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Seed Multiplication in Niger

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Context

Following the drought of 1973 in the Sahel, USAID invested in a series of projects across the zone to alleviate the shortage of seed for the major food crops grown in the region: millet; sorghum; cowpeas; and peanuts. In Niger, this investment took the form of the National Cereals Project (NCP) which contained elements needed to create a seed multiplication system in addition to an existing program within the french-based agricultural research system. The effort to install the needed infrastructure covered most of the crop production zone in Niger. At that time there was only one improved variety of millet available to the public, P 3 Kolo, a selection from the combination four local land races, released by IRAT in 1962 and re-released by INRAN in 1977. There were no other improved varieties available for multiplication at the time of project start-up in 1975.

Infrastructure

Under NCP, six seed farms were built (1975-1977) as shown in Figure 1. A foundation seed farm was created at the INRAN supported sub-station at Lossa with an irrigation capacity covering 48 ha. The other five farms covered 60 ha. each and were not irrigated. Each farm was fenced in, had a 1000 ton capacity warehouse, a seed cleaning and treatment chain, mechanized agricultural equipment, a large threshing and drying area, offices with a seed testing laboratory and housing for several staff including the farm manager and his assistant. The value in 1989 of the investment in these farms was about 2 million dollars.

Production during the period 1975-1980 was minimal as the farms were underr construction. The second phase of NCP was funded by USAID's Agricultural Support Program, (APS) 1982-1989, which followed a policy of maximizing seed production was followed. For the rest of this discussion, NCP/APS refers to both phases of the project.

Multiplication System

The multiplication system in Niger consists of a four year cycle. Breeder seed (M0) is grown by INRAN in year I and given to the foundation seed (M1) farm where M0 seed is grown out in year II to produce M1 seed. This seed is given to the five seed farms for production of "registered" seed (M2) in year III. The "registered" seed is given to farmers under contract who live around the seed farm to produce M3 certified seed in year IV. The M3 certified seed is then recovered by the seed farms and distributed to the public through government networks in year V. The administrative relationships between the various elements is presented in Figure 2.

Seed Production Planning and Price Determination

Production targets were set each year in the first quarter of the year by the National Seed Committee, an interministerial body charged with providing guidance to the national seed program. Prices were fixed by this committee each year and were applicable for the entire year. The buying price to seed producers and the selling price to certified seed consumers was applied throughout the county without regional differences. The buying price was theoretically set at a level 25% above grain market prices at a given date during the harvest in October to insure that M3 seed producers sold their product to the seed multiplication project and not on the open market. The sales price to consumers was also theoretically set at a level just above the grain market price in May and June prior to

planting. However this policy created a situation in which M3 seed was most often sold for less than it cost except in the case of cowpeas. For example, the Maradi regional agricultural officer who oversaw seed multiplication activities gave the following figures for the purchase and sales for M3 millet and cowpea seed grown by contract farmers and then sold to the public.

This policy also required the infusion of funds to cover these losses at the M3 production level each year during the marketing campaign by the state. From 1985-1989 the USAID funded Agricultural Sector Development Grant(ASDG) provided the NCP/APS seed multiplication program over $10 million to buy and sell seed. The decapitalization of these revolving funds eliminated any hope of recovering recurrent costs for the post-NCP/APS period.

The seed multiplication coordinator of NCP provided the secretariat for the National Seed Committee. This committee met once or twice a year. In 1989 price fixing by the National Seed Committee was abandoned in favor of permitting each region to set its own prices. With the end of the APS project in 1989, the committee ceased to function; its major activity was transfered to the newly created regional seed committees which currently determine pricing policy. This decentralization of decision making is one of the policy reforms that became operational in the post-NCP/APS period.

Seed Farm Activities

Once production targets were set, they were transmitted to each of the regional farms. Seed farm managers then prepared their production schedules. For M2 farm managers this entailed planning for the 60 ha. of M2 seed on farm and contracting for M3 seed production among farmers living around the farm. Contracts were signed for M3 production with private producers who could group themselves into blocks to facilitate quality control inspections. M3 growers would receive seed and fertilizer from the farm manger on credit, payable at the end of the growing season once the farm manager recovered his contracted production. Interest was charged and was usually 50%, ie, a farmer received 20 kg improved seed at the beginning of the season, and had to repay 30 kg of seed at the end of the season. The farm manager maintained contact with these contractors through the use of 10 extension agents assigned to each farm manager. The NCP paid the salaries of these extension agents.

These extension agents were responsible for managing the contacts with M3 producers. These agents provided training to M3 farmers on the special requirements needed for seed production such as isolation and the removal of off-type plants. Adherence to the norms set by the seed farm manager was monitored by the extension agents to insure a measure of quality control. At harvest these agents coordinated the pick-up and delivery of uncleaned seed to the seed farm where it was cleaned, bagged, tagged and stored. Payment for seed produced by these M3 private contract farmers was also handled through the extension agents and the farm manager once they received funds from NCP in Niamey.

Distribution of M3 improved seed

Farm managers in concert with the government agricultural staff then arranged for distribution of M3 seed through the intermediary of the rural cooperative movement. Seed from the farm was shipped to various agricultural extension agents for distribution to

regional cooperative representatives or to individuals that came to the regional agricultural office. (There are from 4 to 8 agricultural extension offices per *arrondissement*). Distribution of seed occurred in April, May and June and was almost always based on a credit transaction, rarely a cash transaction. Recuperation of credit occured at post-harvest time.

Receipts were deposited in the regional cooperative accounts which in turn transmitted these funds to the national credit agency (CNCA). Once in the CNCA, funds were rolled over to finance future seed buying and selling campaigns. Figure 3 presents the evolution of funds deposited into the CNCA as a result of improved seed sales through the APS project. Unfortunately, the CNCA went bankrupt in 1989 and the seed program lost all of its assets deposited there. This event was provoked by poor credit management by the bank's administration. The loss of these funds combined with the high decapitalization rate of the entire credit scheme was in some ways more disasterous for the seed program than the closure of NCP/APS.

Post-NCP/APS Period and Policy Reform Implementation

The NCP/APS project ended in June 1989. Two years earlier, a group of concerned USAID and government officials began to examine the fundamental policy underlying maximum seed production in light of very high subsidies required by the seed program. They recommended that the program should focus on the reorientation of seed policy into four broad subject areas: decentralization of decision making, reduction of production costs through privatization and diversification, improvements in quality control and the establishment of a national seed security stock. USAID, through its ASDG project and CRED contract, provided technical assistance and local currency funding to implement these reforms in the post-NCP/APS period. However, in the absence of the NCP/APS project, seed production output in all generations fell dramatically in 1989, 1990 and 1991 due to low effective demand and the low levels of cash sales to replenish marketing funds. Levels of production under the regional seed committees' control are currently a function of the magnitude of the revolving funds controlled by the committee determined by sales revenue generated each year.

In 1990, USAID and the government of Niger agreed to fund a three year project from the ASDG counter-part local currency account. The objectives of the project are found in the flow diagram in Figure 4. It shifted the emphasis away from maximizing multiplication for multiplication's sake to a program that is more demand-driven, without the need for large credit and extension actions. It provided for an expanded effort with respect to quality control in the laboratory and in the field. This took the form of training for seed quality inspectors and the installation of a central seed testing laboratory in Niamey to permit surveillance of regional seed labs located in each department. It encouraged diversification into fruit tree multiplication and training for village level fruit tree nursery operators. Physical rehabilitation of the fruit tree germplasm parks was included. Special emphasis was put on the quality of operations at the foundation seed farm at Lossa. Finally the project put in place the means to promote the use of improved seed through demonstrations, field days, radio publicity and sales publicity. Underlying the project activities was a study to examine the structure and performance of the market for improved seed by implementing annual seed consumption surveys.

This project ended on March 31, 1992 after failing to achieve its objectives. The failure was due to the lack of access to the funds that USAID deposited with the government for execution of the program. These funds were instead used by the government in early 1990 to meet its operational bills; particularly government salaries. As a result, the project never really started and was unable to carry out 80% of the planned activities.

Implementation Difficulties

During the last sixteen years, the seed program in Niger has encounter numerous problems with the execution of seed mulitiplication and distribution actiivites, most of which are common to programs in the Sahel region. Problem areas include planning and programming, costs of production, quality control, use of trained personnel, and marketing.

Planning and Programming

The determination of how much seed to produce each season was a simple mathematical execise as shown in Figure 5. Each year a constant multiplier was used to obtain production goals based on previous years' goals No consideration was given to how much seed could actually be sold, instead targets were based on arbitrary five year plans. This was due to the lack of information on the level of effective demand and the level of expected sales in any given year. Obtaining such information was not a priority. In 1986, Dr. W. Couvillon of Mississippi State University noted the total inability to track M3 seed sale transactions around the seed multiplication farms. The seed multiplication project had ten seed extension agents per center to monitor such activity, but, they were unable to keep satisfactory records of actual seed sales which could be correlated to revenues deposited in the CNCA bank.

Programming the diverse activities with the plethora of players in a seed program of this size was never easy and was usually approached by following the plan of work established by the project and its planners. The weakness of the programming effort could be seen by the inability to get a quality product to the marketplace in time to be bought for planting. It must be noted that improvements in programming come from trial and error over time. The seed industry in many developed countries took decades of effort before reaching commercial viability. With time the problems in the area of planning and programming should be possible to overcome.

Costs of Production

Put very simply, the cost of seed multiplication in Niger was far greater than the value of sales . This was due to the presence of the NCP/APS program which was interested in maximizing production despite the cost. It must be noted that economies of scale are very important when considering the reason why such high costs exist at all levels of multiplication. For example, the production of foundation seed is subsidized in almost every country in the world due to high fixed costs and low output due to quality controls. In Niger, M1 seed was never sold and was given free to M2 seed farms, this is illustrated in Figure 6 in which the very high costs of M1 seed are not passed on to the next generation of seed producers. An analysis of operating costs on the M2 seed multiplication farms indicated that the highest cost element was vehicle maintenance followed by personnel as shown in Figure7. In 1984 a study was done by the NCP/APS project to determine ways to reduce costs on the farms. It is ironic that one of the major

recommendations was to remove mechanization from the farm. This recommendationwas rejected.

Any anaylsis of costs must reconcile the fact that the seed program was concentrating on the multiplication and distribution of improved seed for low value food crops (millet, sorghum and cowpeas). Sales prices are directly linked to grain prices. In Niger, the government traditionally set grain prices (discontinued in 1989) while the National Seed Committee set seed sales prices. In a bad production year, grain prices may rise quickly at the end to the season and actually surpass previously set seed prices, thus providing an impetus for M3 seed producers to sell seed as grain! In the past two years, seed prices paid to M3 producers have been flexible with a premium being paid for seed lots that surpass quality standards.

However, seed does cost much more to produce and process for sale than does grain production. Making a profit on the sale of M3 improved millet seed is difficult in the best of times. Ultimately, the engine driving down production costs can only be the presence of strong effective demand for seed of improved varieties. The lack of expressed demand will continue to plague the seed program until truly superior varieties are developed by the agricultural research program. In 1990, INRAN released breeder seed for three new sorghum lines developed over the past 10 years. Field demonstrations and farmer feed-back have been positive and there is some hope that the production of improved seed could be profitable at the M2 or M3 level. One of the cultivars is an F1 hybrid which only takes one generation in which to produce certified F1 seed, provided parental lines are maintained simoultaneously. If successful, this hybrid could be used on various irrigated perimeters. The advantage that hybrid seed producers would enjoy would be that users must return each year to purchase new F1 seed. This type of constant demand implies a certain level of profitability, albeit small due to the low volumes required to seed potential irrigated land with sorghum.

The post NCP/APS seed project sought ways to take the government out of M2 and M3 seed multiplication, as the government treasury could not afford the production subsidies. Privatization of M2 seed multiplication was envisaged by the transfer of farm land and resources to former M2 seed farm workers and former M3 contract seed farmers around the seed farms. Without the elements of credit, extension and above all a guaranteed market for seed once it is produced, such a privatization plan is being only slowly implemented. In 1991, among the five administrative departments with former NCP/APS seed multiplication farms, only one contracted out M2 production to private growers. Two of the farms were totally abandoned by the government and one continued to produce seed with dwindling state funding. Only in one department is there a real effort to shift production totally to the private sector without a government contract. In the Tahoua department efforts are under way to lease out the use of seed cleaning equipment to private growers who need to process their seed lots but do not have the equipment necessary. In addition, several cooperatives in the southern part of Tahoua are strong enough financially and administratively to manage a nacent onion seed production program. This is very promising as onion seed has high value and the current demand extends beyond Niger's borders. Combined with the fact that onion seed is relatively short-lived (12-18 months), consumers will have to return for fresh lots at least every two years.

Trained personnel

Training at all levels was rather extensive over the past 15 years. At the upper level, nine cadre were educated at Mississippi State University at the BS level (one at the MS level) in Seed Technology. The coordinator of the NCP had a seed technology degree as did three members of INRAN. In 1992, only one of the nine is directly involved in seed production and he is at INRAN. All the eight others are in administrative positions varying from *chef d'arrondissement* to consultant to the Canadian AID program (ACDI). This non-use of university trained seed technologists does not bode well for the future of the seed program in Niger.

On the other hand, the NCP/APS project has trained a significant number of technicians in all aspects of seed production, quality control and marketing. Short term in-country sessions in collaboration with INRAN were held annually in multi-locations for people involved in farm management, supervision of contract seed multipliers, quality control in the lab and inspections in the field, marketing techniques, cleaning and storage, etc. The most recent formal training, in which 13 agents participated, was held in September 1990 in Niamey for seed quality control inspectors.

Thousands of hours of training have been furnished. However, few trained personnel are still in the business of producing seed as subsidies normally attached to seed multiplication have been eliminated. Until solutions are found to compensate for the loss of these subsidies, the value of training of these individuals will continue to fall.

The Nature of Demand for Improved Seed

To have a positive impact on agricultural productivity, good seed of superior varieties must be obtained and used by many thousands of farmers. A logical question to be asked is to what degree good seed of superior varieties are being used by Nigerien farmers. Indeed, one of the current areas of policy dialogue concerns the role of the government in projecting seed needs and estimating effective demand.

Actual demand is not the same as perceived demand for seed. Agricultural decision makers in Niger often perceive a demand for seed without sufficient information. In the absence of reasonable estimates of demand, far too much seed was usually produced. It is not easy to assess market demand for seed of non-hybrid low-value food crops Market research is needed to gather information on actual farmer needs and desires, buying habits, buying power, estimates of potential consumers and alternatives available to potential clients. Market demand for seed can be expressed in practical terms : people will only buy a variety of seed when they know the variety exists, when seed is available, when they have the resources to pay for the seed, and when they believe use of the variety will benefit their farm activity.

What people say and do can be used by seed producers to forecast the market demand. One method to predict demand is simply to ask the seed buyer/consumer. For local seed producers, talking to neighbors may be all that is needed. Another method is to ask retailers, cooperatives or merchants in the case of Niger, since they know more about local market conditions than anyone else. Other methodologies exist such as using linear regression on time series data to predict the probability of a given level of demand, but these require more accurate statistics than are currently available.

In the open market place, a gross overestimate of actual demand may cause a private producer to go out of business. However, in the public sector, over-estimates resulting in over-production simply decrease operational efficiency, which translates into higher rates of subsidy. It is one of the objectives of the National Seed Utilization Survey to provide macro level seed use data for use by the government at the central level as a programming tool. From this baseline, the government can intelligently encourage commercial cooperation at the regional and local level. Given the regional variation, it should be the responsibility of regional officials to accurately estimate demand particularly in light of the current efforts to reduce costs of seed production and marketing.

Methodology

A questionnaire was prepared by the Seed Service, Ministry of Agriculture and Livestock (MAG/EL) in May 1988, with assistance from CRED, covering four crops: millet, sorghum, cowpea, and peanut. The Statistical Directorate (DSAE) within the MAG/EL was funded to execute the survey. In 1988, the NCP/APS project funded the survey, while in 1989 the ASDG project funded the survey under the University of Michigan technical assistance contract.

A stratified list of all villages in Niger was obtained using three population sizes (0-500, 500-1000, over 1000) as determined in the 1977 census. The number of villages chosen was based on an arbitrary factor equal to 12 times the number of *arrondissements* in each region. Once a village was chosen, five farmers within that village were randomly selected to be interviewed. The stratified random sample procedure permitted the arbitrary determination of sample size based upon limited survey resources without sacrificing precision. This is particularly important in Niger where logistical costs are high. In 1988, 400 villages within 31 *arrondissements* within 6 regions were sampled (Diffa, Dosso, Maradi, Tahoua, Tillabery and Zinder). In 1989, the number of villages increased slightly due to the addition of the two other regions that are only marginally touched by improved seed use (Agadez and Commune of Niamey).

Farmer Knowledge and Utilization of Improved Seed

In 1988, approximately one-half of all farmers said they knew about improved seed. However, in Maradi, 2/3 of the farmers knew about improved seed. This knowledge was gained primarily through contacts with cooperatives and secondarily from neighbors. A very few indicated receiving information through the media. In 1989 the identical results were obtained. In analyzing the market for improved seed, this information clarifies part of the problem: people only buy a variety of seed when they know the variety exists. It also portrays a situation in which consumers obtain market information from distributors. Of the farmers in 1989 who indicated a knowledge of improved seed, only a third actually used seed of improved varieties. This implies that even though a farmer knows about improved seed, it does not guarantee he will be using such seed. Therefore either seed is not available when they have resources to obtain them or they believe that the use of improved seed does not provide sufficient benefits to their farm operations.

The frequency tables generated on specific variety use by site verify that one in five farmers in Niger are actually using seed of one or more improved varieties. The actual results are presented in Tables 1 and 2.

The three principal reasons given for trying improved seed for the first time were: expectation of high yields; early maturity or just to test it out. Among users of improved seed Maradi led all other regions with an average of 4.2 years of improved seed use in 1988 and 4.9 years in 1989. The users in other regions averaged between 2 and 3 years.

For many the drought in 1984 and the extensive emergency campaigns starting in 1985 were the impetus to use improved seed for the first time. In the other regions, various *arrondissements* have improved seed use dating to 1984 or 1985 such as Birni N'Konni, Madaoua, Kollo, Tillabery, Matameye and Magaria. This question brings up a fundamental issue of why farmers adopt improved seeds in Niger. It suggests the important impact that a disastrous cropping season can have on varietal change.

Perceptions of Improved Seed Prices

In both 1988 and 1989 the farmer was asked to give his overall judgment on official improved seed prices that were set by the National Seed Committee each year. In both years only half the sample answered the question. In 1988, 24% said that seed purchase prices were satisfactory, and 15% said the price was high. In 1989 the responses were limited to a choice among, very expensive, expensive or not expensive. On the average one in six farmers said that seed was not expensive, one in six said it was expensive and one in twelve said it was too expensive; the remaining gave no response However, in Dosso and Zinder there were more farmers who thought seed was expensive than those who thought seed was not expensive. This suggests that price perception is not uniform through out Niger and that prices should vary by region.

Once the overall impression was given, the farmer was asked to give specific recommendations for sales prices of improved seed. In 1988 the question was poorly designed (if-then type of question) and generally misunderstood by the farmer. The farmer was asked to give his price with respect to the market price of local seed which was given hypothetically. Since seed prices are set officially, most farmers did not know what to make of the question. A majority simply did not answer the question. In 1989 the question was revised. The objective here was to obtain an estimate of the value added to improved seed over local seed that a farmer might be willing to pay for; i.e., is their sufficient value attached to improved seed to permit a profit to be made on its production and marketing. In 1989 the average suggested sales prices per kilogram of improved seed given by farmers were:

Millet		58 cfa
Sorghum	47	
Cowpea		97
Peanut		89

Those farmers who indicated that seed prices were not expensive gave suggested sales prices only slightly about the average just cited:

Millet		60 cfa
Sorghum	49	
Cowpea		100
Peanut		96

If you compare these figures with official prices set by the National Seed Committee, the above figures are all lower than official seed prices. In 1989 official prices were 95 cfa for millet and sorghum, 195 cfa for cowpeas and 125 cfa for peanuts. The situation is clear with respect to what farmers think of official prices. Even though many farmers say official prices are all right, they really feel they are too expensive. The problem then becomes the ability of a producer to supply quality seed for as much as the consumer is willing to pay, thus insuring some measure of profitability for the producer.

Limitations of the survey

There are many imperfections that limit the usefulness of this survey effort. Even though seed samples were obtained for each variety sited, they were never analyzed (due to a lack of resources) for quality or grown out to verify genetic characteristics (to eliminate confusion due to overlapping variety names). Another fundamental problem was the inability to link the data from the seed survey with the data from the wider CILSS agricutural production survey to which the seed questionnaire was attached. Land area measurements taken by the CILSS could be applied to the fields to which seed use responses were given, thereby permiting a more precise estimate of seed consumption.

Lessons learned

Subsidized seed multiplication is required to produce seed of low value food crops due to the high cost of producing seed in comparison with its value in the market place. In order for the seed industry to enter into the next phase of development, ie a move away from subsidies towards a more active role for the private sector, a minimum level of cereal seed sales equal to 2000 tons is needed to break even at the current cereal seed sales price. Figure 8 presents an estimate of cost per kilogram of seed produced as a function of level of production. This graphic uses the overall NCP/APS level of operation as a base from which to calculate the cost per kilogram produced.

Implementation of seed policy reforms concerning decentralization of decision making, diversification of production types, privatization to reduce costs of production and the improvement in quality are the means by which the seed program in Niger can evolve into the next phase of development for the seed program. Continued reliance on subsidized programs will continue to generate dependence on donors to provide the subsidies. In 1992, the absence of subsidies has virtually halted most activities in the program.

The long-term success of the seed program in Niger is fundamentally dependent upon the success agricultural researchers to find and develop new and superior varieties. One critical assumption underlying development of a seed program is that the program exists to replace local traditional cultivars with modern improved ones. It should not be used simply to multiply seed, particularly local varieties since farmers are more than able to do it themselves. In 1992, the new releases of sorghum from INRAN offer a measure of hope that the research efforts in varietal improvement at INRAN are bearing fruit.

References

Couvillion, W. 1985. Etude économique du Programme de multiplication des semences du Niger #1. Consultant Report. 80 pp.

Couvillion, W. 1986. Etude économique du Programme de multiplication des semences du Niger, #2. Consultant Report. 80 pp.

Ministère de l'Agriculture. 1987. Plan semencier national, document d'identification. Ministère de l'Agriculture. 39 pp. plus annexes

OPVN, 1987. La problématique de la commercialisation des céréals de base au Niger. OPVN. 6 pp.

Programme Céréalier National, 1987. Evaluation Interimaire du Volet Multiplication de Semences. Ministère de l'Agriculture. 83 pp. + annexes.

Projet de Dévelopemen des Activities Semencières au Niger, 1991. Rapport annuel d'Activités, période du 1er mars 1990 au 30 avril 1991. Direction de l'Agriculture, MAG/EL. 36 pp.

Rachmeler, D. 1991. Seeds in Niger: a New Policy Orientation. Unpublished report. 16 pp

Resser, R. 1980. Economics of Seed Multiplication Program. Consortium for International Development. Niger Cereals Project. 121 pp.

Reusche, G. 1984. Rapport de Mission. Unpublished report. 22 pp.

Service Semencier National, 1989. Etude de faillibilité de l'exploitation des centres semenciers par le privé après le programme céréalier national. Direction de la Vulgarisation et de la Promotion Coopérative. 16 pp. + annexes.

_____, 1989. Projet de Dévelopemen des Activities Semencières au Niger. Direction de la Vulgarisation et de la Promotion Coopérative. 47 pp. + annexes.

USAID Niger, 1989. Leçons retenues du programme céréalier national (provisoire). Programme céréalier national, Ministère de l'Agriculture et de l'Environnement. 61 pp.

Figure 1:

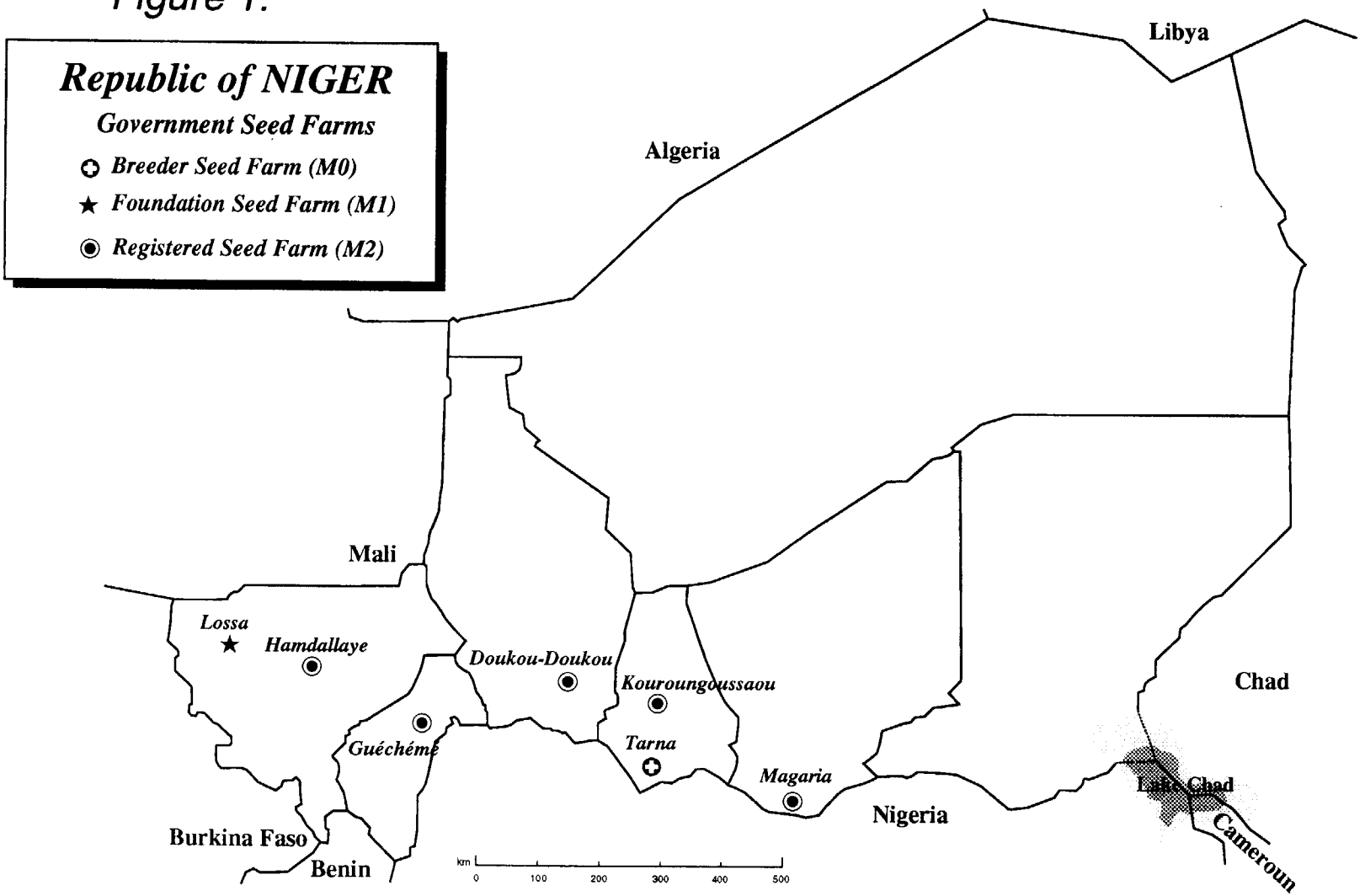

Republic of NIGER
Government Seed Farms
Breeder Seed Farm (M0)
Foundation Seed Farm (M1)
Registered Seed Farm (M2)
Libya
Algeria
Mali
Lossa
Hamdallaye
Doukou-Doukou
Kouroungoussaou
Guéchémé
Tarna
Magaria
Chad
Lake Chad
Nigeria
Cameroun
Burkina Faso
Benin
km
0
100
200
300
400
500
Prepared by: CRED-UNIVERSITY OF MICHIGAN/DEP/MAG/EL, March 1992

Figure 2: Niger Seed Multiplication Organization, 1978-1991

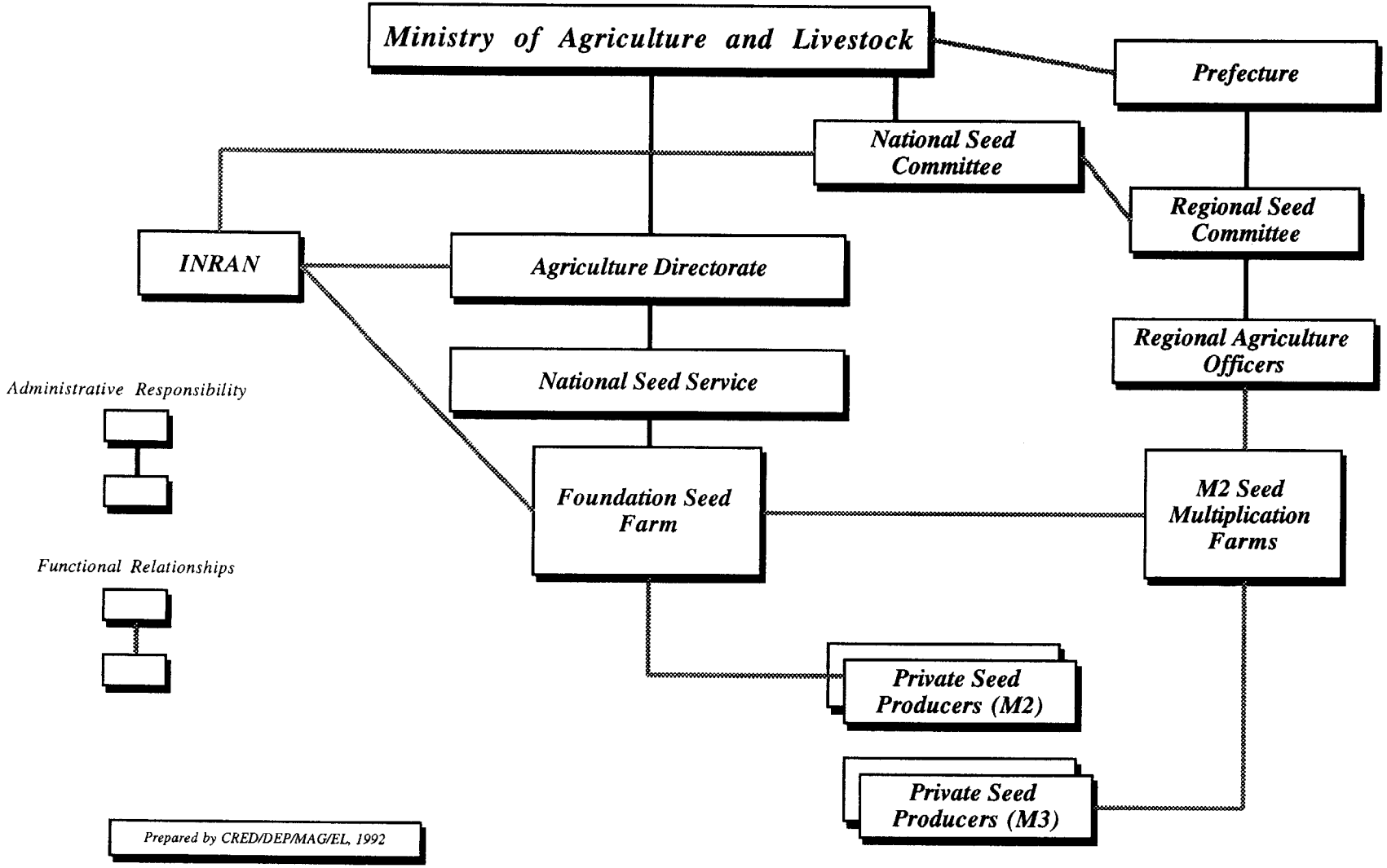
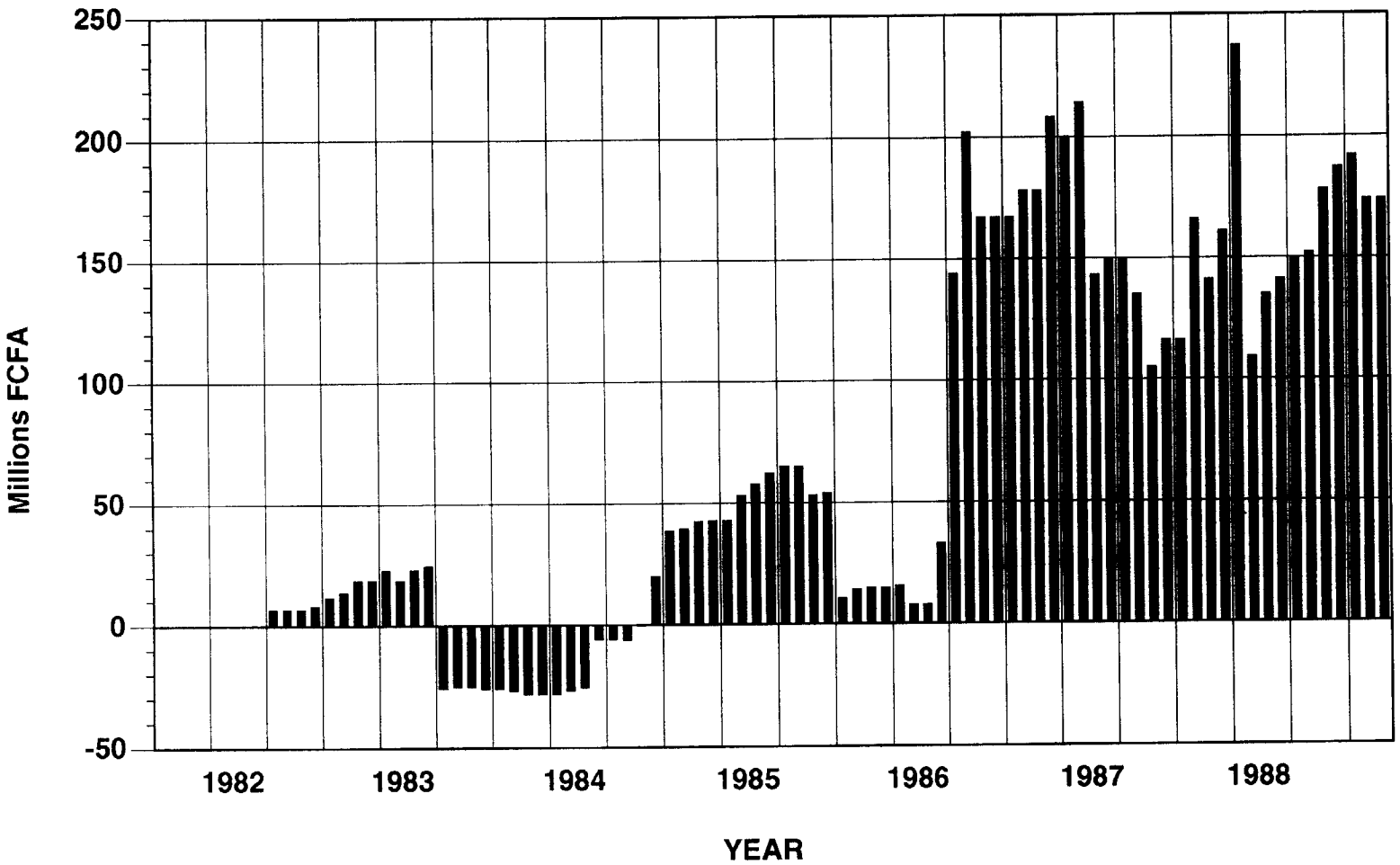
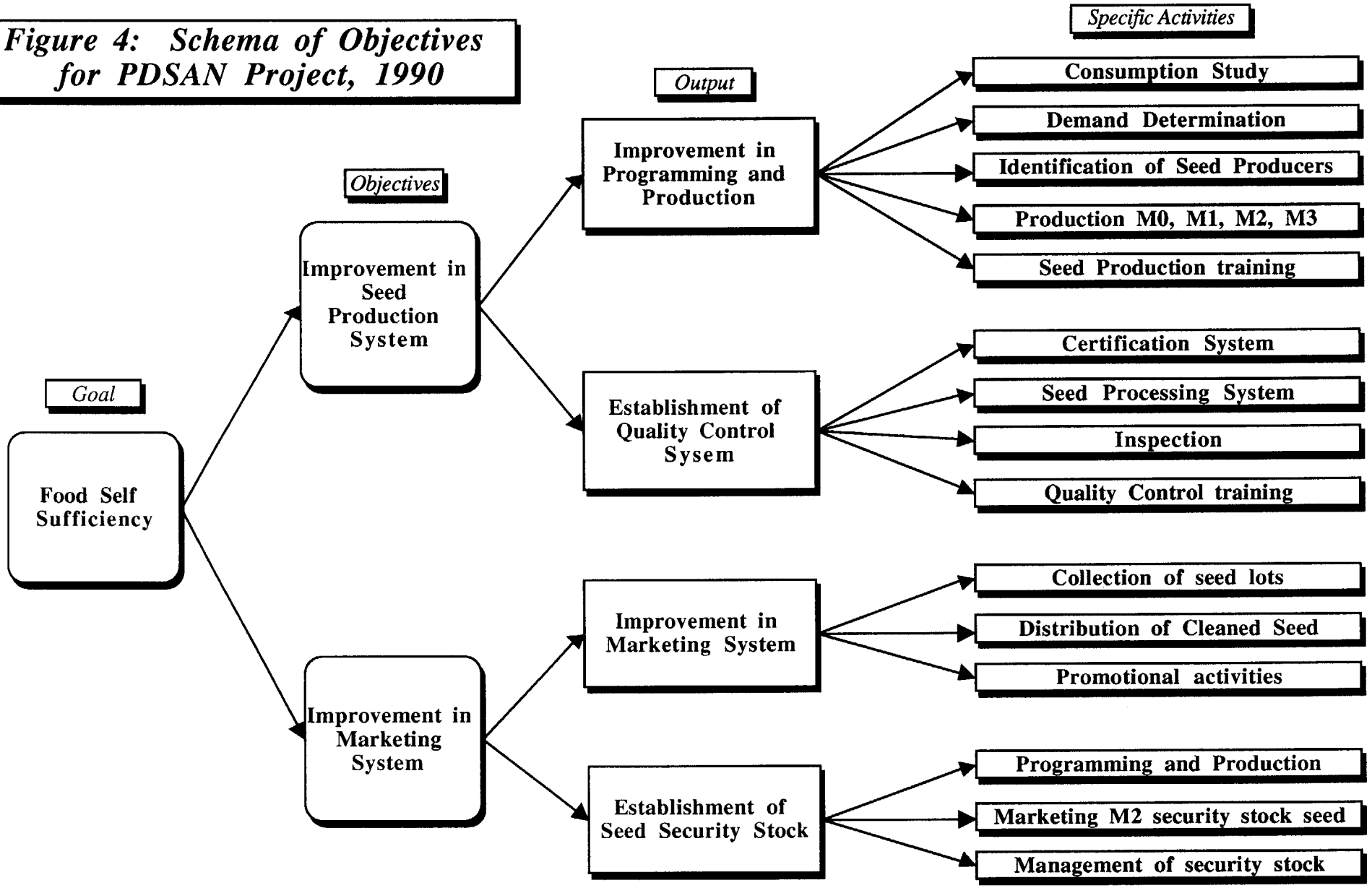


Figure 3: Evolution of Improved Seed Sales as a function of Deposits in the CNCA Bank, 1982-1988



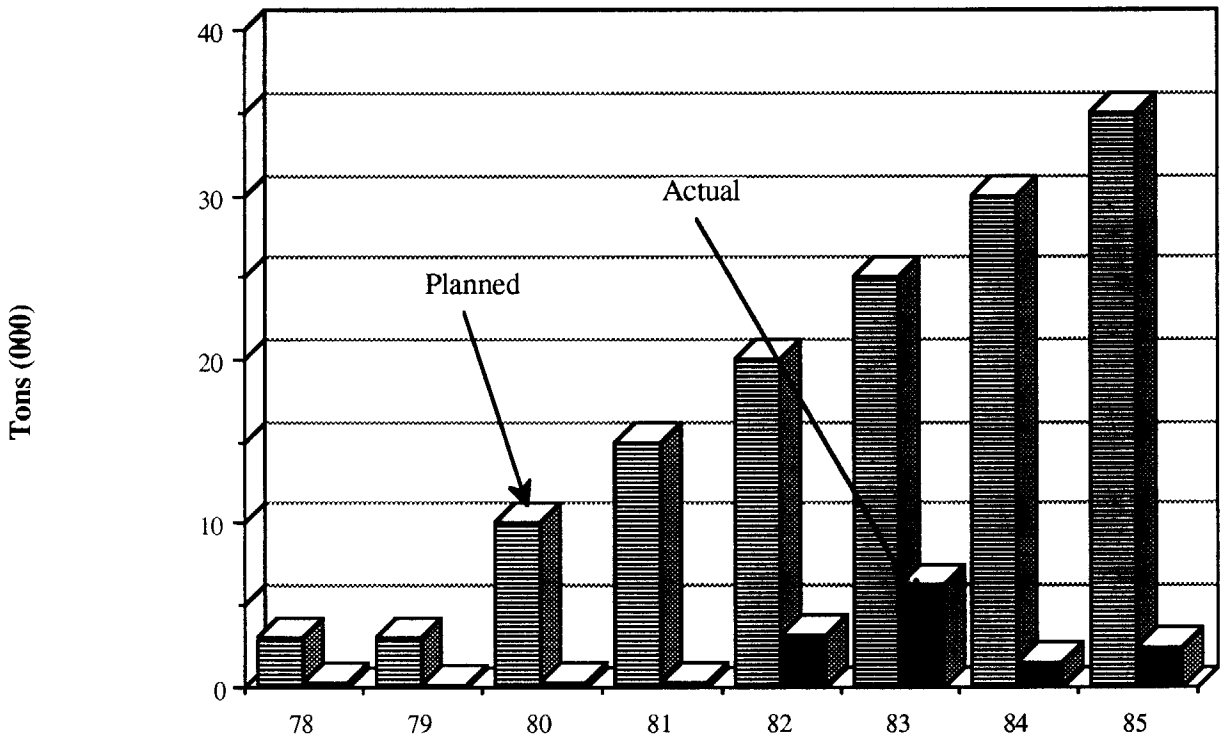
Source: Bank Statements CNCA SEED accounts
Prepared by: CRED/DEP/MAG/EL, April, 1992

Figure 4: Schema of Objectives for PDSAN Project, 1990



Prepared by: Dale Rachmeler, April 1992

Figure 5: Planned vs. Actual Production for all M3 Improved Seed, 1977-1985



Source: DPS/MAG, 1987

Figure 6: Cost of M1 Seed Multiplication for Millet and Cowpea, 1985-1988

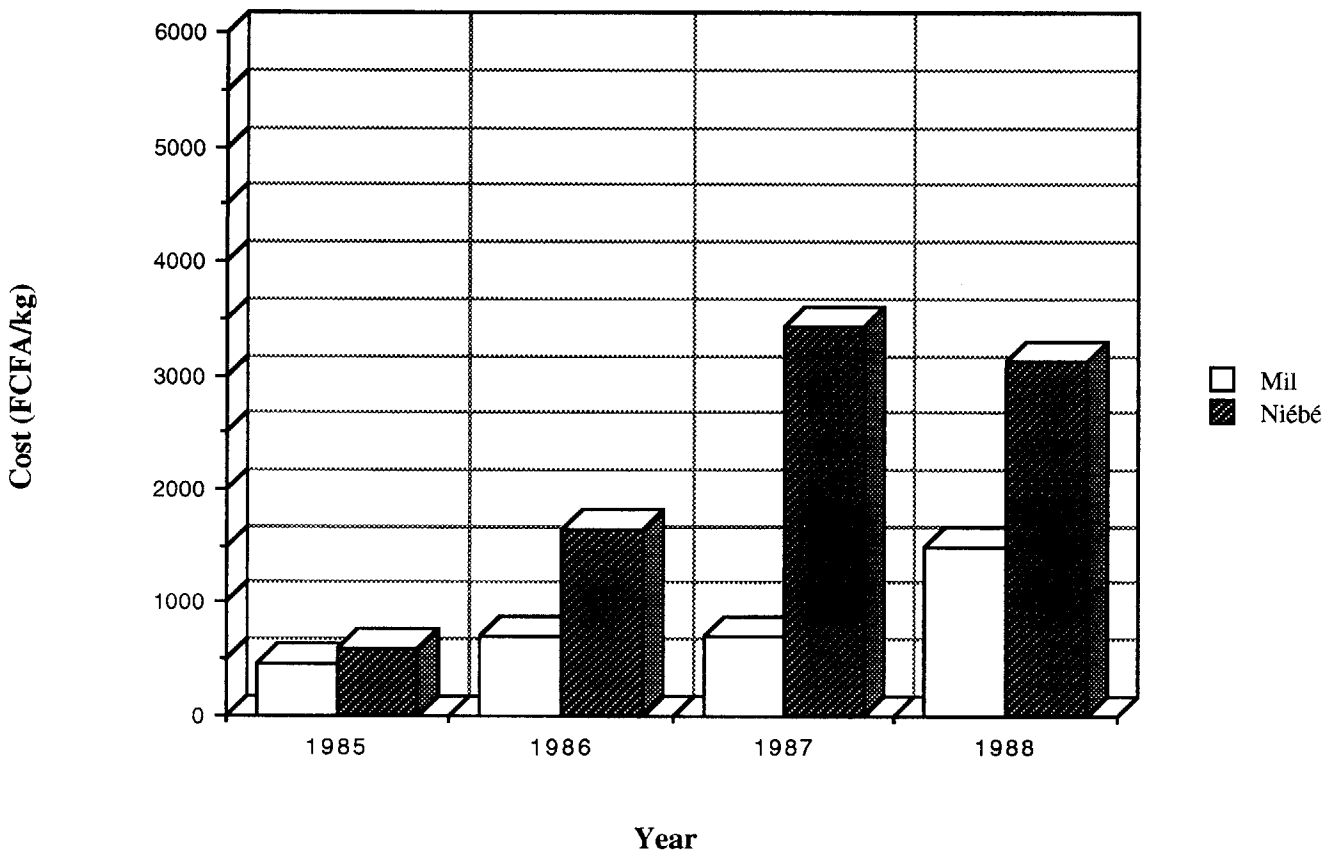


Figure 7: Operating Costs for M1 and M2 Seed Farms, 1985-1988

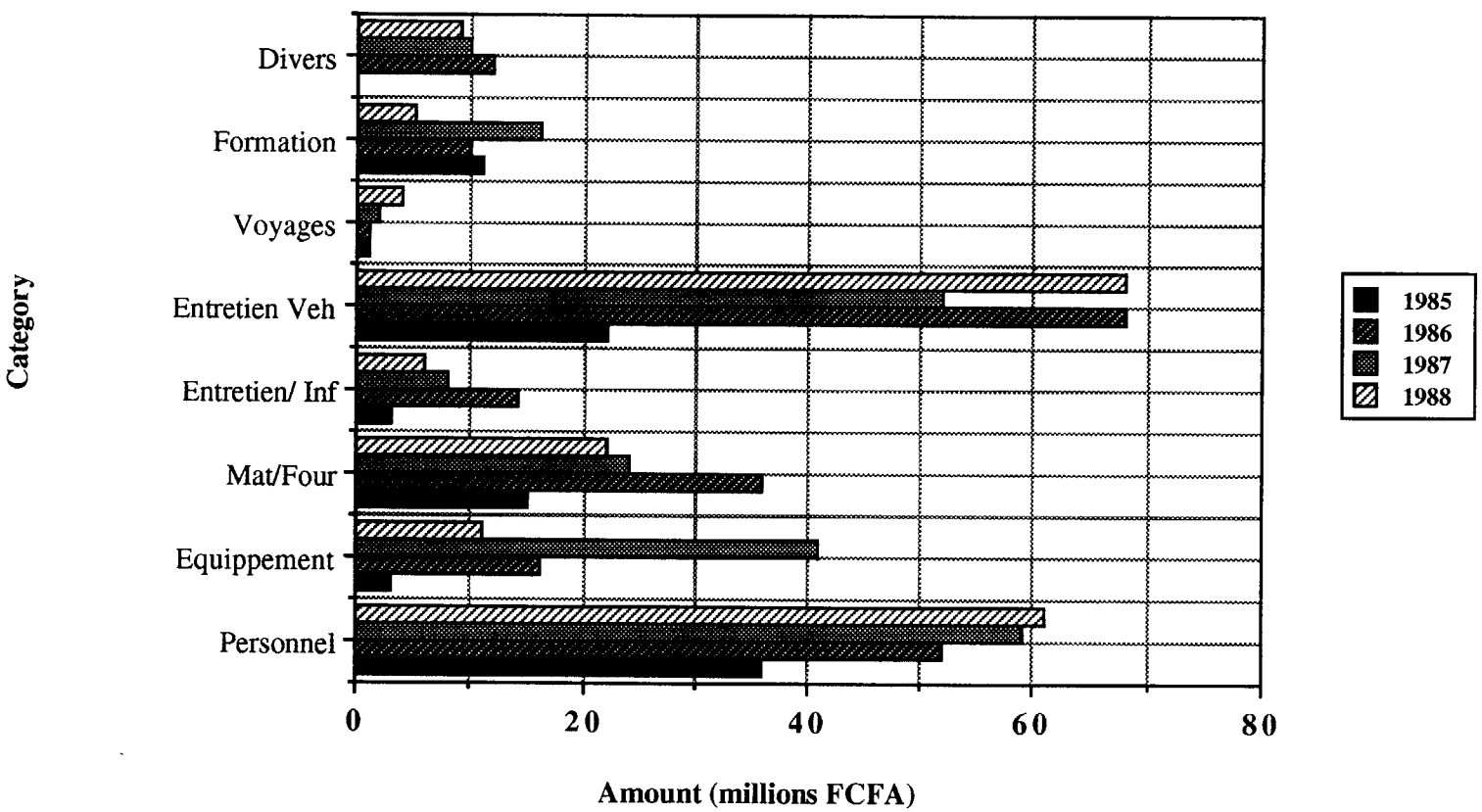
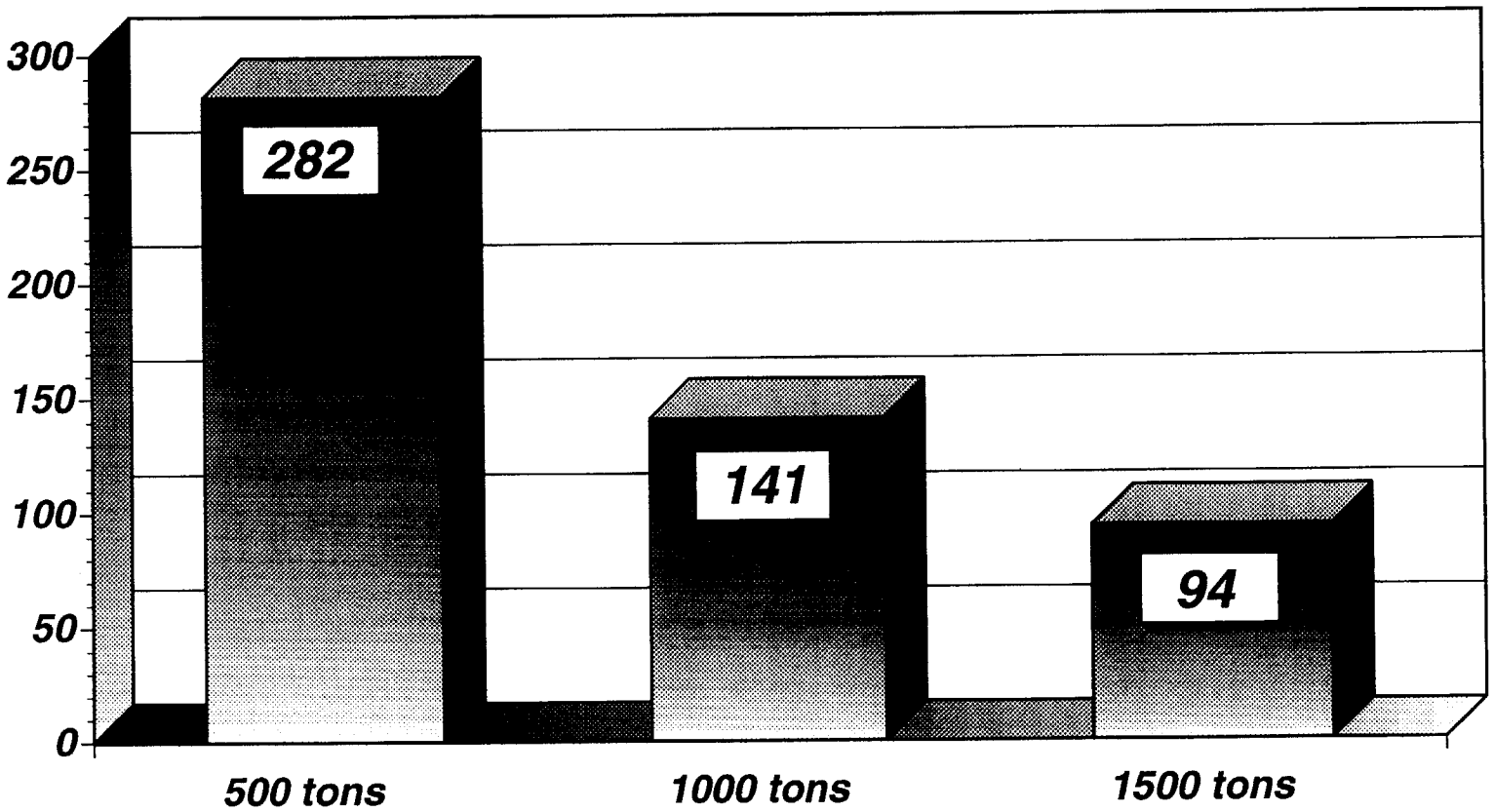


Figure 8: Cost of M3 Cereal Seed Production per Kilogram for three levels of Seed Sales



Costs for cereal seed production at the five M2 seed multiplication farms were averaged for the period 1983-1986. M3 cereal seed is usually sold for approximately 100 fcfa/kg.

Source: NCP/APS "Evaluation Interimaire du Volet Multiplication de Semences", 1987

Table 2: Area cultivated with Improved Varieties, 1988, 1989 (hectares)

	CIVT		P3 KOLLO		HKP		L30		CB5		TN 88-63		TN5-78	
	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989
Diffa Arrond.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maine-Soroa	0	0	0	0	0	0	0	0	105	0	0	0	0	0
N'guigmi	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIFFA	0	0	0	0	0	0	0	0	100	0	127	0	0	0
Boboye	16,930	7,517	0	0	82,768	0	0	0	0	0	0	0	0	0
Dogon-Doutchi	0	8,445	0	0	69,976	0	0	0	0	0	0	0	2,321	0
Dosso Arrond.	17,591	0	7,036	0	10,554	0	0	0	0	211	0	0	0	1,181
Gaya	9,100	0	2,275	0	4,550	0	0	0	0	0	1,132	0	566	510
Loga	0	4,253	0	0	65,212	2,127	0	0	0	0	0	0	0	0
DOSSO	49,174	16,225	8,196	0	251,334	2,318	0	0	0	282	3,441	0	3,441	2,936
Aguie	20,159	6,769	7,560	21,998	0	1,692	0	0	0	0	19,197	48,074	0	3,205
Dakoro	6,076	9,060	1,519	0	4,557	0	0	0	185	0	1,905	12,234	0	0
Guidam-Roumdji	59,337	0	14,834	0	0	8,060	0	0	0	0	57,008	13,577	1,629	5,431
Madarounfa	10,864	5,217	6,519	1,739	0	0	0	0	2,445	0	14,146	12,142	0	4,857
Mayahi	10,677	0	0	0	2,669	7,053	0	0	3,830	0	15,351	16,138	0	0
Tessaoua	3,344	0	0	0	10,033	0	0	0	0	0	23,192	43,144	0	0
MARADI	103,227	21,639	29,173	33,661	15,708	16,831	0	0	7,304	0	121,416	173,419	1,481	15,080
Birni-N'Konni	0	0	0	0	0	65,081	0	0	0	0	0	1,556	0	7,779
Bouza	0	0	0	0	0	57,728	3,632	0	0	0	0	0	0	0
Illela	0	0	0	0	1,648	59,159	0	0	74	0	0	0	0	0
Keita	6,905	0	0	0	0	33,577	0	0	824	0	0	0	0	0
Madaoua	0	0	756	0	13,613	59,556	0	0	410	0	0	0	1,375	715
Tahoua Arrond.	0	0	0	0	3,684	84,350	0	0	0	0	0	0	0	0
Tchin-Tabaraden	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TAHOUA	5,120	0	1,707	0	35,842	377,069	2,724	0	2,043	0	0	1,045	2,283	8,268
Filingue	0	0	0	0	144,996	30,672	0	0	0	0	2,142	0	2,142	0
Kollo	10,799	0	0	0	99,353	0	0	0	0	0	700	0	6,299	0
Ouallam	0	0	0	0	79,787	0	0	0	0	0	388	0	0	0
Say	2,793	0	0	0	9,777	0	0	0	0	0	0	0	0	139
Tera	0	0	0	0	111,296	2,673	0	9,216	0	0	5,217	0	0	0
Tillaberi	0	0	0	0	0	1,802	0	0	0	0	0	0	0	494
TILLABERI	21,376	0	0	0	451,958	38,090	0	5,321	0	0	6,525	0	10,875	2,310
Goure	0	0	0	0	0	0	0	0	0	0	0	1,167	0	0
Magaria	0	0	0	0	0	0	0	0	0	0	3,466	0	1,733	7,122
Matameye	0	0	21,918	4,236	0	0	0	0	0	0	2,503	13,423	0	0
Mirriah	0	0	0	57,910	0	0	0	0	0	0	2,687	158,330	0	0
Tanout	0	0	0	0	0	0	0	0	8,917	3,200	0	642	0	0
ZINDER	0	0	22,698	34,502	0	0	0	0	6,709	2,176	7,262	82,040	1,816	1,908
Niger Total	***178,898***	***37,864***	***61,773***	***68,163***	***754,843***	***434,308***	***2,724***	***5,321***	***16,156***	***2,458***	***138,771***	***256,504***	***19,894***	***28,502***

Source: Dale Rachmeler's improved seed demand survey

Table 1: Seed Use Frequency by Arrondissement by Variety by Year

	Millet						Sorghum		Cowpeas						N	N	Total Households		Total Rural Households	Cultivated Area
	CIVT		P3 Kollo		HKP		L30		CB5		TN 88-63		TN 5-78							
	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988	1989	1988		1988	1989
Diffa Arrond.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	17 239	17 808	14 446	14 923
Maïne-Soroa	0	0	0	0	0	0	0	0	2	0	0	0	0	0	65	55	17 693	18 277	14 827	15 316
N'guigmi	0	0	0	0	0	0	0	0	1	0	1	0	0	0	31	15	6 264	6 471	5 249	5 422
Diffa	0	0	0	0	0	0	0	0	3	0	1	0	0	0	178	150	41 196	42 555	34 522	35 661
Boboye	9	3	0	0	44	0	0	0	0	0	0	0	0	0	74	50	26 840	27 726	24 961	25 785
Dogon-Doutchi	0	2	0	0	20	0	0	0	0	0	0	0	1	0	59	44	41 138	42 496	38 258	39 521
Dosso Arrond.	5	0	2	0	3	0	0	0	0	1	0	0	0	1	39	94	31 193	32 222	29 009	29 967
Gaya	4	0	1	0	2	0	0	0	0	0	2	0	1	1	34	39	21 726	22 443	20 205	20 872
Loga	0	2	0	0	23	1	0	0	0	0	0	0	0	0	25	30	10 801	11 157	10 045	10 376
Dosso	18	7	3	0	92	1	0	0	0	1	2	0	2	2	231	257	131 698	136 044	122 479	126 521
Aguié	8	4	3	13	0	1	0	0	0	0	8	30	0	2	35	55	25 175	26 006	22 104	22 833
Dakoro	4	2	1	0	3	0	0	0	1	0	12	11	0	0	120	44	38 111	39 369	33 461	34 566
Guidam-Roumdji	24	0	6	0	0	3	0	0	0	0	35	5	1	2	70	55	28 041	28 966	24 620	25 432
Madarounfa	5	3	3	1	0	0	0	0	2	0	9	10	0	4	44	52	46 357	47 887	40 701	42 045
Mayahi	4	0	0	0	1	3	0	0	2	0	9	8	0	0	56	59	30 381	31 384	26 675	27 555
Tessaoua	1	0	0	0	3	0	0	0	0	0	9	28	0	0	37	71	32 360	33 428	28 412	29 350
Maradi	46	9	13	14	7	7	0	0	5	0	82	92	1	8	362	336	200 425	181 033	175 973	181 780
Birni-N'Konni	0	0	0	0	0	38	0	0	0	0	0	1	0	5	15	45	42 337	43 734	38 442	39 711
Bouza	0	0	0	0	0	73	4	0	0	0	0	0	0	0	49	94	30 335	31 336	27 544	28 453
Illela	0	0	0	0	1	28	0	0	1	0	0	0	0	0	64	43	30 002	30 992	27 242	28 141
Keita	3	0	0	0	0	11	0	0	1	0	0	0	0	0	27	21	24 789	25 607	22 508	23 251
Madaoua	0	0	1	0	18	41	0	0	1	0	0	0	3	1	88	58	35 921	37 106	32 616	33 693
Tahoua Arrond.	0	0	0	0	2	44	0	0	0	0	0	0	0	0	48	56	38 741	40 019	35 177	36 338
Tchin-Tabaraden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	16 254	16 790	14 759	15 246
Tahoua	3	0	1	0	21	235	4	0	3	0	0	1	3	6	295	317	218 379	150 515	198 288	204 832
Filingué	0	0	0	0	43	14	0	0	0	0	1	0	1	0	58	70	39 559	40 864	29 392	30 362
Kollo	5	0	0	0	46	0	0	0	0	0	1	0	9	0	71	44	95 226	98 368	70 753	73 088
Ouallam	0	0	0	0	26	0	0	0	0	0	1	0	0	0	35	50	21 487	22 196	15 965	16 492
Say	2	0	0	0	7	0	0	0	0	0	0	0	0	1	59	66	20 048	20 710	14 896	15 387
Tera	0	0	0	0	26	1	0	15	0	0	3	0	0	0	41	59	39 282	40 578	29 187	30 150
Tillaberi	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	40	23 071	23 832	17 142	17 707
Tillaberi	7	0	0	0	148	16	0	15	0	0	6	0	10	3	264	329	238 673	205 685	177 334	183 186
Gouré	0	0	0	0	0	0	0	0	0	0	0	3	0	0	44	108	34 330	35 463	30 039	31 030
Magaria	0	0	0	0	0	0	0	0	0	0	2	0	1	1	71	21	65 047	67 194	56 916	58 794
Matamèye	0	0	8	4	0	0	0	0	0	0	1	13	0	0	25	72	27 158	28 054	23 763	24 547
Mirriah	0	0	0	8	0	0	0	0	0	0	1	23	0	0	64	37	97 519	100 737	85 329	88 145
Tanout	0	0	0	0	0	0	0	0	3	1	0	4	0	0	48	43	36 516	37 721	31 952	33 006
Zinder	0	0	8	12	0	0	0	0	3	1	4	43	1	1	252	281	260 570	269 169	227 999	235 523
Niger Total	***74***	***16***	***25***	***26***	***268***	***259***	***4***	***15***	***14***	***2***	***95***	***136***	***17***	***20***	***1 582***	***1 670***	***1 090 941***	***985 002***	***936 595***	***967 503***