The Transfer of Irrigation Management to Farmer Organizations in Niger

Kurt A. Lonsway and Allahoury Amadou

INTRODUCTION

NIGER IS A vast landlocked African country covering an area of 1,267,000 square kilometers (km^2) situated between latitudes 12°N and 23°N. Over 600 kilometers (km) from the sea, Niger is located in one of the hottest regions on the planet. The Saharan and sub-Saharan desert constitute over two-thirds (71%) of the national territory with an annual rainfall varying between 20 and 250 millimeters (mm). In the central Sahelian Zone, rainfall fluctuates annually between 350 mm and 500 mm and is more favorable for livestock grazing than for agriculture. The Sudanian region in the South, covering 10 percent of the country's total area, receives between 500 mm to 850 mm annual rainfall and is the country's primary agricultural zone.

The recorded droughts of the 70s and 80s were particularly severe to agriculture and livestock in Niger. Arable land (12% of the total area of Niger) and land actually cultivated (2.5% of the total) are shrinking steadily due to a decline in fertility due to a lack of water, and progressive desertification.

IRRIGATION DEVELOPMENT IN NIGER

The first attempt at non-traditional irrigation development in Niger was reported to have taken place in the 1930s when the French developed several old river channels along the Niger River for peanut production (Norman, 1993). Most so-called modern irrigation schemes appeared after Nigerin independence from France in 1960. Traditional irrigation systems, used in the desert oases for centuries, still exist today.

To reduce the risks associated with traditional rainfed agriculture, the Government of Niger (GON) and donors actively promoted a policy of irrigation development. To attain food self-sufficiency in both rainfed and irrigated agriculture, the GON sought to ensure the following:

1) A dependable supply of basic cereals (millet, sorghum and rice) for the urban population and the rural population in food deficit zones at affordable prices.

2) Stable prices to producers for their agricultural products to stimulate production and to stabilize the rural population.

An estimate of the irrigation potential of Niger is about 270,000 hectares (ha) of which around 30 percent (81,000 ha) are currently being exploited. Irrigated production currently represents about 10 percent of total agricultural output (Figure 1).

TECHNICAL CHARACTERISTICS

Along major water sources in Niger, water delivery for irrigation is done using small-scale hand lifting techniques to large-scale pumping stations. The hydraulic gradient of the rivers and adjacent surface topography do not permit gravity-fed irrigation without major dam construction. One such option, the construction of the Kandadji Dam across the Niger River within Niger borders, remains a long-term GON objective.

Irrigation schemes range from small- or micro-scale systems, that employ hand or animal lifting to irrigate small gardens, to larger-scale agency-managed systems. The general size of Nigerin irrigated systems range from several hectares to over 2,000 ha with an average size along the Niger River estimated at 200 ha. Most larger schemes along the Niger River receive water from electric powered pumping stations. Static lift varies from 1-5 meters with design discharges to provide 3 liters per second per hectare over an irrigation period of 16 hours per day.

To counter the long-term decline in staple crop yields, the GON has included irrigation (both small- and larger-scale) into its long-term development strategy. Irrigation development along the Niger River has primarily been for rice production on the heavier clay basin soils. Vegetable production is done on the lighter, more sandy terrace soils. In the interior of Niger, wheat, cotton, onions, peppers and a variety of other high-value cash crops can be found.

SOCIOECONOMIC CONTEXT

Niger is made up of a mosaic of different ethnic groups: Haoussa (55.6%) concentrated in the center of the country along the border of Nigeria; Zarma-Songhay (22.5%) located along the Niger River in the principal centers of Niamey, Dosso and Ouallam; Fulfuldes (8.49%) Puehl subgroup of which 80 percent are nomads; Touaregs (7.49%) nomads of Berber origin intermixed with Arab and Black African ethnic groups located in the Azawak and Aïr regions; Kanouris (4.31%) located in the southeast of Niger (Kongo, 1993).

Niger is among the poorest countries in the world. The estimated Gross National Product per person is at US$261 per year. Agriculture accounts for roughly 40 percent of Gross Domestic Product. Average landholding sizes are difficult to determine and vary considerably depending on location and specific agricultural activity practiced.

BASIS OF THE COOPERATIVE MOVEMENT

Until recently, the GON, with significant donor assistance, invested considerable resources to develop irrigated agriculture. One precondition was the requirement that farmers organize into irrigation cooperatives to exploit GON supported irrigation schemes. Thus, strictly speaking, the cooperative movement does not emanate from the farmers themselves.

Prior to 1982, two government agencies worked with irrigation cooperatives in Niger: "Union Nigérienne de Crédit et de Cooperation" (UNCC) and the "Office National des Aménagements Hydro-Agricoles" (ONAHA).

The mission of the UNCC was to promote the cooperative movement throughout Niger, establish cooperatives according to standard organizational norms and to provide necessary training and economic support. The UNCC directly helped cooperatives in the marketing of agricultural products, establishing cereal stores, purchase of inputs and processing, with the financial backing of the "Caisse Nationale de Crédit Agricole" (CNCA). After a national seminar held in Zinder in 1982 on the "Stratégie d'intervention en milieu rural," (Strategy for rural intervention) it was decided that the UNCC and other related organizations should reorganize to more effectively promote cooperative self-management. This new structure is shown in Table 1.

Agricultural cooperatives come under the direction of the Ministry of Agriculture and Livestock. A representative example of how a typical irrigation cooperative is organized is shown in Figure 2.

ONAHA was created in 1979 and works exclusively with irrigation cooperatives on GON financed schemes. The principal activities of ONAHA were to (1) implement, manage and maintain the irrigated systems; (2) supply inputs to farmers; and (3) provide extension services. Through its ONAHA System Director, it elaborated seasonal cropping calendars, set operating fund requirements, determined and collected "redevance" or user fees, and proposed disciplinary action and imposed sanctions on errant cooperative members. ONAHA received a percentage of the user fee for its services.

IRRIGATION POLICY CONTEXT

An unfavorable socioeconomic environment persists in Niger. Land tenure, credit availability, and marketing potential are seriously lacking. Given the current GON tendency to withdraw from supporting agency-managed schemes due to lack of financial resources, farmers complain that the transition is occurring too abruptly without sufficient attention paid to how they will assume certain responsibilities previously ensured by the GON.

To date, GON withdrawal from irrigation support activities did not foster development of the private sector or other means to supply inputs, equipment or maintenance services that will be required to guarantee the operation and ultimate survival of the irrigation schemes. This is especially true for credit. Most financial institutions and banks in Niger are either not interested or not prepared to extend small loans to farmers. The GON and donors are attempting to address this problem but have found no acceptable solution to date. This problem is further exacerbated because the irrigation cooperative itself does not yet have the legal standing necessary to obtain credit.

Another major problem is the tendency of the GON to withdraw from supporting irrigation without managing to transfer enough of the cost of operation to the cooperatives. While farmers should pay most actual crop production expenses, the cost of water and system maintenance, they are increasingly reluctant to continue paying other administrative and support costs to ONAHA.

In theory, the GON expects farmers to cover depreciation costs, investment renewal, and certain administrative, training and extension expenses. In practice there are few cooperatives that can meet this expectation. Farmers appear either unable or reluctant to set aside funds for depreciation and renewal of investments if they cannot obtain credit or generate sufficient operating funds. ONAHA's capacity to provide certain administrative, training and extension services has significantly declined since 1989. With the restructuring of ONAHA underway, it is hoped that most of this support capability (less construction services) will be eventually restored.

To secure the rice production market, clearly the GON, urban consumers or donors must subsidize production costs at some level. While conventional wisdom often states that irrigated rice production in the Sahel (including Niger) is non-competitive, conventional wisdom fails to explain why irrigated rice production in the Sahel remains an attractive production strategy for farmers and continues to expand in the Sahel.

To implement policies that promote and justify local rice production, clearly certain measures will need to be applied. One such measure is that imported rice needs to be appropriately taxed. The GON currently levies a 25,000 fCFA/metric ton tax on imported rice and an 8,000 fCFA/metric ton tax (pre-devaluation prices) on rice in transit through Niger destined for neighboring countries. Unfortunately, this rice frequently ends up in the local market with subsequent loss of tax revenue for the GON. The GON also requires private companies seeking a rice import license to guarantee purchase of a percentage of local production (reported at 20%). Unfortunately this regulation too is often circumvented.

A second measure is to continue to subsidize local rice producers or urban consumers, or perhaps both. Given the prevailing economic difficulties in Niger and reluctance by many donors to provide sufficient funds, it is unlikely this will be an acceptable option.

Nigerin law currently specifies that all land belongs to the state. Despite the presence of traditional land tenure rights, the GON has the right to expropriate land to develop irrigation schemes. Priority in irrigated parcel redistribution is usually given to former land holders (owners), the size of which is often dependant on traditional standing and family size. Official policy requires that all irrigation schemes be organized as cooperatives with self-management as the ultimate goal (Norman, 1993).

Until recently, official GON policy emphasized a range of irrigation development strategies. Although ONAHA still maintains an interest in the larger-scale irrigation schemes, there is a current trend toward promoting smaller-scale irrigation. Donors are also moving rapidly away from supporting larger-scale activities. Among the traditional ONAHA donors, only the European Development Fund (FED) and the French Development Fund (CFD) remain in any significant capacity. Japan recently funded the construction of a sophisticated workshop that is mostly underutilized due to lack of ONAHA construction opportunities. This workshop will most likely by used for other GON purposes or privatized if a suitable arrangement can be agreed upon with the donor. The World Bank recently rekindled interest in a small-scale irrigation project but the question on how best to provide and manage credit is delaying project implementation.

Since 1982, the self-management of irrigated system has been an important component in the GON irrigation development strategy. ONAHA is naturally called upon by the state to play the major role in its implementation (Norman, 1993).

SELF-MANAGED IRRIGATION IN NIGER AND IMPLEMENTATION

The transfer of responsibilities to farmers organized into cooperatives is based on several principles that came out of the national seminar on rural intervention strategies mentioned earlier [(Zinder, 1982)]. The basic principles for self-management are the following:

1) Selection criteria for cooperative leaders at all levels are defined by the general assembly based on democracy, representation, conviction and competence.

2) Cooperatives will consider the option to remunerate their leaders if justified.

3) Emphasis on training, information dissemination, and cooperative animation especially concerning economic activities.

4) Cooperatives will consider recruiting competent administrative assistance when necessary.

5) Promotion of rural savings with a goal to developing the practice of extending mutually guaranteed credit.

ONAHA is the agency responsible for implementing the program to transfer these responsibilities to irrigation cooperatives. Following the Zinder seminar, ONAHA created a training program to facilitate the development of the cooperatives. After 1983, ONAHA began to transfer the following responsibilities to the cooperatives:

1) Management of agricultural inputs.

2) Land preparation using animal traction.

3) Management of seasonal credit and operating funds.

4) Construction and management of communal nurseries.

5) Management of water distribution.

6) Primary maintenance of irrigation infrastructure.

7) Calculation and recovery of fees.

6) Marketing of the crop.

To help cooperatives acquire independent management capacity, a transparent and simple accounting system was introduced. Intensive training programs centered on the management of cooperatives helped facilitate this transfer.

To promote the progressive disengagement of cooperatives from the state and to convince the GON to stabilize the cooperative environment, a package of contracts and conventions was established between the principal actors concerned by the irrigated systems (GON, ONAHA, cooperatives, parastatals, etc.). Over seven years (1983-1990); the cooperatives assumed more responsibility and became more independent. The activities previously cited are now totally assumed by the cooperatives.

In the older systems, ONAHA plays the role of a technical catalyst in training activities (irrigation and agriculture techniques, seasonal planning, cooperative management, etc.). In newer systems, the transfer phase lasts two years. During this two-year period everything is put into place so that at the end the transfer can be effective. The principal actions put into place are:

1) Technical training by a system manager and one or several assistants.

2) Intensive training program centered on cooperative management and agricultural techniques.

3) Clear and simplified accounting documents (cash transaction journals, bank account journals--both current and reserved, fee recovery journal, individual forms, etc.).

4) Accompanying actions (in certain instances depending on the wishes of the donor) indirectly tied to system management that could engender supplementary revenues (mills, cereal warehouses, firewood, etc.).

Relevant Nigerin experiences in transferring responsibilities for the management of irrigated agriculture to cooperatives are:

1) The progressive introduction of an appropriate contractual relationship between the cooperative and the different actors (GON, training services, marketing and processing companies, suppliers, producers, etc.).

2) Acquisition of new and unique organizational structures, for example the creation of specialized teams responsible for coordinating land preparation and planting.

3) Constitution of monetary reserves by emphasizing progressive responsibility for recurrent charges tied to the exploitation of systems and to depreciation.

4) Acquisition of a simple and clear accounting model acceptable to the producer.

Remaining obstacles to management transfer are:

1) Investment and high operation costs.

2) Undefined and insecure land tenure rights.

3) Bureaucratic behavior of trainers.

4) Dualities that exist between cooperative structures and traditional structures.

5) Absence of a price policy to provide guaranteed monetary revenues to producers.

6) Absence of a permanent credit system.

7) Lack of socioeconomic infrastructure in terms of storage, the transformation of products and the geographical isolation of certain production zones.

8) Technical competence in irrigation of farmers is still low except in the northern part of the country (desert oases).

9) Absence of a legal system indispensable for cooperative existence.

RESULTS OF MANAGEMENT TRANSFER OF IRRIGATION SCHEMES

Due to self-management, or transfer of responsibilities to cooperatives and the clarification of roles between cooperatives and ONANA, the following problems and progress are apparent:

Use of Irrigation Infrastructure

Although preliminary results were somewhat discouraging, it was hoped that there would be more progress made in the organization, distribution and cost savings of water. But in practice, there is evidence of overuse of water, from 14,000 to 20,000 cubic meters per hectare per season compared to a theoretical need of only 12,000 cubic meters per hectare per season. This significantly increases pumping costs, making it the principal operation cost (up to 60% for some systems).

The tertiary canals that constitute the last part of the system before the parcel, are somewhat well maintained. All other canals that require collective intervention, are not maintained in a systematic way, resulting in a rapid degradation of the overall system. Water management is chaotic despite the introduction of a planned water distribution schedule. This causes frequent conflicts between farmers over how to manage water.

Agricultural Productivity

The transfer of responsibilities to farmers through self-management and self-training has resulted in spectacular progress in mastering technical skills that directly translate into productivity gains.

This has resulted in the following:

1) Annual double cultivation of rice is consistent (200% cropping intensity).

2) Rice transplanting techniques are consistent, the transplanted areas grew from 3,000 hectares in 1982 to 6,700 hectares in 1989 (an increase of 223%).

3) Noticeable average yield increases (from 4 tons per hectare in 1980 to 5 tons per hectare in 1989). The dispersion of yields is weak (11% gets less that 4 tons and 70% between 4 and 5 tons) (see Figure 3).

4) Animal traction has replaced the use of tractors, and has resulted on the one hand in a considerable reduction of land preparation costs, and on the other hand a mastery of the cultivation calendar by the farmer (therefore reducing the length of the season).

Financial and Physical Sustainability of Self-management

The management accounting system put into place appears to be functioning at the level of the cooperative and the farmer. The introduction of a contractual relationship has helped stabilize the system. This should ensure a healthy, transparent and coherent arrangement. Yet viable self-management is not yet completely realized due to the following problems:

1) Drying up of operating funds placed at the disposal of the cooperative. These funds, normally to be used as an advance to meeting seasonal charges, are often used to cover poor marketing returns or fee recovery arrears.

2) Rate of fee recovery (needed to cover collective costs) is weak.

3) Marketing of products is poorly mastered. Informal sales outside the cooperative structure are significant, which make recovering fees difficult.

4) Prescribed sanctions by regulatory texts (internal regulations, contracts, etc.,) are not always applied, which provokes a laxity of discipline on the systems.

Impact of Transfer on the Production System

Beyond irrigated agriculture (parcels from 0.25 ha to 0.75 ha per family), the production system includes rainfed agriculture (an average of 2.5 ha per family). The traditional production system can be characterized by assessing the different morphopedological similarities of the areas in question. The traditional training in irrigated agriculture of the autocratic style totally neglected the original nature of the farmer production system. With the transfer of management responsibility, the producer regains independence and the initiative that will allow him or her to manage the entire production system, by integrating irrigation. The actual situation is therefore more rational than the preceding, in respect to the farmers' own objectives.

Impact on the Environment

The absence of discipline in water management has resulted in poor drainage, which translates into observable salinization on certain soils, and a permanent inundation of certain parcels or it results in the loss of irrigated land.

CONCLUSION

The principal aspects favoring management transfer of irrigation schemes in Niger are the following:

1) Political will of the government to organize all producers into cooperatives.

2) Political desire of the government to transfer system management responsibilities to cooperatives. This desire was manifested by the organization of a national seminar on rural intervention strategies [(Zinder, 1982)]. During this 15-day seminar, the participants developed a transfer framework, a strategy to be put in place and an implementation schedule.

3) Existence of a specific training structure for the irrigation sector (ONAHA). This structure has played an essential role to advise, support and train producers, which has been translated into a progressive introduction of farmer self-training to manage the entire activities of the cooperative.

4) Putting into practice a contractual policy. The systems are exploited under a framework of contracts (cooperative-ONAHA/cooperative-farmers). The success of self-management for many will be due to the application of the terms of these contracts.

5) The arbitrating role and judgement of the administration, which was sufficiently firm in the resolution of most lawsuits (complaints).

Table 1. Cooperative organizational structure in Niger.

Geographical level	Village	Canton	District	Department	National
Cooperative Movement	Cooperative Mutual Production Group (MPG)	Local Cooperative Union (LCU)	Sub-Regional Cooperative Union (SRCU)	Regional Cooperative Union (RCU)	National Cooperative Union (NCU)
Movement Cooperative	Groupement Mutualiste de Production (GMP) Cooperative	Union Locale Cooperative (ULC)	Union Sousregionale Cooperative (USRC)	Union Regionale Cooperative (URC)	Union Nationale Cooperative (UNC)

References

Norman, W. Ray and Walter, Michael F. 1993. Government-sponsored irrigation in small systems of Niger. Winrock International Institute for Agricultural Development. Development Studies Paper Series.

Kongo, Gbiatene. 1993. Rapport de l'étude du processus d'intégration de la femme Nigérienne dans le secteur agricole moderne situé le long du fleuve Niger: Le cas du périmètre irrigué de Tillakaïna. Université Abdou Moumouni Diofo, Faculté d'Agonomie, Département de Sociologie et Economie Rurales, en Collaboration avec l'Insitut International du Management de l'Irrigation.

Legoupil, J.C. and Pouya, A.M. 1994. Self-management of irrigation systems: The farmer cooperatives in Niger. Bulletin du Réseau Irrigation Afrique de l'Ouest (BRIAO). Vol. 4. ISSN 1017-110X:19-23.

CRED/DEP/MAG/EL. 1992. La situation du Niger à long terme en graphique. Niamey, Niger: Ministry of Agriculture and Livestock.

Figure 1. Map of irrigable area, Niger.

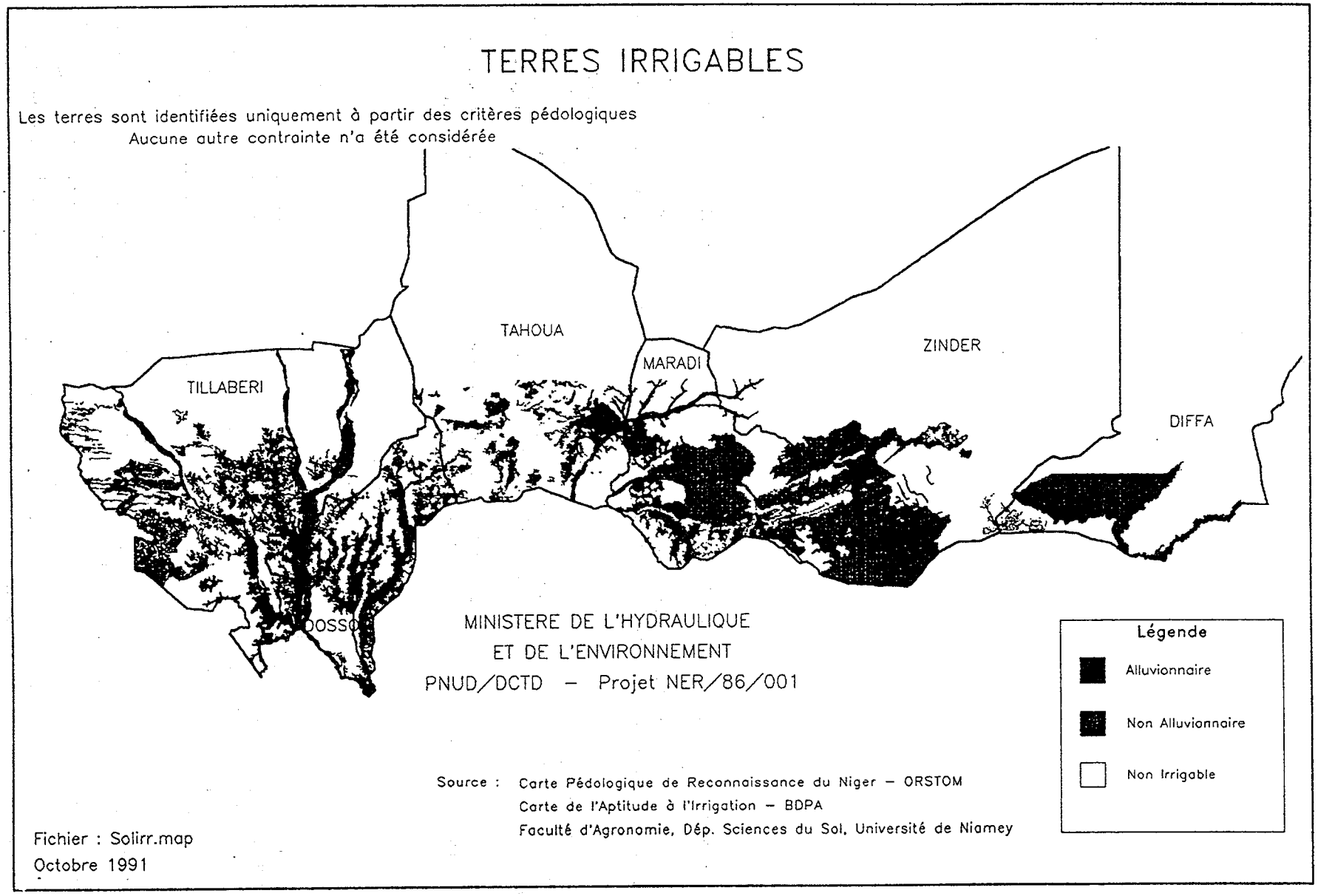


Figure 2. Typical organization of a Niger Irrigation Cooperative.

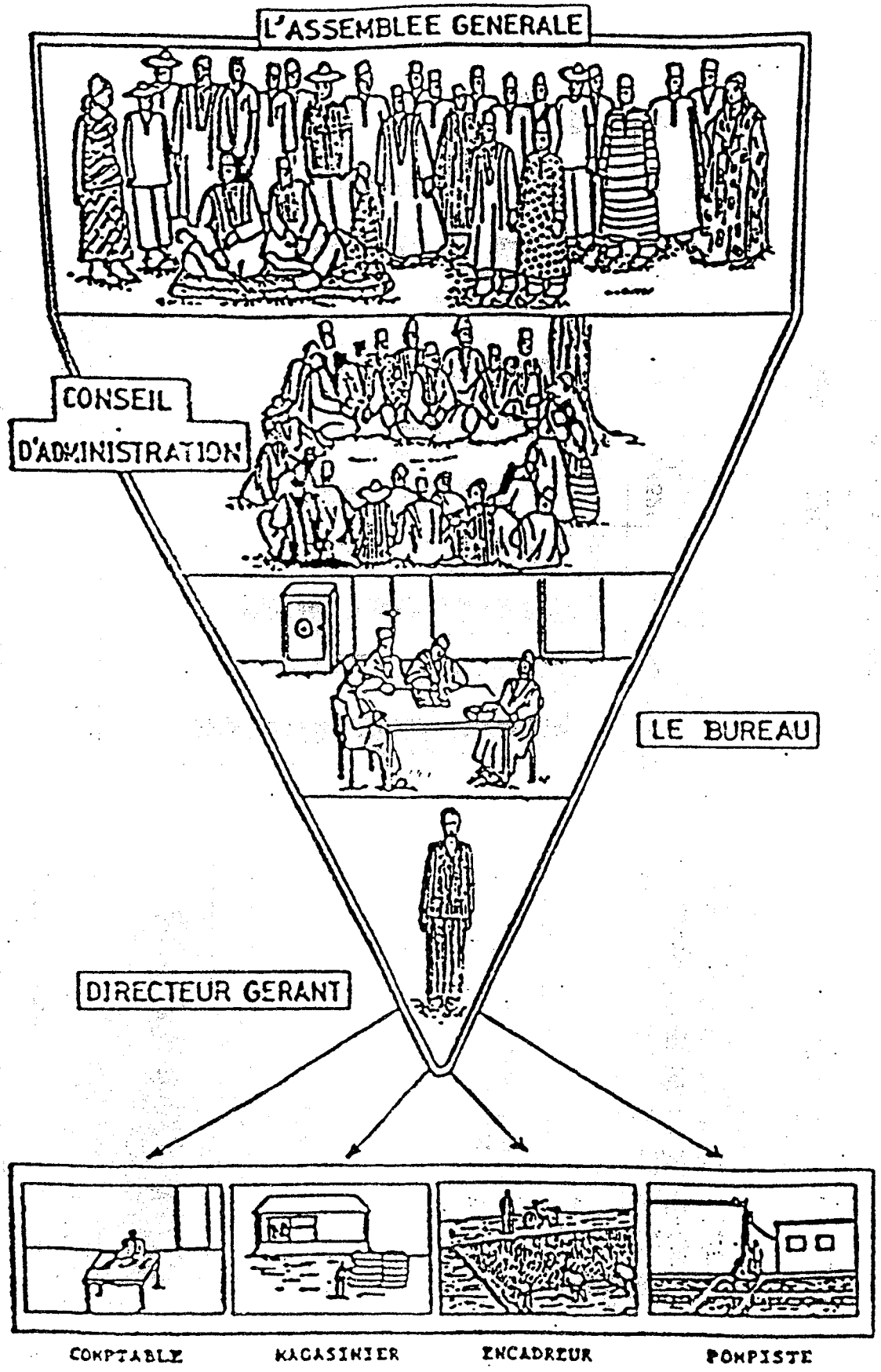
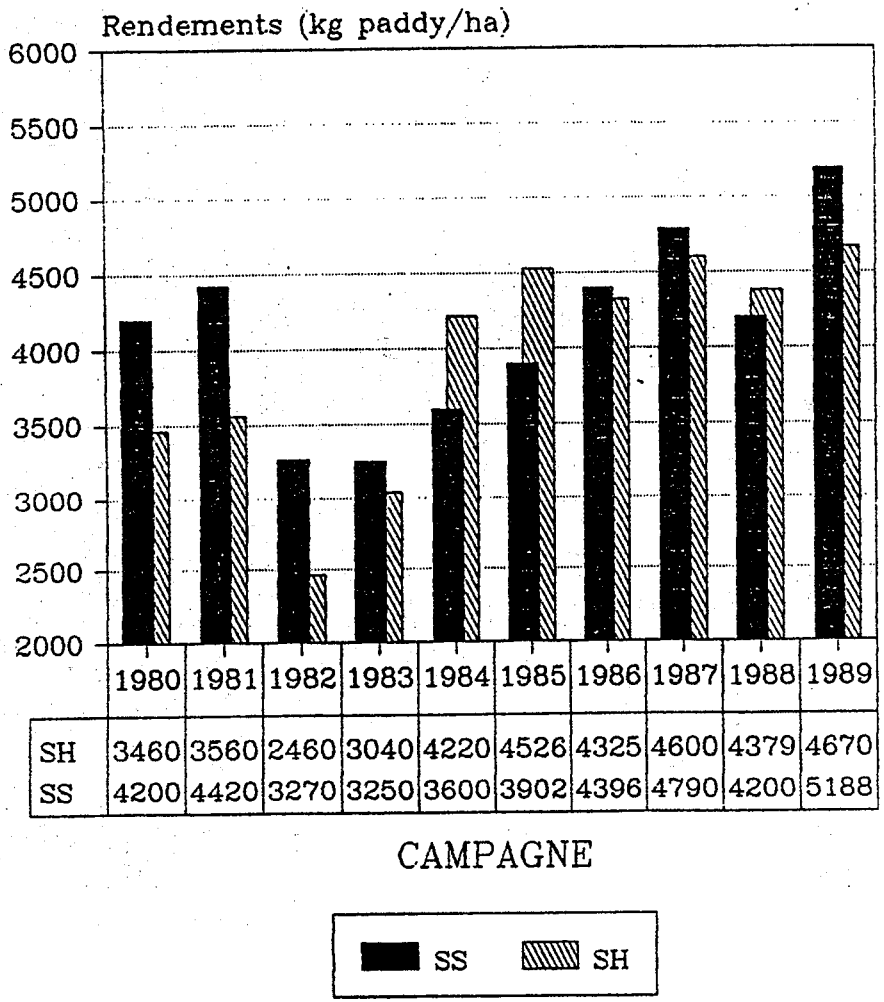


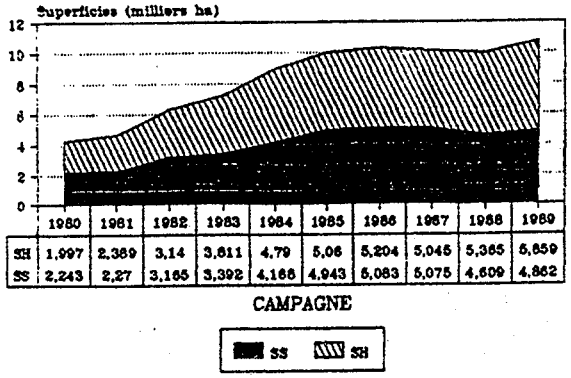
Figure 3. Rice yields, irrigated rice area and rice production, 1980-89.

RENDEMENTS 1980–89
Coopératives rizicoles



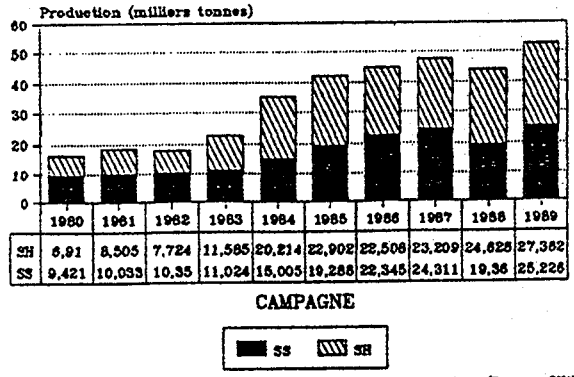
Suivi–Evaluation ONAHA –BP 10 697 Niamey

AMENAGEMENTS IRRIGUES 1980–89
Superficies rizicoles



(Source : ONAHA)

PRODUCTIONS RIZICOLES 1980–89
Aménagements irrigués



(Source : ONAHA)