according to the form of technology adopted and the available manpower for farmwork. So, two extreme alternatives have been considered:

The first presupposes the cultivation of:

- 68,811 ha. of irrigated and mechanized rice fields, with double cropping in over 55% of the area, thereby mobilizing 14,787 workers and requiring 1,445 tractors;
- 17,610 ha. of improved dieri crops in the Senegal River valley, mobilizing 11,439 workers;
- 81,931 ha. of improved rainfed farmland in the southeast, mobilizing 59,374 workers;
- 21,000 ha. of improved recession fields in wadis mobilizing 27,122 workers.

This possibility guarantees the full employment of the available active population as farm labor in the different agro-ecologial zones: the number for these workers was determined on the basis of an annual growth rate of the active employed rural population in 1980 of about 2.5%, corresponding to the overall rate of population growth.

The second possibly supposes the farming of:

- 68.811 ha. of traditionally cultivated irrigated rice fields; animal traction with double cropping over 50% of the area, mobilizing 34,435 workers;
- 40,406 ha. of improved dieri farm land, mobilizing 59,374 workers;
- 81,931 ha. of improved rainfed farmland, mobilizing 59,374 workers;
- 21,000 ha. of improved recession fields, mobilizing 27,122 workers.

This alternative would provide employment for 147,353 workers but of which only 112,718 or 76% are available in the production zones, resulting in over-employment, which affects the Senegal River zone. This over-employment is inevitable if this option is chosen and it presists even if dieri cropping along the river is illiminated. Hence, implementing this option would necessitate the the mobilization of a certain quantity of manpower to be settled on the irrigated fields in the Senegal River valley; under the best conditions, this manpower would represent a minimum of 11,000 workers out of a population of approximately 37,400 persons.

2.1.1.2 The Oases sub-sector: Mobilization of Existing Potentials

This would entail developing two types of potentials:

- the first consists of rationalizing the use of existing resources while protecting them against deterioration;
- the second consists of creating new oases (about 500 ha) through the tapping of the largest underground water tables These oases would be located on new lands and would require new settlements.

The implementation of these possibilities should allow the production of the following in the year 2000:

38,000 tons of dates

3,750 tons of vegetables

11,000 tons of fodder

600 tons of cereals

250 tons of henna

and in theory, the employment of 6,000 workers full time. In reality, it should mobilize between 20,000 and, 31,000 workers, but full-time and part-time. (1)

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(1) Oasis Agriculture, RAMS 1981

2.1.1.3 Livestock sub-sector: to augment the stock

This program assumes that there are programs for pastoral development and that emphasis is placed on research, credit and supervision and training, so that by the year 2000, the livestock population will have doubled compared to original herd size of 1980; the total number of TCE UBT's (Unite de Betail Tropicale - Tropical Livestock Unit) is 2.2 to 4.5 million.

2.1.1.4 The Fishery Sub-sector - Major Development of Fishing Industry.

This option supposes the constitution of a national industrial fishing fleet and the installation of the required infrastructures. It should theoretically permit the production of 200,000 tons of fish and create a total of 2,825 jobs between 1985 and the year 2000, of which 595 will be employed at sea (fishermen) and 2,260 on land.

As concerns artisanal, inland and marine fishing, this option envisions the continuation of current trends (Cf. Ch. 2.3.1.4, Option C).

2.1.1.5 Compared to the current production levels in the rural sector, the objectives described above suppose considerable additional production, notably in agriculture. In fact, as an example, it must be noted that:

- cereal production (rice, millet, sorghum) must rise from approximately 60,000 tons in 1980 to 307,000 tons in the year 2000, which requires a mean annual growth of about 20% during the period mentioned.

- date production must rise from 2.2 to 4.5 million tons, which represents a mean annual growth rate of 6.5% between 1980 and 2000.

- livestock must rise from 2.2 to 4.5 million UBT's, which represents mean annual growth rate of about 5% between 1980 and the year 2000.

- industrial fishing production must grow at a rate of 15% per year in order to attain 200,000 tons in the year 2000.

Achieving such levels of performance would necessitate giant efforts in the area of technial progress, especially since the technologies adopted by these options are either new or greatly improved and consequently create a new demands in knowhow, production inputs, etc.

The level of these efforts and needs would depend on the extent of the additional production expected of each sub-sector.

2.1.2 Main Components of the Option

Two main components have been taken into consideration and emphasized. They are: the rural development structures and inputs from the government.

2.1.2.2 Reorganization and Reinforcement of the Rural Sector Administration:

This component calls for a set of priority actions which are closely linked to one another, so that in order to be operational, they should be implemented on a relatively tight schedule. These actions are:

2.2.2.1.1 The integration of the different structures and institutions involved with the administrative aspect of rural development in order to eliminate compartmentalization, economize on efforts and increase operational efficiency. This integration should take place on several levels:

(i) In planning for the entire rural sector, which should be able to be carried out by setting up an evaluation and planning structure (bureau direction, department . . .) for the rural sector. This structure would be an organ of consultation, coordination, and economic assessment for agricultural projects and planning for all of the productive sub-sectors. It should be equipped with a statistics unit and be spearheaded by a highly competent, multi-disciplinary team.

Its primary responsibilities would be:

- The centralization of all information on the rural sector, such as activity reports on subsidiary organizations or evaluation reports on the agricultural campaigns, projects, etc.

- The compilation of agricultural statistics, their analysis and distribution.

- Define the rural development policy by:

  . setting up selection criteria for the principal project types and suggesting useful promotion measures.

  . determining the priorities within the rural sector.

  . channelling any requests for outside financing for the rural sector and participating in negotiations.

- programming and allocating the MDR operating and equipment budgets as well as resources from outside of the budget.

- handling the control and follow-up of that programming.

- Preparation of the final documents of the rural sector plan.

- Acting as sponsor for the public and para-statal agencies.

Moreover, this structure should have both vertical and horizontal relations with the other MDR divisions and handle the liaison and coordination between the MDR and the Central Planning and Statistics Division in the Ministry of Economy and Finance.

(ii) In research, extension and personnel training for development. It should be possible to achieve this integration by establishing a division of research, extension and personnel training for rural development

This agency should:

- Devise, with the collaboration of the other MDR departments and through a national committee or council of research, extension and training,

  - Research programs on the main problems revealed through field extension work related to the different production systems.

  - Training programs at all levels in compliance with development needs.

- Evaluate these programs and supervise their execution by the specialized institute (CNRADA, CNERV, ENFVA ...), which would be placed under its supervision.

There is an obvious need to reinforce these institutions by creating new divisions and gradually replacing expatriate researchers with nationals. The creation of divisions chiefly concerns the CNRADA which merits being equipped with:

- a research division on agricultural engineering, which would attack the problems of hydraulics, water and soil conservation.

- a rural economy division which would concentrate on the problem of production systems in rural areas and be responsible for:

- formulating themes based on research results which can be popularized and diffused by means of the MDR offices and handling their evaluation.

- dynamizing international relations and exchanges in the fields of research and training;

- providing a service for continuous training and refresher courses.

In addition, this division should handle the coordination of rural sector training programs with elementary, secondary and university educational programs and eventually initiate some form of research cooperation with the Mauritanian Institute of Scientific Research (IMRS).

(iii) In the area of data collection and management of natural resources, this integration calls for the establishment of an inventory office for natural resources, which are:

- hydraulic resources

- soil resources

- sylvo-pastoral resources.

This bureau should be in charge of drawing up an exhausive inventory of natural resources by:

- Keeping knowledge up to date about resources and how they are used

- programming inventory studies to be conducted (by it or by a sub-contractor);

- centralizing this information and making it available to users.

- determining each resource's potentials and the maximum limits of its use.

(iv) In regulating the use and distribution of natural resources in the rural areas; this integration requires the establishment of a head law-making body or even better, of rural institutions.

The role of this body would be:

- To perfect an outline for rural legislation, notably pastoral in the area of land use rights for farmlands, grazing lands, forests, and pastoral water points. Any attempts to approach this problem should be consonant with the rural reality and its rationale. This task should be executed in collaboration with the other MDR divisions.

- To prepare and execute land tenure improvements on future hydro-agricultural development projects.

- To totally eliminate habous on the urban oases.

- To design and institute appropropriate formulae for tenant farming with an aim to encourage farm labor, especially in the oases.

(v) At the administrative, programming, supervisory, and production follow-up level. This integration should be made by grouping already existing divisions under a single rural production division divided into 5 administrative units, which would be:

- A common unit, which would be in charge of field extension work. This unit should maintain permanent contact with the other 4 units and work very closely with the research, extension, and personnel training offices as well as with the regional sectors. It should:

  - Manage field extension work;

- eventually evaluate field work;

- develop a typology of problems and submit a description of them to the research, extension and training divisions;

- select and devise the proper medium for disseminating the topics to be popularized;

- provide support for field extension work by leading audio-visual consciousness-raising campaigns by means of a mobile team.

This service should also be instrumental in selecting and evaluating extension agents and in directing a program for on-going training of these agents, which should be organized by the research division.

The common unit would supervise:

- A vegetable production subdivision,

- An animal production subdivision,

- An environmental protection subdivision, and

- An agricultural engineering and agricultural hydraulics subdivision.

The main duties of these subdivisions would be to:

- design separate national sub-sectoral development programs based on the regional programs, which would be checked for compatibility. Then, once the programs were approved by the rural development planning agency,

- handle the technical supervision and follow-up related to the implementation of these respective programs

while making sure that the yearly campaigns are run smoothly. Carrying out such tasks requires the participation of the extension service and help from para-statal agencies such as SONADER, the OMC and the CREDIT INSTITUTION, etc.;

- make sure that regulations governing the use of rural resources (water, soil, rangelands, forests, etc.) are respected, with each subdivision being responsible for its field, of course. In that regard, some cooperation should exist between the different units to insure harmonious and effective execution of such tasks. For example, measures adopted by one unit must not contradict those of another unit.

Moreover, these units should have a certain number of sub-units (services or divisions) which would correspond to the main sub-sectoral activities. Hence, the vegetable production sub-division would have 5 sub-units handling:

- traditional and irrigated food crops
- fruit tree cultivation, including date palms and other fruit trees.
- market gardening
- fodder crops
- crop protection

The animal production sub-department would include 3 units concerned with:

pasture use (grazing lands management) and overall assessment of animal food sources.

animal production and breeding

animal health

The rural public works and agricultural hydraulics sub-department would be made up of 5 sub-units concerned with:

- dams for recessional agriculture
- agricultural mechanization
- irrigation, drainage and land improvement
- research and new projects
- rural hydraulics and agro-meteorology.

The environmental protection sub-department should have 4 sub-units:

- classified forest and gum tree groves
- water and soil conservation
- wildlife and protection
- research and new projects.

(vi) On the regional level: the integration process should be based upon reinforcing the various regional rural development networks (agricultural sector officer, livestock inspection offices etc. . .) according to the potential of each agro-ecological zone or region. Such a regrouping should lead to the creation of a department, or regional commission for rural development which would be adequately staffed in order to reflect the relative economic importance of the various rural activities in the region. The responsibilities of these regional units would be essentially the same as those of the central headquarters of the rural production department but adapted to regional needs.

(vii) At the local level or field level, the multiplication and generalization of the Rural Outreach Centers (CER) in the productive zones. These CER's would represent the basic development units, which would be placed in the villages or communities. They should be responsible for channelling governmental inputs and policies in the form of selected themes. These centers should be directed by two to three categories of agents:

The first kind, an extension agent (monitor) would be a permanently-based agent who could be provided by the MDR or detached from the MRD and paid by the community or local organization, depending on the nature of activities to be carried out.

This category of agent would be supervised by middle-ranking personnel (assistant engineer), 1 for every 5 agents, who in turn would be supervised by extension engineers on a basis of 1 for every 4 assistant engineers.

The second type, a liaison and service agent (conducteur de travaux) could be mobile and would handle relations between the producers and credit institutions and with the MDR agencies in the region. He would work for the MDR and would serve more than one center. This category of agent would be supervised by high-ranking personnel (agro-economists) on a basis of 1 to 10 agents.

The third type is a livestock agent (veterinary-assistant moniteur) who would be assigned to a group of villages and therefore to CER's around one or several pastoral water points. He should be supplied with the necessary means of action. His main duties would be:

- to handle the annual vaccination drive;
- to monitor animal health, and the use of trek routes and water points
- to separate sick herds and request action en massee.

These livestock agents would be supervised by livestock assistants at a rate of 1 to 5 agents, who would be supervised by veterinarians at a rate of 1 veterinarian to 5 assistants. Furthermore, the CER's should be capable of handling the flow of information from the bottom up by keeping a regular log of activities and recorded

results of that an effective evaluation of the rural sector may be made and a satisfactory development policy formulated.

(viii) At the para-statal agency level- this includes SONADER, SONICOB and the OMC, who should have major roles as they are necessary elements in reaching development goals.

- SONADER, whose structures have significant potentials is worthy or being localized solely in the area of hydro-agricultural development in the river valley, given the far-reaching importance that irrigation will have in that zone. SONADER should be strengthened so that development projects may be achieved within the designated time. For that reason, it would be necessary to set up teams to develop the irrigated land plots in order to meet demand. SONADER would also be called upon to work closer with the MDR structures, especially in the area of land development and in the organization of production structures.

  As for hydro-agricultural development projects involving tapping underground aquifers, it would seem more rational to delegate that responsibility to the subdivision of Rural Engineering and Agricultural Hydraulics.

- SONICOB, which appears to be barely surviving, needs to be rehabilitated, if only gradually. In a preliminary phase, limited actions such as collecting fattening animals for slaughter and distributing food or other useful action during period of scarcity would be possible by creating low-cost "waiting stations" (poste d'attente) which would be placed on transhumant trek routes. To achieve this, the program would have to offer encouraging conditions for the herders such as lucrative prices, bartering possibilities or other supplementary services.

- As for the OMC, which is currently under the Presidency and headed by the CAA, it would have to be integrated into the MDR, in light of its responsibilities and of their connection with cereal production. Also, considering the types of this production and its relatively low volume, the OMC can only have a minimal role.

In reality, since its creation, its role has been limited chiefly to food aid distribution, which is a very passive role for an institution serving development. Hence, in order to prepare the OMC to play its role to the hilt, it is necessary to get it more directly involved in the overall development progress, if only in the medium term and while awaiting a consolidation of the production structures.

Its involvement could be made possible by assigning it, in addition to the part it ought to play after production which is now quite limited, a complementary role prior to production. This new role would consist of channelling production inputs into the main centers; constraints on its means of intervention could be bypassed by going through institutionalized credit (PND) or through other special funds.

The effectivenss of the OMC as a development institution could thus be increased and made to benefit the development process of the rural sector.

2.1.2.2 Establishment of Promotion Measures and Supportive Measures

2.2.1 Objectives: This component has 2 main objectives:

* The 1st is giving impetus to the subsidiary agencies in such a way that they are more directly involved in the development process.

* The 2nd is the consolidation of the structures of production via measures designed to induce the producers to become better organized.

The types of organization should be suited to local realities and to the types of production encountered. The following types of organizations are proposed as examples:

- Cooperative Production Units - for the small irrigated plots. Several units could later merge together to form a cooperative union, an agro-industrial complex or a regional mission, etc.

- Farming Combines for the large irrigated fields, which should later evolve into an agro-industrial complex .

These two types of organization demand a relatively advanced vertical integration of their various component activities.

- Common Interest Associations for plots of land created in the interior near wells or for new oases. The focus of interest for this type would essentially be making the joint investments in the area of mobilizing water resources and irrigation. This type of organization could also be adapted in the case of recession dams, where the common interest would lie in the construction and maintenance of the dams.

- Farm Service Cooperatives or agro-pastoral service cooperatives, etc.

2.1.2.2.2 Promotion Measures. We have made distinctions between 3 groups of joint measures:

- Assistance measures such as loans and subsidies.

- Incentives, such as appropriate price policy.

- Protective measures.

2.1.2.2.3.1 Subsidies and Loans : This set of measures requires the institutionalization of a national fund for rural development. This fund should be based on texts defining incentives for rural development and would establish the pre-requisites for the granting and utilization of subsidies and loans. These texts should be defined by the MDR and would concern:

* The subsidies, which could be awarded in the name of an establishment or group of producers' organizations. The amount of these subsidies could be fixed at a value to equal to the producers' shares or dues; the money from shares and dues should be set aside for initial outlay and the rest for working capital.

* Long-term and Medium-term Equipment Loans, which should be granted to sponsoring agencies on the one hand, so that they can fulfill the requirements fo the consolidation to their activities, and to producers' or-

ganizations on the other hand, so that they can satisfy well defined investment needs; for example: agricultural mechanization, pastoral wells, sinking deep wells for irrigation, water and soil conservation work, etc. These loans should be awarded under encouraging conditions, such as:

Low interest rates, grace periods, etc., and their amounts should account for a minimum of self-financing.

* Short-term farm loans (1 year) which should be awarded to sponsoring agencies so that they can organize their action programs well. These loans would be given at low interest rates.

* Farm loans (6 - 12 months), to be granted to producers' organizations, covering certain factors of production and eventually consumer needs (food products). These loans could be granted in the following manner: once the loan is approved, an agreement is drawn up between the credit agency and the most competent subsidiary agency or any other agent authorized to deliver the factors or products for which loans were made. For example, a loan for fertilizer or chemical treatment products would have to go through the OMC (or SONADER depending on the case); a loan made to obtain livestock feed or veterinary medicine or whatever could go through SONICOB and so on. Such loans must be awarded free of any interest charges. For the repayment of these loans, the credit agency might receive a discount on the official price for the merchandise in question which would be justified by the economy of scale which is likely to realized by the supplier and by the guarantee of a sale.

2.1.2.2.3.1. Price Policy, given the impossibility of effectively controlling the markets for the main products in the rural sector because of the multiplicity of operations and the characteristics of production, and given the need for harmonious and balanced development of the rural sector, it is mandatory that a price policy be adopted. This policy should lean toward increasing productivity and not penalizing the rural population. In other words, it should focus on the prices paid to the producers at the same time as prices paid by the producers.

With regard to prices to the producers at the beginning of each agricultural season, the prices for the primary products (cereals, animal products, etc) would have to be studied and fixed at profit- making, competitive prices; in other words, these prices should be accepted by the para-statal agencies in order to counteract a monopoly by other operators on the market.

These prices should be obtained by the public agencies in consultation with the Planning Office, the MDR technical division and the Department of Commerce. Among other things, they should take into account the geographical distribution of the productive zones and the food habits and practices of the rural population.

Another factor which is no less important in determining the price policy and which should be taken into consideration as much as possible, is the policies of bordering countries (Mali, Senegal) in this domain. Any distortion sooner or later would induce failure in efforts already made. For that reason, any national price policy should be introduced in the framework of an inter-state community policy whose terms were fixed beforehand by the states concerned.

Moreover, in order not to penalize the rural sector and to allow a real growth in the income of rural people, it would be worthwhile to extend this price policy to:

- The prices of the production inputs, which should be officially approved on the basis of stabilization of transportation costs.

- The prices of certain non-foodstuff consumer products. This would be a matter of considering the rate of change in the price indexes for these products compared to the change in the price indexes of products from the rural sector. Care should be taken that productivity gains from the rural sector not be artificially inflated by other sectors or by imports through price mechanisms.

2.1.2.2.3.2 Protective Measures. This involves a set of measures aimed at protecting the producers against speculations and eventually against climatic hazards. This would require a certain number of actions, such as:

- drawing up legislation governing commercial enterprises and defining the field and scope of their activities.

- reinforcement of the regulatory arbitration roles and of para-statal agencies;

- instituting a mutual insurance system for the rural activities most vulnerable to climatic hazards and natural disaster; such an institution should act in collaboration with the farmer's credit institution if not be a part of it. It must be recognized that such action is difficult to envisage in the near future, given the current characteristics of rural production, but it could be established later on once production structures have begun to consolidate.

2.1.2.3 Establishment of Rural Development Planning Committee:

The problem of distance in Mauritania, the disparities in the development potential of its regions, and lastly the need for an integrated and realistic plan justify establishing planning committees on two levels:

2.1.2.3.1 On the regional level: the regional rural development committee. The purpose of this committee should be:

- to prepare and propose a regional development program to the MDR central authorities. This program should take into account the actual potentials of the region as well as its problems.

- an assessment of the means required to carry out the proposed program.

- compilation of a follow-up report on the implementation of these programs while concentrating on the main problems encountered.

This committee should hold meetings with the regional technical experts of the MDR, those of the MDR agencies represented in the region and the governor twice a year. In addition, in order to get the rural population involved, it would be a good idea to organize or institute a day-long session studying rural development after each committee meeting. This day would be one of information and discussion about the various problems in the region and the

proposed development program, and would pit the members of the technical committee against the rural population, represented by the village chiefs, by heads of communes or professional organizations, etc.

2.1.3.3 At the central level: The national planning committee for the rural sector: The purpose of this committee would be to prepare a preliminary plan for the rural sector based on the regional plans. The regional plans would have to be coordinated and and synthesized, especially with respect to the supportive measures.

This committee should meet twice a year and would be comprised of:

- The MDR central and regional directors of susidizing agencies.
- The directors of MDR agencies.
- The representatives of other ministerial departments, notably of equipment, hydraulics and housing, of health, commerce and industries.

2.1.3 Other Components of the Option

2.1.3.1 Improvement of the Road Infrastructure

For this option, we point out that improvement of the road infrastructure is a related component, which requires programming of investments in that area to meet rural sector needs. In addition, some priority must be given to the various programs in relation to the economic values and social impacts expected from each sub-sector of activity. Hence, we propose putting the accent on the improvement of the road infrastructure.

- the southeastern rainfall which, though it has limited production potential, merits special attention due to the size of its population;
- in the region of the Senegal River, which offers enormous production potential and which should play a major role in realizing the goals of food self-sufficiency;

- in the coastal zone, which offers considerable potential for the expansion of seaboard fishing by mobilizing resources which until now have been untapped.

2.1.3.2 Revision of the Statute of Public Personnel

The aim of this revision should be to motivate personnel called to do fieldwork and the personnel working in the field of research and training for rural development.

The revised statute should propose fixed premiums, and premiums which would vary according to the amount of work accomplished by the personnel in question; travelling allowances would also be given.

Within the framework of this option, it is proposed that the whole of these premiums and allowances should bear on:

15 to 25% of the salary for field personnel (CER level)

10 to 20% for research and training personnel and for supervisory personnel at the regional level

5 to 15% for personnel of central administrative units

2.1.4 Analysis of the Option

Implementing this option requires the mobilization of a certain amount of human and financial resources, which will be analyzed in this section.

What is meant by human resources, is additional personnel for design and supervision required to rebuild and reinforce rural development institutions. The mobilization of this resource implies gaining access to a certain volume of financial means corresponding to:

the cost of additional training activities

the operating budgets of the proposed institutions which are composed of 2 columns of expenses: salaries and the costs of material means for field work

investments corresponding to the initial layout costs of certain institutions which did not exist before.

Added to this package are the financial resources which must be released for the supporting measures for the rural sector such as credit and subsidies.

2.1.4.1 Analysis of Human Resource Requirements

2.1.4.1.1 Requirements of the Bureau de l'Evaluation et de la Planification du Secteur Rural (BEPSR - cf 2.1.2.1.1.)

In theory these requirements are assessed to be:

a director - agricultural economist

a very high-ranking specialist for each sector

a group of very high-ranking experts in special fields related to production such as planning, statistics, sociology, project analysis and documentation.

These specialist, who would be top managers would be asisted by one or two (middle-ranking) associates or supervisors according to the need:

So, these requirements could be established as follows:

Table 4 : Personnel Requirements of Planning Bureau

	Top Level	Middle Level	Execution
Director	1		
Irrigated Farming Agronomist	1	2	
Dryland Farming Agronomist	1	2	
Oases Farming Agronomist	1	2	
Zootechnician	1	2	
Agricultural Engineer	1	2	
Veterinarian	1	1	
Environmentalist	1	2	
Statistician	2	3	12
Planning Expert	1	1	2
Project Analyst	1	1	2
Rural Sociologist	1	1	2
Documentalist	1	1	-
TOTALS	14	20	18

2.1.4.1.2 Requirements of the Research Extension and Personnel Training Division

(Direction de la recherche de la Vulgarisation et de la formation des cadres (DRVFC - Cf. Chapter 2.1.2.1.2.)

Considering this division's diferrent duties, it should be staffed by :

4 agronomists, including a director

2 agronomist-zootechnicians

1 veterinarian

1 agro-economist

1 documentalist in charge of external relations, among other duties,

or a total of 9 top level managers. They would be assisted by 10 middle-ranking managers and 8 supervisors.

For the research and training institutions, we propose:

- the gradual replacement of expatriate researchers by nationals between 1981 and 1990. As a basis we are using the current number of expatriates, which is 18, and who are distributed among the CNRADA, CNERV and ENA.

- the creation of 2 research units within the CNRADA: the first for agricultural engineering research and the second for rural economy research. The needs of these new units could be determined as:

2 agro-economists

2 agricultural engineers

2 middle-ranking executives

8 supervisors / field personnel

The minimum requirements for the DRVFC and the research and training institutions can be summarized as follows:

31 top executives

14 middle-ranking executives

16 supervisors /field personnel

2.1.4.1.3 Requirements of the Bureau de l'Inventaire des Ressources Naturelles (BIRN - Cf. Ch. 2.1.2.1.2)

According to the importance of each resource, the requirements have been assessed as follows, in addition to the director:

Hydraulic Resources

-1 Hydraulic engineer

- 1 Hydrogeologist

1 Agronomist /meteorologist

Sylvo-pastoral Resources

1 Pastoralist

1 Forestry Expert

Soil Resources

2 agronomists specializing in pedology.

To this should be added 3 other specialists:

- 1 photo interpreter

1 cartographer

1 documentalist

Hence, the requirements in high-level specialists have been set at about a dozen managers. They should be assisted by 14 middle-ranking managers and 5 employees who are essentially draftsmen.

It must be noted that these requirements correspond above all to design and supervisory tasks and also need to be reinforced by teams working directly in the field (test drilling wells, etc.). For our paper, we have assumed that the existing teams are largely adequate.

2.1.4.1.4 Requirements of the Legal Division or of Rural Institution (Cf. Chapter 2.1.2.1.1.)

This division's needs have been assessed as 5 top-ranking personnel, including:

1 director

1 socio-economist

1 agronomist

1 lawyer

These top persons would be backed by 5 middle-ranking managers and 10 supervisors. Depending on how requirements develop, this division should be reinforced by a certain number of teams or mobile units.

2.1.4.1.5 Requirements of the Rural Production Division Cf. Chapter 2.1.2.1.2)

The needs in top-ranking personnel can be assessed as follows:

1 managing director, an agronomist

4 assistant managers and specialists, one per subdivision

1 head of the extension service

3 agronomists, including an entomologist

1 zootechnician

1 pastoralist

1 veterinarian

2 forestry experts

1 agricultural engineer

1 hydraulics engineer

i.e., a total of 16 top executives who should be assisted by 20 middle-ranking executives and 15 or so supervisors.

2.1.4.1.6 Requirements of the Regional Commissions for Rural Development (Cf. Ch. 2.1.2.1.1)

The rank of the staff members at the regional level should reflect the importance of the different rural activities and the principal areas of intervention. Table 5 below shows the proposed staffing per region.

Table 5 : Ranks of Personnel in the Regions

Region/Area of Action	01	02	03	04	05	06	07	08	09	10	11	12
Agronomy	x	x	x	x	x	x	x		x	x	-	-
Animal Husbandry	x	x	x	x	x	x	-		-	x	-	-
Animal Health	x	x	x	x	x	x	-		-	x		-
Crop Protection	x	x	x	x	x		-		-	x		-
Agricultural Engineering	-	-	x	-	x		x		x			-
Forest/Rangelands	x	x	x	x	x	x	-	-	-	x	-	-

x : Top level

- : Middle level

The table reveals the requirements to be:

41 high-ranking personnel

20 middle-ranking personnel

2.1.4.1.7 Requirements of the Rural Outreach Centers

The personnel requirements of the CER's such as they were defined earlier (Cf. Ch. 2.1.2.1.1) depend on how many CER's will be installed, which depends on the active population which should be involved or supervised.

Taking into account the production goals assigned to the rural sector within the scope of this option, it would be necessary to reach the maximum number of workers involved in rural activities in order to spread the technical progress required to attain these objectives; of course, that would depend on the production efforts demanded of each sub-sector. In light of all this, it is proposed that in the long term and around the year 2000:

- the totality of actively employed persons involved in irrigated and traditional farming should be directly reached by the supervisory and support action at the CER level, given the new character of the technologies proposed. (1) It must be noted that about 50% of this active population are now practicing at least one type of animal husbandry in addition to farming. (2)

- only 50% of the workers involved in oasis farming should be directly affected by development actions at the CER level, given the latter's extremely polyvalent nature.

- only 50% of the workers involved in animal husbandry should be directly affected by development actions at the CER level, given the relatively limited efforts required of this sub-sector and also the possibility that a good part could directly benefit from these development actions.

- due to the fact that two alternatives for production were taken into consideration based on the kind of technology adapted (Cf. Ch. 2.1.1.1), two levels of CER requirements should be determined.

(1) Cf. RAMS Option Paper on Rural Production, 1981.

(2) RAMS study on Agricultural Production.

+ For the first alternative, with mechanization, the total number of workers who should be directly affected by actions at the CER level - and keeping in mind what was established above - would be 250,000. Based on the hypothesis that one CER should affect 250 producers, the minimum number of CER's should be 1,250. Personnel requirements for these CER's would then be assessed as follows:

- 1,250 extension service agents (moniteurs) at the rate of one per CER, 250 supervisors (assistant engineers) and 50 extension service engineers;

- 250 liaison and service agents (conducteur de trauvaux), or one agent for 5 CER's who would be supervised by 25 agro-economist-engineers at the rate of one for 10 agents;

- 417 livestock agents (moniteur) at the rate of one for 3 CER's, who would be supervised by 139 livestock assistants (1 for 3) and 35 veterinarians (1 for 4 assistants).

To these requirements should be added the necessary skilled personnel for the maintenance and repair of the equipment. Although this personnel would not be paid by the MDR organizations, it should be kept in mind for training purposes. These requirements have been assessed as:

150 mechanics (BEM level), 1 for every 10 tractors;

29 warehouse men (BEM level), for every 50 tractors

29 fitter mechanics (BEM level), 1 for every 50 tractors

29 shop superintendents (BT level), 1 for every 50 tractors

179 apprentice mechanics.

Location of CER's

Considering the spatial distribution of the population of sedentary producers, who are scattered throughout more than

2,400 villages and of nomadic producers who are spread all over the southern third of Mauritania, it is proposed that the CER's be implanted:

- in villages with populations of between 500 and 1,000 inhabitants at the rate of 1 CER per village, the number of the latter being 290;

- in villages with over 1,000 inhabitants at the average rate of 2 CER's per village, the number of these villages being 113, hence 226 CER's;

- the remaining CER's should be placed in the best possible locations as determined by studies on population movements and concentration.

+ For the second alternative, with traditional (animal-draft) farming, the number of workers who should be affected is at least 261,000, which would require 55 additional CER's compared to the first possibility, corresponding to a 4.4% increase in personnel requirements.

In addition to these requirements, one should anticipate the training of artisanal blacksmiths for repairs and for making equipment. The blacksmith need could be assessed as follows:

1 blacksmith for 200 workers practicing irrigated farming;

1 blacksmith for 400 workers practicing traditional farming, which amounts to a need of 455 blacksmiths.

2.1.4.1.8 Requirements of the Para-Statal Agencies (Cf. Chapter 2.1.2.1.1)

For these agencies, we suggest the following for the record:

- Agencies such as the OMC, SONADER, and SONICOB should depend more on the MDC structures; eventually, these agencies could take charge of selected CER's.

- For the OMC, it is suggested (i) that it be provided with a production unit for selected cereal seeds earmarked for distribution to the producers. This unit should take up the reins from ongoing projects working in that area (seed project, etc.); this action should be extended to cereal crops, in general;
(ii) that a logistic and operational research unit be designed to organize distribution or collection campaigns in the best possible way.

2.1.2.1.2 Artisanal Marine and Inland Fishing

Cf. Option C

Summary of Human Resource Requirements

Table 6 below summarizes the total potential requirements in personnel for the MDR structures.

Table 6 Summary of Personnel Requirements for Option A

Administrative Unit	Ministry of Rural Development (Total Requirements)								Totals	
Level of Training	BEPSR	DRVFC	DIRN	DIR	DPR	CRDR	CER A_1	CFR A_2	A_1	A_2
Top managers	14	31	11	5	16	41	110	115	228	233
Middle-ranking managers	20	14	14	5	20	41	389	406	499	516
Supervisors and field personnel	18	16	5	10	15	41	1917	2000	2020	2085

Taking into account the current available resources, which are as follows: (1)

(1) Based on the draft report by the planning committee for rural development.

40 top managers

54 middle-ranking managers

240 supervisors

and taking into account a replacement rate of 3.3% annually (2) and assuming that this personnel would be installed progressively between 1981 and 2000, the real potential requirements (in the year 2000) would be:

268 top manager for A_1 and 273 for A_2

599 middle-ranking managers for A_1 and 622 for A_2

2396 supervisors and field agents for A_1 and 2484 for A_2

To these requirements one should add:

For A_1 : 416 persons on the mechanics staff

For A_2 : 455 blacksmiths

2.1.4.2 Assessment of Financial Resource Requirements

As was pointed out earlier, the financial resources required for the implementation of this option are represented by:

- the costs of supplementary training;
- the costs of installing new structures;
- the operating budgets for the proposed structures
- the funds to be released for loans.

(1) We have assumed that each agent serves for an average of 30 years.

(2) Evaluation of the Formal Education System in Relation to Development Objectives, RAMS 1980.

2.1.4.2.1 Training Costs

+ First Alternative (with mechanization)

These costs were evaluated at 1980 prices from the basic costs established by the RAMS Project (1), and are shown in Table 7, which follows: (see Table 7) (on

Table 7 : Assessment of Training Cost for Option A1

(Unit : Millions of UM, 1980)

	Number of Persons	Cost of Elementary and Secondary Education	ENFVA/Lycee Technique Education Training Center	Higher Education Abroad	Total
Top managers	268	151	-	162	313
Middle-ranking managers (technician)	599	237	-	146	483
Supervisors + field personnel	396	489	2814	-	3303
Mechanics (2)	416	85	488	-	573
Totals		1062	3302	308	4672

(2) The training costs for this personnel has been equated with the cost of training moniteurs and conducteurs de travaux.

These costs can be broken down as follows:

central personnel training	283	million UM
regional personnel training	161	" "
personnel training for the CER's	3632	" "
research, extension service, training	23	" "
mechanics	573	" "

* Second Alternative

The total training cost for the second alternative would be 4352 million UM, broken down as follows:

central personnel training	283	million UM
regional personnel training	161	" UM
CER personnel training	3792	" UM
research extension service, training	23	" UM
blacksmith training (1)	93	" UM

* In the case of Artisanal Maritime Inland Fisheries (Cf. Option C)

2.1.4.2.1 Costs of the New Structures or the Equipment Budgets

This chiefly covers the costs of installing the new Rural Outreach Centers (CER's) and the new personnel, who must have a minimum amount of equipment for their base of operations as well as means of transport such as:

housing for the CER agents

office and office equipment

---

(1) The cost of training a blacksmith has been equated with with the basic training costs for the other categories of personnel.

This equipment is rather expensive but indispensable for for the operational efficiency of the different units.

2.1.4.2.2.1 Rural Outreach Centers

* For each extension service agent and each livestock agent at the CER level, the following is proposed:

1 two-room dwelling with outbuildings, at a total cost of 300,000 UM;

1 office and 1 guest house with outbuildings at a total cost of 400,000 UM;

1 small warehouse for small equipment for 150,000 UM

1 means of transportation for 25,000 UM.

* For each livestock agent the following is proposed:

1 dwelling at 300,000 UM;

1 office and 1 small pharmacy warehouse at 300,000 UM;

1 means of transportation for 25,000 UM;

* For each liaison and service agent:

1 two-room dwelling at 300,000 UM;

1 office at 100,000 UM;

1 means of transportation 25,000 UM.

* For each veterinarian, extension service engineer or agro-economist:

1 jeep at 650,000 UM.

For all of the CER's the installation costs would come to:

- 470.4 million UM for the dwellings;
- 711.15 million UM for the offices and warehouses;
- 87.98 million UM for the means of transportation;

i.e., a toal of 1,867 million UM at the 1980 price for alternative A_1 (1250 CER's) and 1950 million UM for alternative A_2 (1305 CER's).

2.1.4.2.2 Regional Commissions for Rural Development:

- equipped offices at 100,000 UM per new agent
- 2 service jeeps for each region at a cost of 1,00,000 UM.

For all of the regional structures, the costs would come to 35.4 million UM.

2.1.4.2.2.3 Central Administrative Units

- Equipped offices at 100,000 UM per new agent and administrative unit;
- 3 (light) service cars per administrative unit at 400,000 UM per unit, or a total cost of 24 million UM for all.

2.1.4.2.2.24 Research and Training Institutions:

* Agricultural Engineering Division

1	small laboratory and workshops	500,000 UM
1	group of offices	400,000 UM
1	equipment shed	400,000 UM
Equipment		500,00 UM
1	jeep	650,000 UM
Documentation		50,000 UM

* Rural Economy Divisions

1 group of offices	600,000 UM
2 jeeps	1,300,000 UM
Calculating equipment & miscellaneous	100,000 UM
Documentation	50,000 UM

or a total cost of 4.25 million UM.

2.1.2.2.2.5 Costs of Installing Machine Repair Shops and New Villages.

Each of the two alternatives considered requires a certain amount of additional infrastructure;

- machine repair shops in case A_1. It is proposed that 29 shops be built at a ratio of 1 shop for 50 tractors. The total costs of these shops would amount to 290 million Um.;
- villages for the employers, which should be set up on the irrigated parcels in case A_2. The installation of those villages assumes a minimum of socio-economic and socio-cultural infrastructure. Based on a minimum of 300,000 UM per employee, the total cost of installation operations would be 990 million UM.

2.1.4.2.2.6 In the Case of Artisanal Marine and Inland Fishing see option C.

2.1.4.2.2.6 Summary

The total costs of the new structures would amount to:

2220.5 million UM for alternative A_1;

3003.0 million Um for alternative A_2.

2.1.4.2.3 The Operating Budget:

Only the operating expenses of the MDR structures have been taken into consideration. These expenses are comprised of two parts:

salaries;

expenditures for equipment, props and maintenance.

At present, the MDR operating budget is appropriated as follows:

75% for personnel

25% for equipment.

As a part of this option and for better operational efficiency of the MDR offices, it is proposed that the column for equipment expenditures equal at least 60% of the personnel column.

Hence, based on the average salaries for 1980, which are increased an average of 15% and accounting for an increase of 2.5% per annum, this operating budget (1) could be estimated as:

321 million UM in 1985 for A_1 and 237 million UM for A_2

478 " " 1990 for A_1 and 491 " UM for A_2

672 " " 1995 " " " 692 " " " " A_2

969 " " 2000 " " " 1000 " " " " A_2

For the fishery budget, refer to Option C.

2.1.4.2.4 The Credit Fund for Rural Development

This fund should be comprised of two parts:

* A subsidy - for the consolidation of the production structures. This fund could be assessed in the following manner:
  Assuming that in each CER and CEPA at least one producer's cooperative is formed, one would then have 850 cooperatives;

(1) A 10% increase of the total was included for miscellaneous administrative charges.

now, if it is accepted that each organization has 150 members, each contributing 1,000 UM, the requirements of this fund would be fixed at 850 x 150,000 UM, or 127 million UM.

+ A credit fund made up of two smaller funds: one for rural development and one for artisanal marine fisheries. The requirements of these funds could be assessed as follows:

Allowing that beginning in the year 2000:

100% of the workers in traditional and irrigated farming;

50% " " " in oases;

50% " " " in livestock raising;

would be affected by extension services and by loans, which should cover 75% of production costs excluding labor (investment and recurring costs), the capital required for the credit fund for rural development should cover:

68% of the agricultural options expenses;

5% of the livestock option expenses.

Furthermore, based on the hypothesis that the present extension services reach roughly 10% of the active rural population, the pace of the number of active rural dwellers trained and affected by loans would progress between 1981 and 2000 at the rate of:

5% per annum between 1981 and 1990 for irrigated and traditional farming;

2% per annum for oasis agriculture;

15% per annum for livestock raising.

As concerns credit for fishing refer to Option C.

2.1.4.2.5 Summary of the Financial Resources Required for Option A.

Table 8 summarizes the cost projections for the option between 1982 and 2000. The hypothesis is that the option should be implemented from 1981 on in order to be completed in 2000, the year of optimum performance.

Table 8: Summary of Financial Resources Required for Option A

(Million UM in 1980 prices)

	1985	1990	1995	2000
Rural Development				
* Option A_1				
Training	212	212	255	255
Equipment	75	75	89	89
Operations	321	478	672	969
* Option A_2				
Training	174	174	262	262
Equipment	96	96	114	114
Operations	327	491	692	1000
Subsidies (A1 and A_2)	5.5	5.5	7	7
Credit (A_1 and A_2)				
Agriculture	262	863	2120	3509
Livestock	104	138	172	182
S/Total A_1	980	117	3315	5011
S/Total A_1	969	1768	3367	5074
S/Total A_2				
Fisheries				
Training	5.5	5.5	1.5	1.5
Equipment	8		-	-
Operations	8	13	21	33
Credit	70	70	70	70
S/Total	92	88	93	105
Total with A_1	1063	1860	3408	5116
Total with A_2	1060.5	1856	3460	5179

* Figures rounded.

Option B

2.2.0 General Outline

This option is oriented towards regional integrated or decentralized development passing through several successive stages and favoring localized actions which take the complexity of the physical and human environment into account. It proposes activating networks of potential development sites. This would entail facilitating the access of rural coomunities to appropriate technological progress, encouraging them to participate actively in their own development. This approach accentuates the integration of the diverse aspects of rural development at the most basic level and takes into account the complexity of the Mauritanian environment.

It is justified by:

- the cleavage between rural communities and existing economic and political structures, which is due to the latter's poor adaptation to development needs.
- the lack of integration and coordination of development programs during the most recent national plans.
- the relative impoverishment of the rural sector compared to the other sectors, which must be rectified in light of this sector's great socio-economic importance.

2.2.1 Objectives

This option was conceived to support the options of sectoral production, which seem to be the most realistic considering the Mauritanian context. It should allow their production goals to be attained within given time frames by stressing the integration of the diverse aspects of rural development, at the most basic level to that later. It may later be extrapolated to higher levels.

The options in question and their objectives are presented as follows:

2.2.1.2 Irrigated agriculture and Dryland Agriculture : To Increase Production through Improved Technology.

This option provides for a moderate pace of improvement of the irrigated plots and the use of improved technology in traditional

agriculture. It should make it possible to produce 211 000 tons of cereals representing 67% of the cereal demand in the year 2000. This production level could be reached in several fashions depending on the type of technology adopted and the available labor force for farming: only one possibility has been considered; it assumes the farming of:

- 36,311 ha. of irrigated rice, with animal-draft and a double cropping on 65% of the surface area, thereby employing 20,300 workers full-time;
- 20,727 ha. of improved dieri land, within the Senegal River valley, animal draft employing 5,922 workers;
- 81,931 ha. of improved rainfed cropland (animal draft labor over 50% of the surface) in the southeast, employing 59,374 workers;
- 21,000 ha. of recession plots in the wadis, employing 27,122 workers.

In this way, this option would guarantee the full employment of active persons available for work in agriculture which would represent 112,718 persons (1).

2.2.1.2 The Oasis Agriculture Sub-sector: Rationalized Use of Existing Palm Groves by Implementing Oasis Protection and Programs

This would involve improving the use of existing palm groves and rationalizing water resource use, while protecting the palm groves against deterioration. This option would allow the production of:

33,200 tons of dates

2,500 tons of vegetables

300 tons of cereals

5,000 tons of fodder

250 tons of henna:

(1) This is the projected figure for year 2000 of the active population employed in 1980, at the same rate as the population growth rate, i.e. 2.5% per annum.

or the double of present production levels. In addition, it would make it possible to double the labor force in the oases. The number of workers totally or partially involved in this activity would be between 20,000 and 30,000 individuals (1).

2.2.1.3 The Livestock Sub-Sector: Improve the Livestock Yield.

This option assumes an improvement in the productivity of the sub-sector and increased off-take from herds by means of a number of projects and actions including supervision, research, extension work, and marketing. It should permit a growth of 20 to 25% of both the number of animals and of production under normal climatic conditions, 4% under the worst climatic conditions and 85% under the most favorable conditions.

2.2.1.2 The Fisheries Sub-sector

2.2.1.4.1 Inland Fishing The option proposed suggests the launching of pisciculture in order to make up for the drop in production which will result both from development of the Senegal River valley and from basic ecological conditions. It would permit production to be stabilized and the ecosystem to be protected from over-fishing. This option would make it possible to produce 14,500 tons of fish in the year 2000, including:

7,000 tons from traditional fishing in the river;

7,500 tons from "fish farms" and through the development of 1,600 ha. of artificial ponds or pools near irrigated plots.

From the employment viewpoint, it would permit the employment of 7,250 river fishermen.

2.21.4.2 Marine Fisheries: The option is oriented towards a sustained development of artisanal and semi-industrial fishing to meet domestic and export needs. It should also establish a solid foundation for a national fishing fleet and build up a strong group of sea fishermen via semi-industrial fishing. The production expected in the year 2000 with this option would be approximately 76,000 tons, including:

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(1) Ref. RAMS Oasis Agriculture.

- 36,000 tons from artisanal fishing, which would employ 4,600 fishermen;
- 40,000 tons from semi-industrial fishing, which would employ only 320 fishermen.

2.2.1.5 Finally, the options described above and their objectives assume an appreciable but above all a feasible amount of additional production. Based on present production output, production should grow at the following growth rates between 1980 and 2000.

- 12.5% per annum for cereal production, but a good part of which would be due to the increase of the irrigated areas (28% per annum between 1980 and 1990 and 50% between 1990 2000)
- 5% per annum for date production
- 0.2% to 4.25% per annum for livestock raising depending on the weather conditions
- 20% per annum for artisanal marine and inland fishing

Achieving such levels of performance would require relatively modest efforts in technical progress since the technologies suggested by these options are in most cases only improvements on existing technologies. Nonetheless, they require relatively modest improvements in existing knowledge, supervision, production inputs, etc., but are adapted to the Mauritanian context.

2.2.2 Components of the Option

Just as for Option A, the accent has been placed, but to a lesser extent and with a different approach - on two main factors which seem to play decisive roles in the institutional framework and which are : the rural development institutions and inputs from the state.

2.2.2.1 Structuring Potential Development Sites

By "potential development site," is considered to be a homogeneous geographical unit with certain unique physical and human characteristics and a certain potential for development which the extension program proposes to gradually put into action.

This action consists of devising master plans for integrated development of the different agro-ecological zones or, what is even more suitable, for the different regions.

These plans should be approached in successive stages in the following manner; Within each agro-ecological zone or each region (and depending on the complexity of their ecosystems), one or several which are physically and humanly homogeneous basic units could be considered. These units would be sites whose development potential would be studied in order to reach concrete suggestions for their integrated development. Then, depending on available means and resources, the sites studied in the same region should be studied jointly with a view of integrating them in a master plan for regional development and eventually inter-regional development at a later stage.

The study and design of such plans involve the MDR structures mainly through agriucltural research, rural development research in general, through non-formal and formal training and extension work. To a lesser extent, these plans also involve other ministerial departments such as health, education, infrastructures, economy and finance. The following stages are necessary in drawing up and implementing these plans:

2.2.2.1.1 Knowledge of the Environment at the Site Level

This would involve studying and understanding how the natural ecosystems funciton. These natural ecosystems are characterized by:

- their physical environment and potentials;
- their socio-economic and human environment along with its institutional organization and its productive potential.

In other words, this would imply studying the existing systems of production in order to identify their real technical possibilities and the problems hindering their development.

2.2.2.1.2 Finding the Bases of Development at These Sites

This would be a matter of finding ways to bring about change and means of rationalizing existing systems of production, making them better adapted to development needs. In the present state of affairs, there is a certain "disintegration" of the systems of production resulting from the deterioration of the environment and from the weakness of the present institutional framework.

The possibilities for change should take into account the true technical potentials and the socio-economic realities of each site: i.e., they must be approached from an integrated perspective and assume an optimal and rational use of environmental resources. This stage would make use of field studies and research and lead to a proposal for technically and economically feasible systems of production. These improved production systems would reflect existing systems of production in which changes would be introduced.

Beside desiguing and proposing systems of production, which chiefly concern the economy, other supportive measures dealing with social conditions such as health, nutrition, education, infrastructures, should be proposed; some coordination or cooperation between the different institutions implied is indispensable.

In summary, all of the proposals pertaining to a given site should be incorporated into an action program for development. Subsequentl various sites in the same zone or region should be studied together from an integrated perspective in order to create a regional development program whose priorities should be determined in accordance with the development goals.

2.2.1.2.3 Materialization of These Bases of Development

This stage consists of diffusing the proposed systems of production and concretizing the other supportive actions.

The diffusion of productions systems should be executed in the form of simple processes designed beforehand. This implies the availability of adequate supervisory personnel and dynamic and functional extension services. To meet the new demands for the means of production which eventually be created by the diffusion of these processes, it would be necessary to set up a series of measures to meet these new demands. Farming credit could be cited among these measures.

Furthermore, it would be necessary to perfect methods for assessing the different processes proposed so that the evolution of the systems of production can be guided in the right direction and so that any problems which might come up can be solved within a reasonable amount of time.

As for the materialization of other actions, this involves the rural development institutions less than the other structures. It stands to reason that the rural development institutions should be able to coordinate the actions of the various departments concerned in order to increase the effectiveness of the different development programs.

2.2.2.1.4 Potential Development Sites

To provide a more concrete idea of the nature of the sites, three types of sites have been distinguished:

2.2.2.1.4.1 Existing Sites or Those Now Being Developed - This includes all local-level projects now underway. These projects should be integrated in an effective, operational manner into development programs to form uniform regional networks. These networks should be combined into a national network, which would be the MDR institutions themselves.

Moreover, the integration of these projects into a uniform, decentralized development network is warranted not only by the multitude of existing agencies and their independence from one another, but above all by the need to guarantee follow-up programs capable of continuing the actions undertaken.

Among the other advantages of such integration, can be noted the training of MDR managerial personnel on the sites, which could be administered by the project assistants. Such training, which is nothing more than the transfer of knowledge, is of capital importance for the development of a site, especially in the follow-up phase.

However, it must be made clear that under no circumstances must the MDR take the place of the various local agencies, rather it should play well-defined roles, viz:

(i) a role as coordinator, in compliance with the national development objectives and in collaboration with the institutions linked with the projects.

(ii) a role as permanent evaluator and adjuster, for no matter how objective the points of view or the approaches of the different agencies may be, there is always a subjective side which can only be assessed by the effective participation of the local authorities.

Some projects which could be implemented on development sites are cited below:

a. The Guidimakha Integrated Rural Development Project (DRIG), financed by USAID.

b. The development project for the Guidimakha region financed by "War on Want", which concerns a dozen villages.

c. The Integrated Rural Development Project at Barkeol (Assaba) financed by the Lutheran World Relief.

d. The CARITAS Integrated Project, which involves 4 villages in the Department of Maghama (Gorgol).

e. The Village Integrated Rural Development Project, financed by COSOC (4 rice fields), which affects 4 villages in the vicinity of Rosso.

f. The project for the promotion of dryland crops in the Assaba and Guidimakha regions, financed by the FAO.

g. The Project entitled: "Increased Crop Yields through Better Means of Production financed through the west German aid program covering 9 villages in Trarza and 5 in Brakna.

h. The "Vegetable Production Project" financed by USAID, which involves several villages in various regions.

i. The Project for integrated development of oases in Assaba, financed by USAID and involving 4-6 oases.

j. The small rice fields financed and supervised by Lutheran World Relief in the vicinity of Rosso (3 plots) and in Boghe (Silbe : 1 plot).

k. The project for sinking of 47 wells in Trarza and Brakna, financed by the Arab under the auspices of hydraulics division (Hydraulics Ministry).

The small plots of irrigated land now being supervised by SONADER can be added to these projects. These plots could be grouped by site, which would be managed in collaboration with the MDR. The same would hold for future plots.

It is worth noting here that although most of the projects are now ongoing, some were not approached from an integrated perspective because a preliminary baseline study was not made for them; consequently, special attention should be given to them before it is too late.

For the other projects now underway which are not localised but operate on a nationwide scale, the food crop protection project (for example), it would be more effective in the future to have these projects be implemented in the sites now being developed or that are to be developed.

2.1.4.2 Potential Sites to be Developed in Collaboration with the MDR Dependent Agencies. This essentially concerns the plots which will benefit from hydro-agricultural development in the future, either in the river valley or in the interior of the country, i.e., the development project for the Tagant of the project for constructing dams in the Brakna-Gorgol area, etc. Such projects could be organized on the sites, where SONADER and the MDR should try to work out a plan of collaboration. Conceivably, the MDR could handle preliminary land preparation, inform the local people of the process and later on, handle the actual supervision of the sites (follow-up, extension work, etc.) SONADER would handle actual land improvement and be responsible for maintenance work on the structures, and some agricultural services. In any case, the formula of cooperation with SONADER should be looked into.

Along that same line of thought, new sites could conceivably created under the direction of the MDR in collaboration with the OMC or SONICOB, for example, especially in the southeastern agro-

pastoral zones. These sites could be placed among the main village groups in the region or in the villages located along the nomads' main trek routes.

In that case, the CMC and SONICOB's participation should entail a number of services (supplying marketing) and eventually short-term loans; by the same token, these agencies would serve as executors of government price policy.

2.1.4.3. Potential Sites to be Developed by the MDR: These are the sites which could be developed in the regions or zones showing certain potential and which are not benefiting from any projects or development activity at present. This is particularly true of the Western and Eastern Hodhs, Inchiri, Adrar and certain departments in northern Trarza and Brakna.

Such sites should be created so that there can be a geographically harmonious development scheme and most of the zones have enough potential to justify such actions.

Setting up sites in these zones should be done gradually and go through all of the stages listed earlier. The subsidiary agencies' participation on these sites could be sollicited whenever justified. Otherwise, it would be possible to establish a central cooperative of Rural Services which would support the development of such sites (Cf. Ch 2.2.2.2.3.2.)

In conclusion, Map no.1 Potential Development Sites, indicates the location of the different types of sites. This is not an exhaustive presentation but only an indication of the most important sites.

Indeed, their number should be defined as a funciton of the available means and the desired development goals. This approach seems capable of offering real development possibilities . However, carrying out this plan calls for some adaptation of the rural development institutions to the new needs and a minimum assistance and support from the rural sector.

2.2.2.2. Adaptation of the Rural Development Structures to New Needs:

This component is warranted by the fact that the current organization of the rural development structures is not up to attaining the goals of the option. This stems from a lack of integration

among these structures, certain qualitative and especially quantitative inadequacies and finally, their over concentration at the central level. Overcoming these limitations will require a series of actions, which are:

2.2.2.2.1. The Reinforcement of Research, Extension and Personnel Training and their Integration with the True Problems of Development: This action requires the reorganization of research, extension services and personnel training so that they can play the roles they should play in the development process. This should be done by (i) establishing a central support office for these different activities which could be a head office, for example, and (ii) reinforcing the research and training institutions.

This new support office should have the following duties:

Design, in collaboration with the other departments and associated MDR agencies, a national committee or council on research extension work and training, for which it would serve as General Secretariat; in order to:

study programs covering the principal problems noticed on the sites and which can only be settled locally;

create training programs at all levels (for farmers, trainers, extension agents) in compliance with development needs.

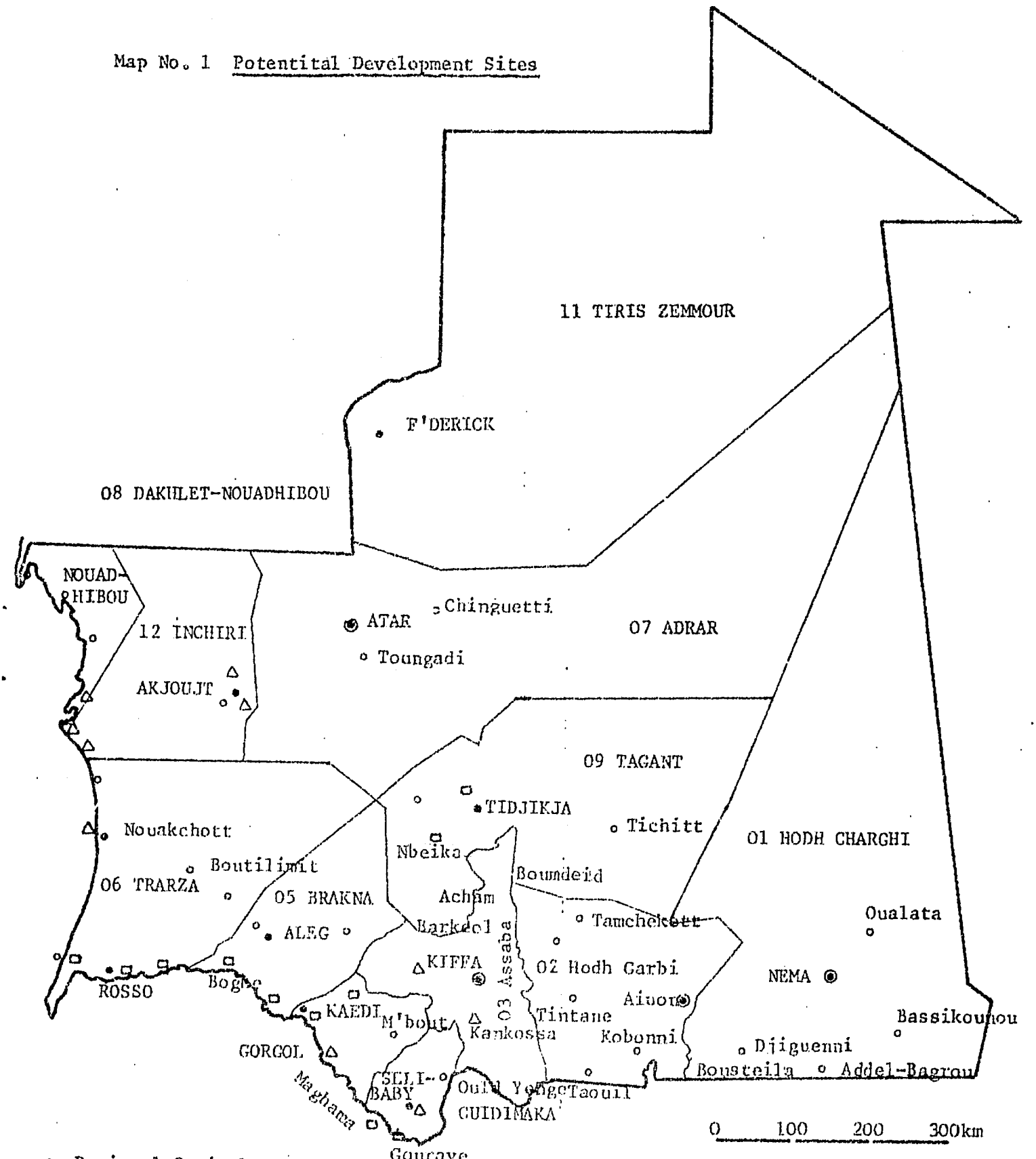
Evaluate these programs and supervise their implementation by the specialized institutions (CNRADA, CNERV, ENFVA...), which would be placed under its supervision.

Formulate concepts to be diffused on the basis of research results, spread themes through regional network channels and handle their evaluation after having determined the proper vehicle for these themes.

Give impetus to international relations and exchanges in the area of research and training.

Design a service of continous training and refresher courses as well as a system of evaluation for the supervisory personnel in development(trainer, extension agents, community development agents, etc.)

Map No. 1 Potentital Development Sites



- Regional Capital
- New site to be developed
- Δ Existing site to be integrated into the development network (on-going or planned projects)
- Existing or potential site to be developed in collaboration with SONADER.

Coordinate training programs for the rural sector with the elementary, secondary and higher educational programs and eventually coordinate cooperative research with the Mauritanian Institute of Scientific Research (IMRS.)

- Research and training institutions should be strengthened so they can satisfy demands. For that reason, we suggest that new research and training units be created.

  In the field of research, this would entail:

  - fortifying the CNRADA's research division in the area of rural development by supplying it with the necessary resources.

  - setting up a rural engineering research division which would tackle the problems of irrigation, hydraulics, soil and water conservation.

  - multiplying the number of stations or research units at the regional level and diversifying them so that they can cover all of the problems of the major agro-ecological zones. Such stations should be directed by staff from the regional networks on sites selected for that purpose. So conceivably, the adminstrative palm groves in some region could be converted into small date palm growing stations and other stations could be set up to develop other crops. Research work should not be restricted to crop development but be extended to the development of the entire crop system as a whole or to relatively complex systems of production. In these stations, in no way should the research focus on theoretical problems but on technically simple concepts whose primary objectives would be to improve the present situation in rural areas and to optimize the the use of local resources and available factors of production. In order to meet these needs 6 research stations could be created and be distributed as follows:

- 2 stations for the Senegal River Valley agro-ecological zones;
- 2 stations for the rainfed agricultural zone;
- 2 stations for the oasis zones and the recessional areas of the wadis.

With regard to training, it would be fitting to establish rural vocational training which aimed at rural youth wishing to improve their technical skills. This could be extended to extension service agents in the form of skills upgrading and refresher courses. This training should take place at well-chosen sites near the research stations or research units. Three training centers could be built, one of which would be placed in the river region, one in the rainfed agricultural zone and one in the oasis, and wadi zone.

In summary, given the amplitude of research, extension and training activities and the multitude of tasks, setting up regional support offices for these activites and task would become a necessity. These support offices would make it possible to distribute efforts evenly and to prevent a bottleneck of activities from developing in the central suport office. IN theory, the responsibilities of the regional support offices would be the same as those at the central level but adapted to regional needs. In addition, rather than handle international relations and exchanges in this field, they would have to develop interregional exchanges, notably those pertaining to the same agro-ecological zones.

2.2.2.2.2 <u>The Merging and Reinforcement of Administrative Sub-sectoral Units.</u>

This involves the formation of a single development network of the administrative units connected with each sub-sector. The forming of such a network should be executed as follows:

2.2.2.2.2.1 At the Central Level, by merging the Agricultural, Livestock and Environmental Protection Departments into a single department which would be the General Department of Rural Production. This department would be called upon to work (i) horizontally with the planning bureau (Cf. Ch. 2.2.2.2.3.) the research division and the agricultural engineering division (ii), vertically with the rural development coordinating unit (Cf. Ch. 2.2.2.2.2.2.4.) and the regional networks.

This department's duties would in theory be the same as they are now (program and control) Planning would be an additional role to be played by the department. This task would consist of designing the rural sector's development plan based on regional plans, and should be drawn up by a national committee on rural development. This department would be assisted by the planning and design bureau and by the rural development coordinating unit. However, some divisions should be rearranged in another way; the following system is recommended:

The Department of Agriculture should be made up of different divisions or services covering the different kinds of crops (irrigated crops, dryland crops, oases) and a plant protection division or service.

The Environmental Protection Department should have two sub-divisions: a resource use division and a regulation and control division.

The Rural Engineering Department should be strengthened and reorganized to include 5 subdivisions or services dealing with the following aspects:

- retention dams for recessional agriculture
- water and soil conservation
- irrigation
- agricultural mechanization
- agricultural and pastoral hydraulics.

This department or service should work closely with the Hydraulics Ministry for anything concerning agro-pastoral hydraulic works.

The division would also be required to have representatives in those regions where rural engineering is a major activity (recessional dams, water and soil conservation, wells, etc.).

Moreover, this department or division of rural production should be reinforced by a group of joint offices:

- a statistics office which would be in charge of agricultural statistics.

- a resource office, which would consist of 3 sections:

  . a soils section

  . a pastures and forestry section.

  . a liaison section connected with the Hydraulics Ministry

This bureau should have guidelines established for the use of resources, which should be kept in mind when drawing up master development plans.

- a legal office which should focus on land tenure problems, problems related to institutions such as cooperatives and on conflicts which might exist in the rural areas, regarding the use of grazing lands, water points, etc....

- a documentation section which would collect in one place all documents dealing with the rural sector. It should be added that the resources office and the legal office should go into the field when requested by the regional authorities to settle special problems which could crop up in their areas.

2.2.2.2.2.2 At the Regional Level, by merging all existing regional representative offices of Agriculture, Animal Husbandry and Environmental Protection, as well as those proposed and connected with research and rural engineering. This merging should foster a single representative office, which would be called the Regional Rural Development Outreach Center or the Regional Development Pole. This center or pole should include a multi-disciplinary team directed by a sole authority and should have the following responsibilities:

- to program and supervise the outreach activities of the sites in the region in collaboration with the subsidiary agencies represented in the regions and with the regional coordination cell (Cf. Ch. 2.2.2.2.4.)

- to program and supervise research, extension work and training activities.

- to collect statistical data.

- constantly to evaluate all activities (outreach, research, extension work, statistics ...).

- prepare a regional development plan. This task should be carried out within a regional committee for rural development, yet to be created (Cf. Ch. 2.2.2.3), and which would bring together all the ministerial departments represented and the public institutions. This plan should include several articles covering the different technical and social aspects of production. It could be subdivided into two parts:

  - Emergency actions which could receive financing from the regional budget would be classified in this first part.

  - All other actions would be classified in the second part.

- Control the implementation of this plan by keeping a regional checklist.

- identify and formulate regional problems and settle them in that very region. This responsibility should apply only to certain types of problems, help should be solicited from the central offices.

2.2.2.2.3 Establishment of a Planning and Design Bureau Serving Development

The establishment of such a bureau is justified by the multitude and intensity of tasks assigned to the Department of Rural Production and the Regional Department Poles. This bureau would simply be an additional planning service which would allow these units to devote themselves fully to carry out their duties. It should act as engineer-advisor in the MDR and have the following responsibilities:

Participate in the preparation of the central plan, which is a synthesis of the regional plans.

participate in identifying integrated projects,

give opinions about the feasibility of the projects.

examine any study by a third party.

advise the Rural Production Department.

make any useful suggestions about supportive measures.

execute studies at the request of the production department.

2.2.2.2.4. Establishment of a Rural Development Coordinating Unit

The establishment of a rural development coordinating unit is justified by the multitude of ministerial departments involved in one way or the other in rural development. In fact, besides the technical aspect of production which chiefly involves the MDR bodies, there are many other aspects which depend on other institutions such as:

health, which is headed by the Ministry of Health and Social Affairs.

the habitat and hydraulics, which are headed by a separate ministry.

infrastructure, which comes under to the Ministry of Equipment, Transportation and Communications.

finance and budget and prices, which are controlled by the Ministry of Economy and Finance, and so on.

The creation of such a unit should be enough to encourage proper integration of the different aspects of rural development and allow realistic planning to take place. It would be placed between the ministerial Cabinet and the various structures of the MDR. It would be called upon to work in close collaboration horizontally with the rural development institutions and the other ministerial departments. Its main duties can be summarized as follows:

to coordinate the activities of the different departments within the MDR.

to head the National Rural Development Planning Committee.

to interact with the other ministerial departments to obtain better harmony among the different action programs.

to interact with the ministerial departments and dependent organizations implicated in price policies, marketing, credit, etc., with a view to defining the guidelines matching the development objectives of the rural sector.

Preferably, this unit would be represented on a regional scale by a regional rural development coordinating unit which would be part of the regional development center or pole.

These regional cells should play a key role in the outreach programs of the different poles. Their duties would be to:

set up a plan of coordination between the different activities and actions within the poles, which among others would include the regional representatives of the subsidiary agencies.

make sure that the actions of the other ministerial departments are coordinated with those of rural development on the sites.

head regionl planning committees.

coordinate the inter-regional action programs by maintaining horizontal exchanges and advisory relations among neighboring poles.

remain in permanent contact with the regional policy makers.

2.2.2.2.5. The case of Artisanal, Inland and Marine Fishery

From the viewpoint of the institutional framework, it is proposed that the same plan described above for the Basic rural activities (agriculture and livestock) be applied here. However, as indicated in the case of Option A, it would be necessary

to integrate inland fisheries with rural development, given its possibilities of being integrated with irrigated agriculture after the Senegal River region has been developed. Such integration would be imperative in the framework of that option (Option B) in light of the orientations assigned to it and the approach defined for it. Given these requirements, mainland and marine fisheries will be discussed desperately.

2.2.2.5.1. Inland Fisheries

Along the same lines as the proposals made for the rural activities, it is proposed that the potential development sites be managed in the same manner as described in Ch. 2.1. That way, any possibility related to inland fishing would be examined as a component of the development guidelines proposed for the sites in question. The overall scheme could thereby include inland fisheries with no problem, by means of a few adjustments, which are summarized as follows:

* In the area of training, the agents at the sites would have to be capable of lending a hand in inland fishing, so their training should cover many areas. For this reason, it is proposed that an inland fishing section be introduced in the training programs for agents desti to staff the sites and who would be B-level agents (moniteurs) or C-level agents (conducteur de travaux) trained at the ENFVA in Kaedi.

* As concerns managerial staff at the regional poles, it would be necessary to have a high level technician specialized in inland fishing (assistant engineer or engineer) who would belong to the pole's multi-disciplinary team and act as advisor for anything concerning inland fishing (training, refresher courses, research development programs, etc.).

* In the rural production division, assign additional duties to:

  - the rural institutions office by putting it in charge of problems related to mainland water utilization.

  - the resource office by adding to it a new section dealing with fishing resources in mainland waters.

- In the environmental protection subdivision, create an inland fishery service or division.

- In the central support office for research, extension and training: expand its field of activity in these areas and include fisheries. With that in mind, the following are proposed:

  - expanding training sections at ENFVA to include inland fisheries and pisciculture

  - creating a research section on inland fisheries at the CNRADA.

  - endowing the research division with high level specialized technicians.

- At the international level: set up an advisory committee in collaboration with competent authorities in the field of inland fisheries in countries sharing the Senegal River. This committee should study problems related to the use and control of fishing zones as well as issues connected with research and experimentation in that area. The committee should collaborate with the rural production division, the research division, the coordinating unit for rural development and the regional poles located along the river, and eventually other poles where inland fishing could be developed in ponds, etc.

2.2.2.5.2. Artisanal Marine Fisheries

Artisanal marine fisheries will continue to be under the Fisheries Department, which is a part of the Ministry of Fisheries and Maritime Economy. The general plan suggested earlier for rural activities but with more emphasis on integration should be used as the institutional framework in this sector.

Community development of the potential development sites:

Community development should go through the 3 stages described earlier (Cf. Ch. 2.1). However, given on the one hand the very special problems of the coastal areas where thes activity irredominates (isolation, inaccessibility, absence of any infrastructure whatsoever, etc.) and on the other hand, the development

potential they could offer in developing the countryside (tourism), it would be necessary to give particular emphasis to the aspects of integration; that is, not only would socio-economic factors (infrastructures, roads, etc.) and socio-cultural factors, (education, health, etc,) have to be integrated with coastal fishing development efforts, but also other aspects of developing tourism. The integration of these latter components should have economic goals and be carried out in such a fashion that the local people not be turned away from its productive activities in favor of parasitic and alienating activities which could result from the development of tourism. In general, community development of 8 sights is proposed including:

- 4 sites on the coast between Nouakchott and Nouadhibou grouping together about a dozen Imraguen encampments. These 4 sites would be located in the Tioulit and Tinaloul camps.

  1 site in Nouadhibou (Baie du Levrier)

  1 site in Nouakchott

  1 site on the southern coast, near Keur Macene.

  1 site south of Nouakchott, midway between Nouakchott and Rosso, near the main road along the part closest to the coast. Development of the first 6 sites, some of which are already the scene of activity (Japanese project, FAO project) could be activated right now, while the last 2 should be considered as potential sites due to the fact that they are in very sparsely populated coastal zones, and would consequently require a steady influx of population.

* Adaptation of the supervisory organizations to new needs:

Community development in the proposed sites requires changes at the level of supervisory institutions in order to adapt them to new needs. These changes would be:

- the establishment of regional centers or poles for the development of coastal fishing. In the same fashion as the poles proposed for rural development, these poles should contribute to studying possibilities for developing these sites, propose integrated development programs and handle their follow-up and supervision. They should be directed by a team of

specialists in artisanal fishing, integrated development or planning, training, etc. It is thereby proposed that three regional development poles be set up as a first step and a fourth pole at a later stage. The first three would be located in Nouadhibou, in Tinaloul(between Nouakchott and Nouadhibou) and in Nouakchott; the fourth would be located south of Nouakchott - it should be located in an area with the greatest potential and presenting the fewest problems for development and management.

- The establishment of a central support office for oceanographic research and training (a division or department) in order to intensify activities in these fields. This support office should have the same duties in marine fisheries as those of the central office for research, extension and training of MDR managerial staff for rural activities. It should also direct the research and training institutions for fisheries.

As for the research and training institutions, there are the National Center for Oceanographic Research and Fisheries and the National Center for Maritime Career Training.

The latter centers should be strengthened so that they can meet changing demands. In the area of research, it would be fitting to create a research division for fishing techniques and equipment. This sector would work closely with the national fisheries office in experimenting with new equipment and techniques and improving existing equipment and techniques which would later be diffused and popularized, etc.

In the area of training it would be fitting to create a training unit or section for community development agents working on the sites and for mid-level cadres (upper-level technicians). This unit would utilize the existing infrastructures at the Mamadou Toure Vocational Training Center and at the National Oceanographic Research Center of Nouadhibou. Teaching would be done a small permanent teaching corps which would coordinate studies and by some scientists and teachers from existing institutions.

- The establishment of specialized offices at the central level which would be attached to the Fishing Division. These offices would be:

- A fishing resources office, which should survey the fishing regions and their characteristics, fish species, their dynamics, their movements, their rate of utilization, etc. The first inventory should be made based on existing information from various studies and later completed by further studies and research to be requested of the Oceanographic Research Center or sub-contracted to specialists. This inventory should be kept up to date with statistical censuses which would be conducted by the Fisheries Department. On the basis of this multi-dimensional survey, this office should determine the utilization standards for the different fishing zones and for the different species (fishing season, features of the tackles, etc.)

- A legal office, which should focus on problems connected with the application of rules governing the utilization of territorial waters and focus on those connected with producer organizations, their legal statutes and their responsibilities.

- A statistics office which would be in charge of marine statistics and of prices for fish products.

In addition to these 3 offices, the creation of a documentation section would be necessary, in which all documentation concerning marine fishing would be centralized.

- The establishment of coordinating units for coastal development. These cells should be installed at the regional pole level and would be supervised by a central unit. Their roles in the development of coastal fishing would be the same as those of the rural development coordinating cells described earlier.

- The establishment of a planning, and design office serving marine fisheries development. Just as for the MDR. This office would fortify the fishery division's capabilities in design and research and would work closely with the central coordinating unit. Its duties would be the same as those of the design and planning office proposed for the MDR structures.

2.2.2.2.6. Integration of the Subsidiary Agencies into the Proposed Plan

It should be fairly easy to integrate the sister institutions connected with the agencies attached to the MDR, especially those which have regional branches and infrastructures. Such an integration would be capable of:

coordinating the efforts of the different institutions; in various areas (supervision, research, extension work etc.)

economizing these efforts and avoiding any duplication of duties and confusion,

homogenizing the approach to rural development problems, and

allowing equitable participation by the various institutions in the national development effort.

This chiefly involves SONADER, the OMC and the Fisheries Office, which was just created. A brief discussion of how the agencies could be integrated follows:

2.2.2.2.6.1. SONADER

As pointed out in Ch. 2.1.4.2., the irrigated agricultural development projects under SONADER management and supervision could be organized on the development sites; the same holds for future development. The sites should be jointly managed by SONADER and the MDR. Community development agents on the sites, who would be sponsored by SONADER, should collaborate closely through SONADER's regional representatives with the regional development pole (or center) concerned and the MDR coordinating unit. The main focus of this collaboration should be on:

- research, extension and training policies;
- the methods of evaluating and adjusting that policy;
- the types of producer's associations on the irrigated plots;
- preparing the social groundwork for future irrigated agricultural development of the sites.

Moreover, SONADER's policy during the 4th National Plan with regard to training, extension and community outreach activities on irrigated plots, which have just been defined by the Development and Production Department (DVMP - la Direction de la mise en valeur et de la production) (1) seems to fit in well with such integration. Furthermore, it seems that without such integration, which naturally assumes the prior installation of the global organization being described ; this policy would have only minor impact.

2.2.2.2.6.2. SONICOB

This company seems to be barely surviving. In order to integrate it into the proposed plan and to get it to participate in the development objectives of the nation, which is primarily its raison d'etre, it must be rehabilitated, if only gradually. In a first stage, it is possible to conceive of relatively limited actions such as collecting animals for butchering, and distributing livestock feed or other uses during the "lean periods."

Such activities could be carried out by setting up low cost "waiting post" or waiting ranches throughout the major herding zones or along the main transhumant trek routes. At a later stage, SONICOB could become involved in running particular sites, mainly in pastoral zones.

2.2.2.2.6.2. The OMC

Although the OMC is not part of the Ministry of Rural Development, it is worth studying in some detail because of the economic importance of its sphere of activities. At present, the OMC is under the control of the CAA, which is itself attached to the Presidency; its role is limited to distributing donated food, which is a very passive role for an institution that is supposed to be linked to the rural development process. Given the situation of Mauritania and the production goals that the rural sector must meet, particularly in the context of the nutritional strategy, it is imperative that the OMC play a more active role in development. This would involve

- allowing the OMC to play the roles which were prescribed in the laws that create it,

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(1) Politique de formation, de vulgarisation et d'animation sur les perimetres irriguees-SONADER - DMVP - April, 1981.

- involving it more directly in the development process by eventually giving it another role to play in addition to its post-harvest role. This new role would involve the delivery of inputs to the various agricultural areas, died on supervised credit, etc. as required by the need to promote grain production and thus having a major impact on crop yields.

All of the above underline the need to integrate the OMC with the rural development structures. Possible constraints on its means for becoming involved could be bypassed by actions which would consolidate its structures, passing most notably through institutionalized credit.

So, the OMC's effectiveness as an institution serving development could be increased and the OMC could be instrumental in supervising potential grain-oriented development sites(rainfed agricultural zone, the Senegal River region, etc.).

2.2.2.2.6.4. The National Fisheries Office

The National Fisheries Office was just recently established and is not yet operational. In theory, it is a commercial and industrial organization which works on promoting any activity related to ocean fishing in general.

As for its integration with the proposed plan, just as for the MDR intervention agencies, this organization should collaborate actively with the administrative institutions in community development and preparation of coastal development sites.

Its main concerns should be:

- to develop an interest among the fishing population in the advantages of organization;
- the types of fishermens' organizations
- to advise the fishermen about choosing among different types of motors and equipment;
- to supply already existing fishermen groups with supplies and other inputs;
- to help market fishing products at profitable prices;

- to channel credit operations;

- to prepare land for the eventual creation of new fishing villages.

- integrated development of the sites.

Thus, the National Fisheries Office would be called upon to be represented in the regional poles and to have a well-qualified team of specialists at the central level.

2.2.2.3. The Adaptation of Production Systems to Needs

This component is warranted by the necessity of valorizing the proposed changes in the rural development structures in the best possible way. Indeed, the objective assigned to such changes is primarily to reach a certain stage of development in the rural sector within a given time, through the animation and development of the production systems. However, this supposes that the production systems are capable of accepting and anticipating such changes if, for example, it is a question of a new and relatively intensive technology which is supposedly accepted by the producers, the following would be necessary:

- on one hand, the producers would have to be able to have the additional production required by that technology, notably notably in inputs and equipments;

- and on the other hand, the economic results would have to be encouraging, encouraging producers to repeat the efforts.

But it so happens that under the present circumstances, these conditions are far from being satisfied, as are a certain number of preliminary measures aimed at remedying this situation. Two principal measures should be considered in this regard:

- the first bears on the organization of the producers and of the systems of production;

- the second bears on the "impetus"or"forward movements" that the state should induce in the systems of production by means of a credit and price policy in order to push them in the desired direction.

2.2.2.3.1. Organizing the Producers:

The rural populations' participation in reaching development objectives should be sought in their willingness to rally around the only special interest they hold in common, that of their own development.

Hence, any possibility of organizing the producers should be sought after and encouraged, first on the development sites and in a later stage on all of the sites in one or several regions. The focus of interest of such organizations should center chiefly around pre- and post- production activities.

In addition, every possibility or form of organization should be considered from the dynamic perspective of development and conform to a certain set of criteria which would be defined by the legal office of the Rural Production Department and by the Fisheries Department's legal office.

In this regard, lessons should be learned from the cooperative experiences of the 60's and from present-day experiences, notably concerning the organization of irrigated village plots supervised by SONADER and the fishing cooperatives supervised by the FAO project and the Japanese project. In this respect, collaboration among the different institutions assigned to keep in touch with producer's organizations should be solicited.

2.2.2.3.2. The Establishment of a Central Cooperative Group of Rural Services

This institution is justified by the fact that certain regions cannot derive any benefit from the actions of the subsidiary agencies, at least not in the medium term. The cooperative group would be placed under the direction of the MDR. Capital for this cooperative would be built up as follows:

an endowment from the state;

pre-fixed contributions from the regions concerned, which would be taken out of the regional budgets;

a contribution from the local producer's organization benefiting from this cooperative services.

It should also have branches in participating regions which would become regional rural service cooperatives.

The role of this cooperative group and its branches would be:

- to be responsible for a certain number of services which the local groupings and organizations cannot handle separately;

, to coordinate the activities of the local organizations, notably regarding infrastructures, storage or processing of agricultural products.

At the central level, the cooperative group would centralize the input requests and make sure they were acquired under the best economic and financial terms; likewise, it would have to manage product collection by regional cooperatives and see that they were sold under the same conditions.

For their part, the regional cooperatives would be responsible for:

dispatching products collected at the regional level to the large consumer centers;

certain operations requiring immediate attention such as sorting, packaging, etc.

forwarding inputs to the regions.

Of course, these operations would take place under the supervision and scrutiny of the head cooperative group.

2.2.2.3.3.3 Credit and Price Policy

The situation of the rural sector has long been marked by a striking paradox, which is the lack of a specialized financial institution for rural development or of a well-defined price policy, though in truth, this sector is the most vital by far, especially because of the population it employs and because of the socio-economic nature of its productive activities.

The recent establishment of the National Development Fund, which should include a farming credit fund among other things, should in theory remedy this situation.

Granted that to date nothing has been defined concerning the operation of this future system of credit, it would be well to call attention to a number of facts which have been left out in past and present experiments in the area of credit. Actually, two credit operations have been identified in Mauritania.

The first was the draft farming credit, which was set up during the 1960's and "whose results were very satisfactory on the human level, appreciable on the management level, mediocre and actually catastrophic on the financial and economic levels." (1)

In other words, the operation was doomed to failure. The reasons for this were:

production rose considerably.

annuity payments for loans made to the farmers were too heavy.

millet sold very poorly because of a slump in prices and competition from Malian millet.

- The second operation is the one now being executed by SONADER covering irrigated farming on small village plots and in large fields it supervises. The results of this operation are nearly identical to those of the first operation. The reasons are:

  - The rice policy now being applied does not permit the farmers to earn sufficient income from their harvests to fulfill their needs and pay back loans.

  - The farmers who can plant more lucrative crops (tomatoes, vegetables, etc.) risk being unable to dispose of their produce due to the lack of resources and of marketing structures.

All of these problems raise a number of questions. If SONADER with all of its logistical and personnel resources and its relative command of production techniques has not succeeded in guaranteeing the total recovery of the loans it has extended, what would happen with the farming credit fund?

In short these examples contain many interrelated problems of credit, prices and marketing.

BDPA : 1967 - 1975.

For that reason, within the framework of this choice and in order to transcend these problems, it is proposed that actions in this area be linked together or integrated with one another. Every credit operation should be seen as having to be regulated by a system of multilateral contracts simultaneously involving the credit institution, the producers' organizations and the para-statal agencies, in the following manner: Once loans have been granted to the producers, a multilateral agreement should be made as follows:

According to the nature of the operation for which credit has been solicited (), (the para-statal agency) should commit itself to supplying the producers with the equivalent of the credit amount in kind (services, inputs etc.) and within the agreed-upon time, to repurchasing the product or guaranteeing their sale at the end of the season at guaranteed profit-making prices and to paying back the loan on time; (ii) the producers should commit themselves to paying back their loan within the stipulated period by selling part of or all of their products to the para-statal agency. (iii) For its part, the credit institution should pledge to extend credit to the para-statal agencies within the agreed upon time. (iv) Finally the managerial personnel at the site level should commit themselves to fully carrying out the technical supervision of the operations for which the loan was granted. Of course, such a scheme supposes:

- The existence of standardized regulations governing the granting and utilization of loans. In that regard, a National Commission for Agricultural Credit must be established before hand, which would prepare these regulations and make sure they were kept up to date and adjusted in compliance with current problems and agricultural policy. This commission should be attached to the MDR and would meet once a year. The bureau of planning and design, the rural production division, the regional development poles, the subsidiary agencies and the credit institutions would be represented on this commission.

As for applications for credit, they could conceivably be studied at the site level by the local management; approval should be given by authorities at the regional pole or center level.

The preliminary fixing of prices for inputs and products at the start of every season, which could be studied by a national price commission. This commission would meet once a year under the patronage of the Central Planning Office in the Ministry of Economy and Finance. All departments and institutions concerned would be represented on it.

2.2.2.2. Establishment of Development Planning Committees

These committees are warranted by the need to maintain an on-going discussion of the problems of rural development and by the need to make reasonable selections of priorities. They should be established on two levels:

- On the Central Level: The National Rural Development Committee groups together all regional and central authorities of the MDR and representatives from other ministerial departments. This committee would be directed by permanent members attached to the coordination unit. It would have to meet once a year to study the progress of the achievements of the Plan and problems which come up and suggest any useful measures for readjusting the development programs. On the eve of every 5-year plan, preparatory meetings should be held to conduct analyses in retrospect and begin drafting the next plan before submitting it to the Central Planning Office within the Ministry of Economy and Finance or to the coordinating committee.

- At the Regional Level: The Regional Rural Development committees modeled after the Central Committee, should get together the regional representatives of the development poles, the site directors and the governor of the region. This committee would be headed by the regional coordinating unit and would meet in the same manner as the Central Committee, but one month ahead of it.

2.2.2.3. Artisanal Fisheries

Given the socio-economic importance that artisanal fisheries will take on and the special nature of its problems, it would be necessary to divide the present planning committee for fishery into 4 sub-committees:

- a sub-committee for industrial fishing (for the record)

- a sub-committee for fishing technology, in which Artisanal Fisheries and the Fishery Office would also be represented, among others.

- a research and training sub-committee in which Artisanal Fishery and the Fisheries Office would also be represented.

- a sub-committee for artisanal or coastal fishing which would group together the central artisanal fisheries authorities and the fisheries office, the authorities of the regional poles and those of the Fisheries Department (resource office and legal office.)

These sub-committees would proceed in the same way as the committees defined for rural development, but would have to submit the results of their deliberations to the Planning Committee, via the Marine Fisheries Office, which would coordinate them.

2.2.2.4. Establishment of a National Research Committee or Council

This committee or council is warranted by the need to integrate research with real problems of the rural sector and to adapt it to the development objectives. Its members should include the central and regional MDR authorities, its subsidiary agencies and the research and training institutes in order to define priorities in the area of research and the way in which research achievements should be integrated into extension work and training. This council would be headed by the Research Extension and Managerial Personnel Training Department and meet once a year to review the situation and design future programs.

2.2.2.5. Rearrangement of the Salary System for Management, Training and Research Personnel

This arrangement should consist of setting up differential bonuses for employees assigned to fieldwork and to the research and training institutions. With this in mind, the following is proposed:

- For all agents working in either the interior or in training or research institutions, a differential bonus varying between 10% and 12% of the annual salary according to their productivity.

- A non-housing allowance for agents and supervisors not housed on the sites, at about 15,000 UM per year.

2.2.3. Assessment of the Option

The implementation of this option requires mobilizing a certain amount of human and financial resources which are broken down as follows:

2.2.3.1. Assessment of Human Resource Requirements

2.2.3.1.1. Requirements at the Site Level

Personnel needs on the sites should depend on the importance of the site itself; in other words, they should depend on the size of the project on the nature of the project activities and on the size of the population which would be affected by the project. But on the whole, the requirements could be assessed as follows for each site:

- 1 or several supervisory agents (B or C level rural development agents according to the size of the site's population. There could be 1 agent for 150 - 300 actively employed persons, depending on the activities of the populations and how widely scattered they were. These agents would be in charge of extension work and follow-up on the site, meanwhile maintaining a file on producers. In the case of a new site, they would be responsible for making observations and collecting the necessary information for setting up baseline studies of the site. On the whole, there would be an average of 5 agents per site. A site could constitute one or several neighboring villages.

- 1 middle level specialist of the caliber of assistant engineer or top technician for every 4 to 6 agents, depending on the extent to which the population is scattered about on the site. This technician should (i) supervise the extension agents and give them technical support; (ii) study the credit applications; (iii) keep a file on extension activities; (iv) record problems which crop up (v) maintain contact with the regional pole.

These two types of agents must be trained in several areas and be well-versed in communication techniques and methods. They should be selected on the basis of well-defined criteria (competence, personality, etc.). They would be required to live permanently on the site, to maintain good relations with the population and develop an exemplary image of their position. As much as possible, these agents should be recruited locally, receive the required training and then return to the local area of work. It would also be necessary to provide them with material incentives, by means of their salaries as well as their working and living conditions, which

should be offered to them on the site (housing, utilities, offices, non-housing allowances for agents originally from the site areas, etc.).

. 0.25 site director, who would be a top level agro-economist. This person should be capable of supervising 4 sites. He would be required to travel constantly and the regional pole would be his home base, where he would collaborate with his specialist colleagues in diverse technical fields in designing integrated development programs.

In addition, he would arrange joint visits to the different sites in the company of the various specialists from the poles and other departments. He would also be expected to study the site's problems in credit, marketing and supplies and suggest the necessary measures to be taken at the pole level as well as at the site level.

Moreover, in the case of sites where certain subsidiary agencies are involved and in cases where the sites already have an institutional framework set up (projects) in principle, their needs are the same, but a formula of collaboration with the MDR remains to be defined. One could propose that the agents on the site itself be taken from the MDR and reassigned to the agency or project involved in developing the site. The top manager would remain attached to the MDR and would also work in collaboration with the regional office of the agency in question or with the project director. This formula could increase the chances of having the isolated projects succeed, especially since some of them have been rather poorly defined and were not based on preliminary baseline studies (example: the USAID oasis project; the livestock project in Kankossa financed by the Dutch; the FAC project for animal-draft cultivation, etc.)

125 sites have been broken down as follows:

- 18 sites corresponding to the existing projects mentioned above, 7 of which are part of the project for 36 wells.
- 40 sites corresponding to existing and potential irrigated village plots supervised by SONADER or other institutions.
- 61 potential sites to be created between now and the year 2000. This would involve projects in the various

regions: the river region (irrigation, inland fishing), the southeast rainfall zone, the oasis and recessional zones, the coastal zone between Nouadhibou and Nouakchott (artisanal marine fishing).

This is not a set number, but could be adjusted to available means; however, the choice of potential development sites should take into account the socio-economic importance of the different regions and zones and a harmonious distribution, geographically speaking.

2.2.3.1.2. Requirements of the Regional Poles or Centers of Rural Development

In addition to the agro-economist mentioned earlier, it would be necessary to bring a multi-purpose team specializing in the major regional activities. The size of the team would be a function of the economic importance of each activity.

In the most general case, the make-up of the team could be as follows:

- 1 team leader, director of the pole and the regional coordinating unit. He should be the most experienced member (agronomist, economist or agricultural planner). His role would be to (i) supervise and direct the entire team; (ii) centralize all information concerning programming and control, etc.; (iii) meet with the regional committee of rural development; (iv) represent the region on the National Committees (of rural development and of research) (v) direct the regional coordinating unit by keeping alive the pole's relations with the central administration, the credit institution, the subsidiary agencies and other ministerial departments in the region and with the territorial administration; (vi) call upon the regional specialized offices (Planning and Design Office, Soils Office, etc.) as needed; (vii) give opinions about the credit applications in consultation with the concerned members on the team and act as head coordinator of the poles.

The team leader should be assisted by:

1 administrative assistant

1 assistant statistician

1 or several agricultural specialists

1 or several livestock specialists

1 animal health specialist

1 agricultural engineer

1 environmental specialist

1 extension and training specialist

The professional levels of the different specialists should be engineer or assistant engineer, veterinarian or assistant veterinarian or according to how much an activity is represented in the region. They should be able to formulate and study any technical problems which come up in the region, otherwise submit them to the central office. Consequently, they would be required to stay in constant contact with the central administration, to supervise all research activity in the region, to participate in training the farmers and extension agents and participate in perfecting, monitoring and evaluating the development programs.

Potential needs could be defined as follows, a priori:

12 development pole and coordination unit directors.

12 top-level specialists in extension work and training.

36 top-level specialists in diverse technical fields (agriculture, livestock, animal health, crop protection, agricultural engineering, environment), or an average of 3 specialists per region.

60 middle-ranking specialists (associate and assistant engineers) in diverse technical fields, or an average of of 5 specialists per region.

To those needs must be added the personnel requirements of the research stations or units and of the training and improvement centers yet to be created, which can be assessed as follows:

- research station: 1 assistant agro-economist assisted by 2 B-level agents (moniteurs) and 3 workers (for the record)

- training center: 1 manager who would be both director and teacher, assisted by 2 specialized assistant engineers, 1 moniteur and 4 workers. Teaching would be done by the director, the 2 assistant engineers and by different specialists from the regional development center or pole requested to give special courses.

2.2.3.1.3. Requirements at the Central Level

2.2.3.1.3.1. Rural Production Department or Division

- Administrative Office

1 administrative manager, agricultural planner.

1 assistant manager, agronomist or agro-economist.

1 statistician to head the statistics bureau, assigned by 1 statistician and 2 assistant engineers.

1 environmentalist to head the resources office, assisted by 4 specialists for the different sections : soils, forests and grazing lands and hydraulics, who should each be assisted by 2 assistant engineers, 1 cartographer, 1 middle-ranking photo - interpreter and 4 draftsmen (supervisor level).

1 specialist in rural institutions to head the legal office and assisted by a lawyer, a socio-economist and a field action team of 2 assistant engineers and 6 supervisors.

1 middle-ranking documentalist to head the documentation section.

- Agricultural Division

1 agricultural director, an agro-economist.

4 agronomists specialized in traditional farming, irrigated farming, oasis farming and crop protection.

8 assistant engineers to assist the specialists.

- Animal Husbandry Division

1 animal husbandry director, a zootechnician

2 zootechnicians

1 veterinary doctor

6 assistant engineers and livestock assistants to assist the different specialists.

- Environmental Protection Division

1 director , an environmentalist.

2 forestry experts responsible for utilization and control

5 assistant engineers of B-level agents (conducteurs) to assist the entire group.

- Agricultural Engineering and Agricultural Hydraulics Division

1 director, a hydraulics engineer.

3 top-level specialists in dams and water and soil conservation (hydrology), irrigation and agricultural mechanization (agricultural engineers).

8 middle-ranking specialists to assist the director and the 3 other specialists.

2.2.3.1.3.2. Division of Research and Extension

1 director, an agronomist.

1 head of research

1 head of training

1 head of the extension servcie

1 head of studies and assessment

1 head of designing and mass media

1 coordinator

3 works engineers to reinforce certain sections.

All of this personnel should be top-ranking and would be assisted by:

. 15 or so specialists of the assistant engineer level and

. about 20 supervisory (B and C-level) agent and training staff members should be added. This is the personnel required to manage the new proposed sections, to fortify certain existing sections and to replace expatriate researchers and teachers with nationals.

These requirements are:

- 4 specialists heading the sections: CES, mechanization, oasis and rural development, assisted by 4 assistant engineers, 6 supervisors and 8 workers.

- 12 researchers to replace the expatriate researchers

2.2.3.1.4. Requirements of the Planning and Design Office

The office would require:

1 director, an agro-economist

1 economist, an options planner

1 agro-economist

1 zootechnician

1 agronomist

1 sociologist

1 agricultural engineer

All of these staff members should be top-ranking specialists; with extensive training in agricultural studies and in technical and economic project analysis. They should be assisted by a dozen or so middle-ranking specialists and by supervisors in various fields.

2.2.3.1.3.5. Coordinating Unit Requirements

The coordinating unit should be directed by a top-ranking dynamic manager, a development economist by training. He should be assisted by another top manager who is vigilant and very diplomatic, of the socio-economist or economist type.

2.2.3.1.3.6. Requirements of the Subsidiary Agencies

The needs of the subsidiary agencies on the sites are in theory included in the requirements estimated earlier for the sites.

At the regional level, these requirements would depend on the presence or absence of actions in each region. It appears that from a quantitative viewpoint, the present managerial staff at the central and regional level, notably for SONADER and the OMC (including the expatriates) could suffer in the middle term, except SONICOB, which should start by removing some staff from the MDR. The same should hold for the rural services cooperatives proposed in Chapter 2.3.2.

2.2.3.1.4 Requirements of the Artisanal Fishery Sector:

2.2.3.1.4.1. Requirements of the Sites: The requirements of the sites have been assessed as follows:

- 2-3 community development agents at the B (moniteur) or C(conducteur) level trained in artisanal fishing. These agents would be in charge of extension work and follow-up on the site, with an average of 1 agent designed to 150 to 200 fishermen.

- 1 supervisor at the assistant engineer or expert technician level trained in fishing, 1 for every 2 sites, This agent would play the same roles as his counterpart in rural development.

- 1 skilled mechanic per site and one assistant worker.

These last two agents would be paid by the Fisheries Office at first and later by fishermen's groups.

- 1 socio-economist--director for all sites belonging to the same pole, who would have the same duties as the agro-economist for the rural development sites.

In all, the potential needs of the proposed sites would be:

20 community development agents

4 middle-ranking supervisors

4 middle-ranking socio-economists.

2.2.3.1.4.2 Requirements of the Regional Poles. For each pole:

1 team leader and director of the pole and of the coordination unit who is a fishery economist or equivalent.

1 administrative assistant.

1 assistant statistician

1 artisanal fishery specialist

1 representative from the Fisheries Office (middle-ranking manager), seconded by a 1 assistant C or B level).

2 inspectors (C level).

2.2.3.1.4.3. Requirements at the Central Level

* Central Support Office of Research and Training

1 head of research, fisheries engineer.

1 head of post-secondary training.

3 middle-ranking assistants

* Oceanographic Center of Nouadhibou : Artisanal Fisheries Section.

1 fishing techniques engineer.

1 middle-ranking assistant (assistant engineer)

2 assistants; B or C level.

4 fishermen-workers

- Training Units for Animation Agents and Middle-Ranking Personnel

2 permanent teachers (fisheries engineer, fishing techniques engineer, etc.

2 middle-ranking assistants.

3 professional fishermen or master fishermen

* Fisheries Department

- Resources Office

1 engineer, a specialist in population dynamics.

2 middle-ranking assistants.

- Legal Office

1 lawyer.

1 sociologist

2 assistants C (conducteur) level.

- Statistical Bureau

1 statistics engineer.

2 assistant engineers.

- Documentation Section

1 middle-ranking documentalist

- Coordinating Unit

1 socio-economist, unit director

1 socio-economist or equivalent, coordinator of the regional unit.

* Planning and Design Office

1 office director, specialized in economic planning or a related field

1 fishing techniques specialist.

1 fishing technologist

1 marine biologist or oceanographer

1 polytechnician

6 middle-ranking assistants

4 assistants; B or C level.

* National Fisheries Office

1 specialist in marketing fish products.

1 credit specialist (post-secondary training)

1 middle-ranking sales representative

1 fishing expert in charge of procuring inputs and supplies.

2.2.3.1.5. Summary of the Human Resources Requirements for Option B

Table 9 below summarizes the potential requirements in personnel for all of the MDR structures.

These needs could be modified in one way or another by changing the number of sites and their size.

So, taking into account current availability of personnel, which is shown below (1) for all of the MDR structures except the OMC(2) and for artisanal fishing (Fisheries Department)

* MDR

30 top level personnel

54 middle-level personnel

240 operating level personnel

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(1) Based on the draft report of the Planning Committee for Rural Development

(2) At present (1981), the OMC is staffed by 100 or so agents, of whom only 5 have had senior training.

Table 9: Summary of Human Resources Requirements for Rural Development and Artisanal Fisheries

Institution/Training Level	Top Level		Mobile Level		Operating Level		Worker	
	MRD	Fish-eries	MRD	Fish-eries	MRD	Fish-eries	MRD	Fisheries
Development Sites	31	4	125	4	625	36	-	8
Regional Poles								
- Research & Training	3		23		17		33	
- Supervision	60	8	64	12	-	12	-	
Central Structures								
- Rural Production Fisheries	31	4	40	7	10	2	-	
- Planning and Design Office, Coordination	12	8	5	7	5	4	-	
- Research, Extension, Training	13	2	16	3	20		-	
Para-Statal Organizations		3		5				
Training and Research Institutions	24	3	4	3	6	5	8	44
Totals	174	32	277	40	683	59	41	12

* MRD : Ministry of Rural Development.

Artisanal Fishing

6 top-level

8 middle- ranking level

2 supervisors.

and accounting for a 3.3% annual renewal rate (3) and supposing that this personnel would be completely available by 1990, the real requirements in the year 2000 would be:

194 top level personnel for the MDR and 35 for fisheries.

300 middle-level personnel for the MDR and 43 for fisheries.

598 supervisors for the MDR and 77 for fisheries.

2.2.3.2. Assessment of Financial Resource Requirements

2.2.3.2.1. Training Costs

These costs were estimated at 1980 prices from the primary school costs established by the RAMS project (4) and which suppose:

- 3 years of training at ENFVA-Kaedi for supervisors (conducteurs and moniteurs)
- 2 and 5 years of training abroad (gratis) for middle-ranking and top-ranking personnel, respectively.
- 2 to 3 years of training in Nouadhibou for middle-level agents and workers in fishing.

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(3) Assumes that each agent works an average of 30 years in the service.

(4) RAMS report on Formal Education, 1980

Table 10: Evaluation of Training Costs for Option B

	No. to be Trained	Primary and Secondary Education	ENFVA/Educ. Unit Nouad-hibou	Higher Educ. Abroad	Total
MDR					
Top level personnel	194	109	-	117	226
Middle level	300	169	-	65	234
Supervisors/field level	598	123	702	-	825
S/total		401	702	182	1,285
Artisanal Fisheries					
Top level	35	19	-	21	
Middle Level	43	24	-	10	
Supervisors/field level	77	16	90	-	200
S/total		79	90	31	200
Sub-Totals		480	792	213	1485

(Unit : Millions of UM 1980)

These costs can be broken down as follows among the different levels of personnel reasearch and training:

(in millions of UM, 1980)

	MDR	Artisanal Fisheries
Central supervisory level	129	50
Personnel training; Regional Supervisory level	147	50
Training, Extension Service at Site level	848	57
Research Extension Service Training	160	44

2.2.3.2.2. Costs of the New Structures

Essentially, this involves the costs of placing managerial staff on the sites and in the research sections and training centers, and the costs of the buildings, and means of transport. These infrastructures include housing, laboratories, classrooms, storerooms, etc.

2.2.3.2.2.1. MDR Structures

* Central Administrative Units:

. Equipped offices at 100 000 UM per new agent.

. 15 all terrain vehicles for all the MDR central units at a cost of 650 000 UM per unit

or a total cost of 25 million UM.

* Regional Development Poles:

. Equipped offices at 100 000 per new agent.

. 3 all-terrain vehicles per pole at a cost of 650 000 UM per unit or

a total of 40 million UM for the 12 poles.

* For the sites, since the agents and supervisors would be obliged to live on the site itself, each site should equipped as follows:

- 6 houses for the agent and supervisors
- 5 small offices adjoined to 4 small warehouses for extension equipment and inputs.
- 1 office for the supervisor joined to guest quarters for the site coordinator
- a means of transportation for the supervisor a priori for 50% of the agents who would be required to keep in contact with several small villages.

Given that in only 40% of the cases will the agents and extension agents be recruited locally, the needs on the sites could be assessed as follows:

-	2-room dwelling and outbuildings (x 3,6)	1080 000 UM
-	agents' offices and warehouses (x 5)	1000 000 UM
-	supervisor's office and guest house (x 1)	250 000 UM
-	means of transportation (x 3,6)	90 000 UM

or a total of 2 420 000 UM. However, for agents and supervisors not receiving housing a non-housing allowance should be provided. We suggest that this allowance be 150 000 UM/year for agents and supervisors.

Hence, on the basis of 125 potential sites, all of the equipment can be estimated to cost 302.5 million UM at 1980 prices.

* For the research stations and training centers, requirements have been assessed as follows:

- Research Station:

3 dwellings for the station director and the 2 monitors at a total cost of	900 000 UM
1 office and guest quarters for	250 000 UM
1 small laboratory adjoined to the office	100 000 UM
1 storeroom	100 000 UM
total laboratory equipment(weighing equipment dosage equipment, refrigeration, camera, etc.)	100 000 UM
a simple means of transportation for the station director	25 000 UM

or a total cost of 1 475 000 UM per station and 8 850 000 UM for the 6 proposed stations. These costs could be reduced by hiring the personnel at the site level who are from the zones in which the sites are set up.

Training Centers

1 dwelling for the director	500 000 UM
2 dwellings for the other 2 teachers	600 000 UM
1 office complex (4 offices)	400 000 UM
1 guest house	300 000 UM
1 kitchen and dining hall(50 persons)	750 000 UM
1 small warehouse for equipment; also a workshop	500 000 UM
1 50- bed dormitory	2 000 000 UM
audio-visual equipment	250 000 UM
agricultural equipment	1 000 000 UM

or a total of 7 600 000 UM per center and 22 000 000 UM for the 3 centers.

2.2.3.2.2.2. Artisanal Fisheries

* Central Units

equipped offices (100 000 UM/agent)

5 all-terrain service vehicles for all the units at 650 000 per unit

or 5.25 million UM in all.

* Regional Poles

a housing complex comprising 9 dwellings (including one for the director) for each pole at a total cost of 3 million UM.

a group of offices for all of the pole's personnel and guest quarters for 1 million UM.

2 all-terrain service vehicles at 650 000 UM/unit

1 appropriate means of water-borne transportation for 500 000 UM

1 warehouse and workshop for 350 000 UM.

1 fuel reservoir and 1 pump for 100 000 UM

or a total of 6.25 million UM per pole and 25 million UM for the 4 proposed poles.

* Potential Development Sites :

40 dwellings for all of the community development agents supervisors, mechanic, carpenters at an average of 30,000 UM per unit

24 offices with guest quarters for the community development agents and supervisors for a total cost of 400 000 UM/unit.

24 small storerooms adjoined to the offices at a total cost of 100 000 UM per unit

8 machine shops and carpenter's shops at a cost of 350 000 UM per unit.

8 fuel reservoirs with annually-operated pumps at 100 000 UM per unit

20 motorized canoes for the community development agents at 800 000 per unit.

24 means of land transport at 25 000 UM per unit

or a total cost of 29,8 million UM for all of the sites.

* Unit for Training Community Development Agents and Middle-Ranking Personnel in Artisanal Fisheries

1 lecture hall for 500 000 UM

audio-visual equipment for 150 000 UM

1 practical workshop - 500 000 UM

motorized boats or canoes or other fishing craft of medium capacity for 5 million UM

or a total of 6.15 million UM.

* Artisanal Fishery Research Station

offices for 150 000 UM

workshop for 250 000 UM

medium-sized fishing boats for 500 000 UM

raw materials for 350 000 UM

or a total of 1.15 million UM.

2.2.3.2.3 Summary of the Cost of the New Organizational Units for Option B (Table 11)

Table 11 : Summary of Costs of New Units for Option B

(Millions of UM - 1980 prices)

	Rural Development	Artisanal Fisheries
National Level	25	5.25
Regional Poles	40	25
Sites	302.5	29.8
Research and Training	31.65	5.5
Totals	399.15	67.55

2.2.3.3 Operating Budget of the Proposed Units.

The operating budget is comprised of two types of expenses; the personnel salaries item and the equipment item. At present, 75% of the MDR budget (besides the dependent agencies) is allocated to the first and 25% to the second. Within the framework of the study, we are of the opinion that for a better operational efficiency of the proposed structures it would be imperative to increase that part of the budget set aside for equipment or working installations. We propose, therefore, that this part should equal at least 60% of the total salaries. This proposal remains valid for artisanal fishery as well.

On that basis and given the average 1980 salaries and the proposed arrangements for the salary system (Cf. Ch. 2.5) and accounting for a rate of advancement of 2.5% per annum, the operating cost of the proposed structures in the year of optimum performance could be assessed as shown in Table 12, not counting promotions.

Table 12 : Operating Budget for Option B in Year of Optimum Performance

(millions of UM in 1980 constant price)

	Rural Development	Artisanal Fisheries
Personnel Salary	217	26
Differential premiums	22	3
Equipment	130	15
Administration and Miscellaneous (10% of total)	37	4
Totals	406	48

2.2.3.4 Credit Requirements

Assessment of the credit fund was carried out in the following manner:

For rural development, it has been assumed that all of the workers affected by supervisory and extension services should benefit from loans, which would cover 75% of all expenses (investment and recurring costs). So, based on option B's production costs and allowing that at least 140 000(1) rural workers for 47% would be affected on all the sites, credit should cover about 35% of the Option Costs.

In artisanal fisheries it has been assumed that only 50% of the actively employed persons reached by supervisory services would benefit from a loan, which would cover 80% of production charges on the whole; supervised work would affect all gainfully-employed fishermen, who should be 4 600 strong in the year 2000.

So, credit needs would be established as follows:

(1) This figure was obtained on the basis of 225 workers per extension agent at the site level. The total number of agents being 625.

Table 13 : Credit Requirements for Option B

(Millions of UM 1980 prices)

Year	1985	1990	1995	2000
Credit Requirements				
Agriculture	356	630	886	1025
Livestock	99	137	139	127
Fisheries	283	91	60	60
Total	738	858	1085	1212

2.2.3.5. Summary of Financial Resources Required for Option B

Table 14 below summarizes the cost changes for the Option between 1982 and 2000. It is assumed that the option must be implemented progressively from 1980 up to the year 2000 (year of optimum performance).

Table 14 : Summary of Financial Resources Required for Option B.

(millions of UM in 1980 prices)

	1985	1990	1995	2000
Ministry of Rural Department				
Training	58.5	58.5	90	90
Equipment	15	15	25	25
Operation	224	284	345	406
Artisanal Fisheries				
Training	10	10	10	10
Equipment	3.5	3.5	3.5	3.5
Operation	15	26	37	48
Credit				
Agriculture	356	630	886	1025
Livestock	99	137	139	127
Fisheries	283	91	60	60
Sub-total Rural Development	725.5	1124.5	1485	1673
Sub-total Artisanal Fisheries	311.5	130.5	110.5	121.5
Grand Total	1037	2155	1595	1795

3.3. Option C

3.3.0 General

This option is oriented towards the continuation of the current policy concerning the institutional framework, along with all of its problems and shortcomings (Cf. Ch. 1)

From a static standpoint, the present institutional policy could be outlined as shown in Figure. Choosing such an orientation cannot be justified in any way, for it would be incapable of fitting in with or absorbing the necessary changes for the expansion of the rural sector on the contrary, it would contribute to confusing development efforts and to temporally deferring the reaching of the various objectives.

3.3.1 Objectives

The objectives of this option should in theory conform with the overall objectives of development on the national scale, which are established by the plan and are roughly presented as follows: (1)

- economic independence;
- improvement of the welfare of the people;
- a more equitable redistribution of income to satisfy basic needs.
- reconstruction of the foundations of the economy.

The sub-sectoral objectives, can be summarized as follows:

2.3.1.1 Dryland Agriculture and Irrigated Agriculture

Orientations for these two sub-sectors should permit the production of a maximum of 135,000 tons of cereal (all cereals) under present conditions in the year 2000, representing 43% of the cereal demand of which:

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(1) Based on the draft report by the Rural Development Planning Committee.

- 83 000 tons on irrigated rice fields as it is now being practiced and with double cropping 50-60% of the irrigated surface area;

- 52 000 on traditional land with all its components, viz. dieri farming in the River Valley, rainfed farming in the southeast and recessional plot farming in wadis.

This production would mobilize all the available labor force in the Senegal River Valley and in the dryland farming zones, which will be an estimated 712 718 workers in the year 2000.

3.3.1.2. Oasis Agriculture Sub-sector

In the area of oasis agriculture, the projection of present trend allows for very limited production growth, which would be due to the eventual entry of young palm trees into production. It has been estimated that this production level would be around:

22 000 tons of dates

30 000 to 50 000 tons of cereals

900 to 1000 tons of vegetables

200 tons of henna.

This production would not have any significant impact on employment in the oases; the number of workers totally or partially involved in the different oasis activities would be approximately the same as what it is now, even under the most optimistic projections.

3.3.1.3. The Livestock Sub-sector

The continuation of current trends in animal husbandry would result in production being determined chiefly by weather conditions.

In fact, under normal rainfall conditions, the size of the livestock herd and implicitly production and the added value of

the sub-sector, would be at practically the same level in 2000 as in 1980, or 2.39 million UBT's. Under the worst rainfall conditions, this number would tend to fall to 2.009 million UBT's in the year 2000, or a drop of 16% over 1980. Under the most favorable conditions, the same numbers would tend to grow, reaching a maximum of 2.86 million UBT's in the year 2000, which represents a growth of 65% over the base year and an annual growth of about 3.2%

3.3.1.4. The Artisanal Fisheries Sub-sector

Under the current projected conditions, the stagnation of inland fishing is inevitable with the construction of the Manantali dam (1) Around the year 2000, production should level off at 7,000 tons and employ 3 500 workers in all, which shows no progress whatsoever over the base year.

In artisanal marine fisheries, the projected orientations would allow a very modest growth in catches and the satisfaction of domestic needs; its influence on the balance of payments would remain minimal. Production levels would be around 30,000 tons in the year 2000, representing a total growth of 130% compared to 1980 production and a mean annual growth of about 6.5% In addition, this production would allow jobs to be doubled in this activity, which would grow from 2000 fishermen in 1980 to 4,000 fishermen in the year 2000.

3.3.2 Components of the Option

The components of this option are expressed by the principal orientations assigned to each sub-sector and are to be carried out by a series of projects, some of which deal with the institutional framework and with supporting measures (personnel training, research, extension, credit, etc.). These projects, such as they are presented in the sectoral commissions' reports, are presented by sub-sector of activity. In fact, in the present situation, it is at the different sub-sectoral levels that project ideas are drawn up. Once they are approved and financing has been acquired, these projects are undertaken and controlled by the same sub-sector. The sub-sectoral orientations and the projects assigned to them are presented in the following. Only those projects dealing with the institutional framework have been considered.

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(1) RAMS report on Inland Fisheries

33.2.2. The Livestock Sub-sector

3.3.2.1.1. The Orientations : Four Orientations have been defined:

(i) experimentation and then generalization of methods of improving grazing lands, which includes several sections.

(ii) Organization of a livestock support program which includes four sections, including training and supervision of livestock raisers, in situ.

(iii) project tests and programs centered upon stratification of herding.

(iv) genetic improvement of livestock by emphasizing zootechnology (Research at CNERV).

(v) promotion of poultry raising.

3.3.2.1.2. Projects

a) Project for supervision and training for herders in Gorgol which entails : supervision and training of the herders technical support for veterinary research and experimental fattening of livestock.

b) Improvement of pasturage and animal production, which stretches over 5 years and has the following objectives:

- Carto-pastoral study of the pastoral ecology of the selected zones.
- Introduction of rational livestock raising methods
- Definition and diffusion of extension themes to improve livestock yield .

This project is located in the Assaba region and could be expanded to include the Brakna and the Tagant.

c) Livestock breeding development project in south west Mauritania, which includes a supervision and training section, among others.

d) Project for the development of livestock raising in southeast Mauritania and which includes a supervision and training section.

e) Construction of the Animal Husbandry Department and a central garage.

f) Restoration of the buildings of 4 livestock inspection stations.

g) Reinforcement of logistical means - rolling stock and fuel (furnishing vehicles for 16 livestock sub-sectors and for the supplies division.)

h) Strengthening of the outreach ability of the Livestock Service

i) Technical support for the Livestock Department.

j) Supervision and training of the herders in southeastern Mauritania. This project is comprised of :

- community development: rational management of the grazing lands and herds.
- pastoral hydraulics
- sanitary activities in collaboration with the herders.

k) Experimental station in Hodh El Gharbi; this project focuses on the rational use of natural grazing lands. It includes many components, including technical and economic studies to define a management policy for extensive livestock raising, extension.

l) Updating the study for a feedlot in Kaedi.

m) Taking a census of the livestock population.

3.3.2.2. The Agricultural Sub-sector

3.3.2.2.1. Orientations : There are several such orientations which should lead to food self-sufficiency and which have been put together as follows:

(i) integrated development : This would entail taking into consideration the relationships among the different rural activities for better soil utilization.

(ii) water control : for better agricultural development which should lead to the defining of a water development policy:

in the river zone

in the agro-sylo-pastoral zone

in the oasis zone.

(iii) production support and encouragement

encourage and favor the producers' participation in agricultural development

guarantee sufficiently profitable agricultural prices

set up a farming credit system

supplying, storage and marketing of agricultural products.

(iv) Research and Training

research on millet, sorghum and cowpeas cultivation and on irrigation, crop protection and plant material improvement.

make proven research results available to farmers.

explaining techniques to the farmers.

3.3.2.2.2. The Projects

a) Mobile extension service teams:

This project will make it possible to reach rural people in agricultural zones by means of radio, visits, meetings and demonstrations.

b) Study on the development of farm industries: with the development of market garden production and commercial crop production, plans have been made to undertake a study on farm industries.

c) Reinforcement of the supervisory capacities of the rural agricultural offices.

d) Evaluation and organization of Agricultural production and marketing.

e) Reinforcement of the National Crop Production Service.

f) Reinforcement of the extension service.

g) Creation of a documentation and translation unit. The objective of this project is to collect, analyze, distribute and translate the documents concerning the agricultural sector.

h) Rural radio. This project is to be implemented with the collaboration radio Mauritania. Specifically it will study the information problem in the rural environment.

i) Assistance for blacksmiths: the aim of this project is to teach local artisans how to fabricate spare parts and tools for (animal draft) farming.

j) Village and community level integrated development project

3.3.2.3. Agricultural Engineering

3.3.2.3.1. Orientations

The objectives of agricultural engineering center around 3 points:

i) tapping surface water resources for the reinforcement and maintenance of the rural infrastructure;

ii) optimizing water use, increasing the possibilities of replenishing the alluvial water tables and introduction of irrigation from underground water using appropriate methods;

iii) supervising the rural communities and integrating them into development work on rural infrastructure.

3.3.2.3.2 Projects

a) Assistance project for the national promotion sites and creation of an agricultural engineering base in Aleg.

b) Equipping of a mobile unit for the maintenance and repair of rural public works equipment.

c) Reinforcement of the agricultural engineering garage.

d) Reinforcement of agricultural engineering technical personnel.

e) Project in Kiffa to create a team to build dams in Assaba, Guidimakha and Gorgol.

f) Project to build a shop for making gabions.

g) Creation of a rural engineering team in Aleg for the maintenance of dams connected with the development of collaide plots in wadis.

h) Creation of 10 experimental units for drip irrigation near 10 bore wells.

i) Creation of an agricultural mechanization unit to promote mechanization.

j) Creation of a surface hydrology section.

k) Various studies.

3.3.2.4. SONADER

3.3.2.4.1. Orientation:

This essentially involves implementing the program for irrigated agricultural development in the river region, which is designed within the framework of the Mauritanian government guidelines.

This program has 3 objectives, which are:

i) For the valley's rural population to gain access to irrigation techniques as quickly as possible.

ii) To satisfy the food demand of the country.

iii) To attain full employment among the entire rural population.

The implementation of this program requires the adoption of a legislative and regulatory framework for the lands which are to be improved, the establishment of incentive-producing agricultural prices and other supportive measures (farm roads, commercialization and storage of grain, training of peasants, crop diversification, etc.).

It is in that line of thought that SONADER recently established a policy for training, extension and community development on irrigated plots (1) , whose primary long-term objective is to introduce a structure of multi-purpose training capable of introducing the peasants to methods of irrigated farming and at the same time make them aware perspectives offered to them by the introduction of irrigated farming.

The strategies of this policy can be summarized as follows:

(1) Supervision of the small plots: Two types of operation have been proposed taking into consideration the rate at which improvement takes place and the quality of the supervision:

- Class extension work- with relatively low density, for the old irrigated fields,

- Assistance from mobile training and outreach teams, composed of very high-level technicians.

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(1) SONADER - DMVP - April, 1981.

Besides these 2 operations, the creation of an agricultural advisor's post has been proposed: the agricultural advisor's role in the first phase will be to supervise and coordinate the grass-roots trainers on the plots and finally to finish the work already started by the mobile training teams.

The content and conditions of training, supervision and community development should center around 4 main themes:

- planning of the objectives to be attained in the short term (seasonal strategy etc.);
- popularization themes;
- making the producers aware of problem in general;
- relations with the managing agency, SONADER;
- organization.

(ii) Supervision of the large fields. The overall approach to adopt in supervision and training will be taken from the same perspective as that recommended for the village plots: Classic grass-roots supervision complemented by the assistance of a high-level multi-disciplinary team. It also has several special features which relate to the special problems of certain plots.

The supervisory structures, for the small plots as well as the large plots, should evolve in the following manner: In the first phase, the basic personnel is to be reinforced, then, after a certain stage, it will be phased out until it is completely eliminated in order to make room for an agricultural managerial staff such as it is structured at present.

(iii) Complementary Training Programs: These programs cover:

- complementary training programs for the trainers (skill up-grading sessions) and establishing of ties with the Kaedi school;

- complementary training programs for the peasants: management training, cooperative training, and training for village pump attendants.

(iv) Integration of Training Institutions (mobile training team) into the SONADER structures at the central level and at the regional center level, and assessment of actions undertaken.

3.3.2.4.1. Projects

The main project with regard to the framework is the implementation of a policy for training, extension services and community development on the irrigated plots summarized above. Other projects involve putting up SONADER's buildings, such as the construction of its head office, the construction of regional sectors (Rosso-Gouraye) and the setting up of a computerized management system.

3.3.2.5. Environmental Protection

2.3.2.5.1. Orientations : These seek to create a stringent policy for grazing land management and rangeland organization which must complement measures aiming to cut down on the abusive use of shrub and forest vegetation.

They are based on the following actions:

(i) Rehabilitative and protective actions - dune stabilization and efforts to stop moving sand; protection of plants and wildlife.

(ii) Activities to control the deterioration of soils and biotopes;

(iii) Complementary actions, within the scope of integrated operations: intensive reforestation, fire control, etc.

(iv) Forest production actions: creation of village wood lots, planting of forest areas, reforestation.

(v) Institutional actions:

- Revival of the environmental Protection Department
- Creation of a coordinating structure in the fight against desertification; National and Regional Anti-Desertification Committees.
- Land tenure legislation(Forestry Code)

vi) Educational, Training, Consciousness-Raising and Research Actions.

3.3.2.5.2. Projects:

a) Physical and socio-economic studies

b) Assessment of the ligneous vegetation potentials.

c) Integrated Rural development around M'bout.

d) Support services for the farmers of Diowol.

e) Demonstrations of dune stabilization.

f) Intructional posters for anti-desertification measures.

g) Protection and improvement of the Tintane palm grove etc...

3.3.2.6. SONICOB : Societe Nationale pour la Commercialisation du Betail et de la viande

A decision recently made by the Council of Ministers expands its duties to supervising and training herders, and maintains its monopoly on livestock exporting.

2.3.2.7. La Societe Mouritano-lybienne d'agriculture et d'elevage

This company should strengthen the government's actions in favor of the rural sector by developing animal husbandry techniques (ranches, feed lots).

3.3.2.8. Agricultural Credit

This institution must be set up quickly. In theory, the government has already approved it. This is a matter of allowing the largest possible number of farmers to have access to farming credits so that they can cover their farm expenses and production costs, without their having to take out loans from merchants at exorbitant rates. The agricultural credit fund is attached to the National Development Fund (FND) and has been granted 400 million UM.

3.3.2.9. Fisheries

3.3.2.9.1. Orientations

The orientation for the fishing sector centers around the creation of the National Fisheries Office (ONP). In effect there are strong arguments for bringing the administration and management of fisheries under a single organization, the ONP. An enormous need exists to develop ties between the industrial sectors in order to establish communications among them, both for efficiency and the rapidity of decision-making.

(i) surveillance, resource information, license and participation in ventures

(ii) stocking of fish, quality control, marketing.

(iii) development of fisheries, jobs, training

(iv) port operations.

Some of the improvements should make it possible to have a better decision-making system and should aim at cutting down the restrictive functions called "control" and increasing functions leading to expansion. A National Fisheries Office would provide a single source of funds and a single financial controlling office, which would allow more efficient use of the funds.

This unified approach would above all focus on encouraging the necessary changes in industry, by eliminating restrictive legislation, imposing a guideline of minimum functions required in all areas of regulations, and striving to grant priority to some of the key

matters which have not yet been analyzed extensively enough or which demand more consideration. Some examples of the latter cover the fishing populations, marketing catches, supplies and the effective training of personnel.

Notwithstanding, no large agency can be set up within a short period of time, no matter how useful it may be. A stage-by-stage plan would have to be applied.

The long-term goal should be to create a single efficient, well-run agency covering all aspects of Mauritanian fishing. This agency should be an office in one of the ministries and should include separate units to manage assistance, information and control. In general, each of these new departments would function in the following areas:

- Port and maritime affairs
- Fisheries development
- Administration
- Commerce
- Personnel and finance.

3.3.2.9.1. Projects

a) Construction of a chain of cold storage warehouses and distribution stations in the main urban centers.

b) Setting up a means of surveillance

c) Research program.

d) Training.

These projects would also involve the other types of marine and semi-industrial fisheries.

Inland Fisheries

e) Development of inland fishing.

3.3.3 Evaluation of the Option

3.3.3.1. Analysis of the Human Resource Requirements

According to the Reports by the Planning Commission for Rural Development and Fishing, additional demands in human resources until 1990 would be as shown in Table 15 below.

Table 15: Human Resource Requirements in 1990 for Units of Rural Development and Fishery

Sector/Sub-sector	Level of Education	Senior Level	Middle Level	Operating Personnel
- Agriculture		79 (17)	290 (19)	1700 (87)
- Livestock, animal and health		- (8)	200 (31)	300 (85)
- Environmental protection		21 (7)	87 (3)	670 (54)
Rural engineering		n.d(3)	-	(4)
Statistics		-	- (11)	-
- Fisheries		29 (24)	24 (17)	66 (26)
Total		105 (54)	577 (71)	2710 (266)

( ) * Number of personnel currently employed (1980)

These personnel should be put in place progressively in 1980.

To determine the requirements in the year 2000, the hypothesis taken is 59% annual growth in staff starting in 1990 which accounts for the replacements on the one hand and the growth in real needs on the other hand. So, in the year 2000, the demand would prove to be as follows:

Table 16: Human Resource Requirements in 2000 for Option C

Sector/Sub-sector	Level of Education	Senior Level	Middle Level	Operating Personnel
Agriculture		115	420	2 470
Livestock and animal health		12	290	435
Environmental protection		31	126	972
Rural Engineering		5	-	6
Statistics		-	2	-
Fisheries		42	35	96
Total		205	838	3 978

Taking into account existing staff, between now and the year 2000, the following number of staff would have to be trained:

- 151 top-ranking personnel
- 627 middle-ranking personnel
- 3,712 supervisors and field personnel

3.3.2. Analysis of Financial Resource Requirements

3.3.1. The Costs of Training

They were estimated in the same way as for the other options and suppose:

- 3-years of training at ENFVA of Kaedi for moniteurs (B-level) and conducteurs (C-level) personnel,
- 2-5 years of training abroad (gratis) for top and middle-ranking personnel, respectively.

The costs are as indicated in Table No. 17.

Table 17: Training Costs for Option C
(millions of UM in 1980 prices)

Training Level	Number to be Trained	Primary and Secondary	ENFVA Training	Graduate Training Abroad	Total
Top Level	151	85	-	90	175
Middle Level	767	434	-	188	622
Supervisors and field personnel	3712	761	4360	-	5121
Totals	x	1280	4360	278	5918

These costs are broken down as follows between rural development and fisheries.

- Rural Development 5,853 m UM
- Fisheries 65 m UM

3.3.3.2.2. Costs of New Units - Investment Budget

The costs of the new budgets are, in principal represented by the MDR investment budgets section and fishery in the state's equipment budget.

In the present situation, the Equipment Budget of the MDR represents an average 11% of the state equipment budget, and that of fishing represents 40%. Hence, taking the forecast for the state's equipment budget (1) between 1981 and the year 2000, and granting that these ratios would be practically the same during this same period, the equipment budgets could be assessed as follows:

(Table 18).

Table 18 : Costs of New Units for Option C

	Elementary and Secondary Education	ENFVA Education	Executive Training Abroad	Total
	1985	1990	1995	2000
Ministry of Rural Development	116	330	528	803
Fisheries	-	-	-	-

3.3.3.2.3. Operating Budget

For the Operating Budget, the figures, just as for the Equipment Budget are based on the current ratios, which are approximately 1.8% for the MDR (average from 1979/80/81) and 0,062% for fisheries (2) (5 years average: 1975-79)

(1) See report in the RAMS Development Strategy and Macro-Projection Report, April, 1981.

(2) Only the Fisheries Division has been taken into consideration.

Table 19: Summary f Financial Resources* Required by Option C

	1980	1985	1990	1995	2000
Ministry of Rural Development					
- Training	-	508	508	13	13
- Equipment	66	110	330	528	803
- Operating Costs	164	232	374	603	970
Fisheries					
- Training	-	5.6	5.6	1.5	1.5
- Equipment	-	-	-	-	-
- Operating Costs	5	8	13	21	33
Credit					
- Development		400	400	400	400
- Fisheries	7	70	70	70	70
Totals	235	1334	1701	1637	2291

* in million of UM.

Tables 20 : Financial Resources* Required for the Various Options

	1985	1990	1995	2000
Option A_1	1063	1860	3408	5116
A_2	1060	1856	3450	5129
B	1037	1255	1595	1796
C	1334	1701	1637	2291

* in millions of UM, 1980 prices

Chapter Four: Comparative Analysis of the Different Options in Terms of Their Potentials and Limitations

A comparison of the different options in terms of the resources required to implement them shows that:

4.1 From the point of view of financial resource requirements

(Table 21), Option A and its two variations, is the most promising; next comes Option C and finally Option B, which requires a much more modest amount of resources. Nevertheless, it must be remarked that the estimation of these resources has included virtually the entire cost of the operations without taking into consideration the source of financing; in other words, nothing has been specified regarding either government or local community contributions. In this area, it is evident that the competent authorities must study and establish the means for coordinating the various sources of financial contributions to be involved.

Table 21 : Financial Resources Required for Different Options

(millions of UM in 1980 prices)

	1985	1990	1995	2000
Option A_1	1 063	1 860	3 408	5 116
A_2	1 060	1 856	3 460	5 179
B	1 037	1 255	1 595	1 795
C	1 334	1 701	1 637	2 291

From an objective point of view, it will be necessary to study the possibility of giving total or partial responsibility to the producers for paying operating and capital costs on the CER level (Option A) or on the development site level (Option B). These possibilities should be studied in terms of the physical and human environment of

the CER's or sites being considered ; they should be examined as realistically as possible. This presupposes the prior existence of producers' organizations, a certain management capacity among these organizations and most of all, an understanding of basic organizational principles which should be clearly understood by all memebers. In any event, organized consciousness raising campaigns through speeches, visits, seminars and all other possible means must be carried out in rural areas no matter which option is to be implemented. Because it is a question of creating new forms of organizing production, these forms must have links with tradition and must be linked to a will to overcome the problems of udnerdevelopment; a dynamic spirit and an ability to take positive action are essential qualities in this process. The cooperative experiment of the 1960's should be able to provide certain basic elements needed in reconstructing new methods in improving the situation through existing cooperative structures.

Once such a foundation were established, people in rural areas would be able to finance their own development, if only in part. It is a question of self-supporting development aided directly by the government through other institutions (credit, affiliated organizations, research, training, etc.).

4.2 From the point of view of costs and advantages of the different options (Table 22) by matching the advantages of the different options with the rise in the value of production provided by each option while at the same time studying the actual costs of each one as represented by:

- training costs
- equipment costs
- operating costs
- credit costs (assumed to equal 10% of refundable needs), it can be concluded that:

Under Option A, production should rise at the rate of 4.3% a year between 1980 and the year 2000 whereas support costs will come to 2.1% of the value of production in 1980 and 8% in the year 2000.

Table 22: Progression of Production Value and Costs of Supportive Measures (1980 - 2000)

Options	Year	1980	1985	1990	1995	2000
Option A						
(1)	Value of production	10 825	13 000	16 700	18 500	21 300
(2)	Supportive measures	235	706	891	1 276	724
(3)	$\frac{(2)}{(1)}$ %	(2.1)*	(5.4)	(5.3)	(6.8)	(8.0)
Option B						
(1)	Value of production	10 825	11 600	14 100	15 400	16 400
(2)	Supportive measures	235	373	483	618	704
(3)	$\frac{(2)}{(1)}$ %	(2.1)	(3.2)	(3.4)	(4.0)	(4.2)
Option C						
(1)	Value of production	10 825	11 500	13 300	13 800	13 800
(2)	Supportive measures	235	911	1 278	1 217	1 868
(3)	$\frac{(2)}{(1)}$ %	(2.1)	(7.9)	(9.6)	(8.8)	(13.5)

* The figures in parentheses are percentages.

Under Option B, production should rise by 2.5% a year while support costs will go from 2.1% of the value of production in 1980 to 4.2% in the year 2000.

Under Option C, production will increase at the rate of 1.3% a year during this period whereas support costs will rise from 2.1% of the value of production to 13.5%

This figures shows that:

Option C cannot be economically justified in terms of its advantages, which essentially amount to the rise in value of production but are still much lower than the overall costs of the supportive measures. It is to be noted that although most training costs have been built into the first decade of the 1980-2000 period (Cf. Option C ch. 2.3.3.1), the total costs of the Option are still relatively high. Furthermore, the calculation of operating budgets included no line items for salaries. Whatever the estimates made in evaluating this option, the costs will not be very different from calculated values.

Option A is less costly than Option C in so far as the gaps between additional production and costs are less extreme although still significant. These gaps could be reduced in various ways such as:

- higher productivity, particularly in irrigated agriculture;
- reduced training costs via radical measures in training systems (Cf. ch. 3.3);
- reduced supervision in the field once a certain level of development has been reached or once an improved road network reduces the costs of supervision. The trainers, who are mainly extension agents, could, given certain incentives, become model producers.

Option B is by far the least expensive, although there are still gaps between the costs and the advantages. It is true that in the year 2000, when this gap is the widest, it still amounts to only 1.7% of the value of production. This problem could be overcome by combining a certain number of assumptions concerning

the productivity of irrigated agriculture and training costs. In effect, in the assumptions made when the costs of the different options and supportive measures were calculated, no provisions were made for changes in productivity or an improvement in development-oriented training programs; in other words, current trends were projected and their pessimistic conclusions do not necessarily hold, particularly in the cases of Options A and B.

Furthermore, it would seem quite feasible, as in the case of Option A_2 that there could be a reduction in the intensity of supervision at the sites once a certain stage of viable systems of production or of road development had been reached. Thus, trainers could be moved from one site or region to neighboring or similar sites or they could become producers themselves.

4.3 From the point of view of human resources

Table 23 (below) shows what human resource needs will be for each option by the year 2000.

Table 23: Human Resource Requirements for the Different Options

	Top level personnel	Mid-level personnel	Field-level personnel
Option A_1	268	599	2 812
A_2	273	622	2 935
Option B	225	343	675
Option C	151	767	3 712

The personnel shown in this table are the persons to be trained between 1980 and the year 2000. Mid and top-level personnel will have to be trained abroad. Lower and field-level personnel (B and C-level extension agents, mechanics, blacksmiths, etc.) would be trained locally in Mauritania.

In terms of the personnel needs for the 1980-2000 period, the following will have to be trained annually:

- 14 top-level persons, 30 mid-level and 140 lower and field-level persons for Option A.
- 11 top-level persons, 17 mid-level and 34 lower and field-level persons for Option B.
- 8 top-level, 38 mid-level and 180 lower and field-level persons for Option C.

Considering the numbers of mid-and top-level persons to be trained abroad in relation to the number of students now studying in other countries (874) (1), it would seem, a priori, that there would be no problem in meeting these needs. However, in view of the problems in orienting students in different disciplines, in re-integrating graduates and in choosing appropriate institutions for training rural development personnel (2), it will be difficult to meet the personnel needs of the options under consideration, both in terms of quantity and of quality. Nevertheless, these problems should be solved under Options A and B by means of the institutions that would be created to carry out research, extension work and training; this is not the case, however, under Option C.

As for the training of mid-and field-level personnel, who are mainly B and C-level extension agents, it will be impossible to meet the personnel needs of Options A and C given the low output of the ENFVA (40 graduates a year). The school's training capacity would have to be considerably increased and this appears, at first sight, to be a gigantic undertaking.

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(1) Formal Education.

(2) Ibid.

Objectively speaking, this problem can only be solved through a radical change in the system of formal training for rural development work through emphasizing informal training. Education in this field could benefit from experience in view of the costs inherent in formal training in Mauritania, which are very high if not exorbitant. In fact, under present conditions, the training of a single field level agent in Mauritania costs more than the training of a highly trained top-level manager in other countries.(1)

(1) Formal Education.