

Financing family rice farming to improve performance of large dams



KEY POINTS

- Governments need to improve access to seasonal credit if they want a return on investment in large-scale irrigation for rice farming.
- Producer organisations have an equally important role to play, but a lack of legitimacy and of organisational and management capacity limits their ability to respond to farmers' needs.
- To be effective, a credit system has to enable producers to withstand a poor farming season and must take account of market delays which impact on the following season. Failures in risk management, rather than lack of bank guarantees, are the major obstacle to less well-off farmers getting access to credit.
- To limit financing needs and improve incomes, agricultural research and extension must prioritise the development of less costly rice cultivation systems and practices.

Large dam-irrigated rice cultivation projects are only justifiable if producers can obtain high yields. To do this, they need to adopt rice varieties with high genetic potential and make intensive use of fertilisers and pesticides. The majority of small producers do not have access to credit to purchase all the inputs required and this leads them either to reduce the area they farm or to apply the inputs at lower than recommended levels. As a consequence, the overall results of these large schemes usually fall short of expectations, with some producers performing very poorly. But experience suggests that seasonal credit for rice farming can be viable, provided that risks are covered and that all stakeholders are involved in researching appropriate solutions.

Irrigated rice farming – a capital-intensive system

Irrigation schemes at Sélingué (Mali), Bagré (Burkina Faso) and Niandouba (Anambé river basin, Senegal) have been analysed as part of the Global Water Initiative (GWI). These three schemes were designed for intensive rice cultivation, a production model with the classic objectives of increasing cereal supply and securing national self-sufficiency in food.

Irrigated rice is a demanding crop in terms of financial capital. "Improved" seeds developed in the Green Revolution require high levels of agricultural inputs such as fertilisers and herbicides to produce high yields. In addition, farmers have to be able to afford the costs of water distribution charges (for pumps and for the management and maintenance of infrastructure), of services such as soil preparation, threshing, and transport of rice if they do not own the full range of equipment needed, as well as paying the wages of casual labour hired at peak times, for tasks such as transplanting and harvesting.

By contrast, the farming systems which existed before the development of irrigation were essentially extensive rain-fed systems with low input costs. To develop intensive irrigated rice cultivation, governments have had to establish a range of services in the dam project areas: technical support and advice, input supply

chains, structures for accessing agricultural equipment, and distribution channels for rice transformation and marketing. The sale of rice was initially controlled by governments, so they were able to recoup their advances on the costs of production (at least partially) from the prices paid to producers for their crops at harvest.

The need for agricultural credit in the wake of the state's withdrawal

In the late 1990s, structural adjustment policies led to the disengagement of governmental structures from production, giving way to farmer organisations and private operators who were supposed to provide these support services to producers. In Senegal, the liberalisation of the rice sector in the early 1990s was affected by the devaluation of the CFA Franc and the abolition of the central price control board (*Caisse de péréquation et de stabilisation des prix*). At the local level, liberalisation meant a changed role for the Society for Agricultural and Industrial Development in Senegal (SODAGRI – *Société de Développement Agricole et Industriel du Sénégal*) which had been responsible for the supply of inputs and services to producers and was the sole purchaser of local rice production.

This partial or total withdrawal by governmental development agencies from providing inputs and services as advances against harvested production left producers

dependent on private suppliers, whom they now had to pay in advance.

As Table 1 shows, the costs of production are high, at around 400,000 FCFA or 600 Euros per season. These largely have to be pre-financed. A season's net income, at around 200,000 FCFA, is therefore not enough to enable producers to finance the following season's farming.

With the dismantling of state structures, specialised agricultural banks were established such as the national agricultural credit banks (CNCA – *caisses nationales de crédit agricole*) and national agricultural development banks (*banques nationales de développement agricole*). Their role was to provide seasonal farm credit, but repayment rates were so low that they jeopardised the viability of many of these banks. Structural adjustment led governments to implement more restrictive credit policies, and banks to place more emphasis on risk avoidance measures. Some banks failed, and others severely limited their involvement in the agricultural sector, or even withdrew from agricultural credit altogether.¹

Table 1. Costs of production and income per hectare of irrigated rice, Bagré, 2013 (in FCFA)

Production costs per season	Bagré, 2 farming seasons	
	Without animal traction	With animal traction
Total income	540,000	600,000
Inputs	178,500	225,500
Services	193,000	113,000
Water fees	30,000	30,000
Total production cost per ha.	401,500	368,500
Net income per ha.	138,500	231,500

Box 1. Farming risk and credit repayment

In Anambé in 2002, unseasonal rains in January led to harvest losses and low repayment rates of only 33% of a total of 93 million FCFA of loans. In the absence of an agreement with the government to unlock disaster funds and therefore enable a moratorium or compensation for debt repayments, Senegal's CNCA withdrew completely from the rice farming sector.

In Bagré in 1998, producers took on loans for inputs and equipment which coincided with two successive bad years in 1998 and 1999 caused by the introduction of a rice variety whose technical requirements were not mastered and which led to very poor harvests. Some farmers were obliged to sell most of their resources, including draught animals and equipment bought on credit, to meet their debts and their subsistence needs.

In 2014, lack of information about available water in the dam in the dry season damaged many farmers' interests. They were not informed by Bagrépôle about the critical state of the water resource, so they took on seasonal credit through their organisations, but were unable to get a decent harvest because of water shortages.

This is what happened in Anambé in the early 2000s. Poor harvests meant that debts to Senegal's CNCA were not repaid, with the result that it withdrew from involvement in financing of rice farming in the area. Without sources of credit, only a small number of producers who had other sources of income or savings, such as livestock holdings or remittances from migrants, were able to continue to farm their rice fields. Others attempted to limit the impact of reduced access to credit by reducing the area they cultivated or by downgrading the quality and quantity of inputs (using their own seed or applying lower doses of fertiliser). Many left rice farming altogether, with the result that the percentage of the total irrigable area under cultivation fell.

Without access to institutional credit, producers sometimes resorted to taking loans from private traders. This type of credit, at exploitative rates of interest, obliges the producer to sell the crop at a price fixed by the lender, eating into incomes and jeopardising capacity to finance the farming enterprise. At Bagré in Burkina Faso, where the CNCA suspended loans because of unpaid debts for seasonal credit and equipment, traders would supply a sack of fertiliser (at 22,000 FCFA) at the start of the season in return for two sacks of rice (at 2 X 15,000 FCFA = 30,000 FCFA) at the end of the season, which represents an interest rate of 36% over 6 months. Many producers reduced their use of fertiliser because of this level of costs.

Difficulties in access to seasonal credit therefore impact negatively on the area under cultivation, on yields, and on producer incomes.

Poor performance of irrigation schemes and failures of agricultural credit: a vicious cycle?

In agriculture, risk is generally linked to events which are climatic (such as droughts and floods), human (diseases), ecological (pest attacks), or economic (price fluctuations). However, irrigated rice cultivation is markedly more risky than traditional rain-fed farming (see Box 1).

The following kinds of risk can be identified:

- **Climatic:** Irrigation does not totally eliminate climatic risk, for example from floods caused by excessive rainfall which overwhelms drainage or makes plots unable to be ploughed by tractors or harvested by machine.
- **Economic:** Marketing problems often arise when the volumes produced are too high for local processing capacity or local demand. A rice farmer who is unable to market his production cannot repay his loans and will be disqualified from

obtaining credit the following season. Prices paid to producers are also often affected by national policies which favour cheap imports.

- **Technical:** Design or implementation problems can affect irrigation schemes, such as plots which are poorly levelled or drained, have infiltration rates that are too high or excessive slope, and these faults are often the cause of low output or inefficient production. In addition to these structural problems there are often risks associated with the introduction of new techniques (new seed varieties, replanting methods etc.) or with shortages of materials and equipment (such as pumps and tractors), which can severely affect yields. Risks linked to infrastructural failures increase as these structures age, especially when routine maintenance is not done correctly.
- **Organisational:** for irrigated rice farming schemes to work properly, there needs to be a collective form of organisation which ensures that the agricultural calendar is respected and that access to water and the supply of inputs and services operate smoothly. Shortages of inputs or unavailability of mechanical soil preparation, harvesting and post-harvest processing at critical periods can have serious effects on producer incomes. Transition from a state-administered to a private liberalised system has brought difficulties, with producer and private organisations struggling to provide effective services. Where dams are dual-purpose (supplying both irrigation and electricity generation), prioritising electricity production has often reduced the supply of water for off-season rice farming, with disastrous effects on producers.

In addition to structural problems linked to the technical and economic management of the irrigation schemes and the rice value chain, farmers also face the inherent technical and organisational challenges of irrigated rice farming. Risks to their incomes are numerous, and profits made in good years are insufficient to protect against them. This means that producers farming reduced areas, and whose livelihood depends entirely on rice production, are not in a position to take on and repay significant levels of credit.

Poor performance in the irrigated rice sector is thus at once a cause of credit repayment problems and a consequence of the difficulty of accessing credit.

Access to agricultural services and inputs: a question of organisation?

The withdrawal of the state has pushed the private sector and producer organisations into playing a bigger role in service provision.

Box 2. Farmer organisations becoming involved in access to credit and inputs

At Sélingué in Mali, many producers have obtained credit through microfinance organisations such as Kafo Jiginew. To qualify for credit farmers must be members of a producer cooperative, provide joint surety, and have a technical endorsement from the Sélingué Rural Development Office (*Office de développement rural de Sélingué – ODRS*) attesting to access to a plot in the irrigation scheme.

Since microfinance organisations have established their presence in the area, producers are abiding more closely by the agricultural calendar and the recommended technical procedures. As a result, there are fewer abandoned holdings and fewer cases of holdings being withdrawn by the ODRS for non-payment of water fees. Production has improved so fees are paid regularly and credit repayment rates have gone up (defaults now stand at less than 5%).

The Bagré Rice Producers' Union has negotiated with actors in the distribution chain for access to seasonal credit. Coris Bank is financing 200 million FCFA of seasonal credit through a private company, the *Compagnie industrielle de production agricole et marchande* (CIPAM) based in Bobo Dioulasso, which provides the Union with inputs. The Union in turn distributes them to its members, and receives rice in return which it provides to a processor for hulling. The processor sells the rice to the national food security stock management company (*Société nationale de gestion du stock de sécurité alimentaire – SONAGESS*), which pays the bank directly.

This innovative system enables the Union to provide services to its members without involving itself in managing funds directly. Rice production is used as collateral under the terms of an agreement between the Union and the processors.

Failure of state finance in the rural sector has stimulated the growth of microfinance institutions to encourage better performance in rice farming (see Box 2). Producer organisations are playing a vital role in this, by signing contracts with microfinance institutions and providing joint security for credit repayment.

These experiences offer ways out of the vicious cycle of lack of access to inputs and services and of producer vulnerability. However, a number of challenges still remain:

- Public bodies have not given enough support to agricultural cooperatives and farmers' organisations, despite inviting them to play a role, and sometimes even hinder their effective operation (see Box 3). Although many of them were created as a result of pressure by development ministries when the state withdrew from direct involvement, these organisations are struggling to define their mission and serve their members.
- Government policies do not take sufficient account of existing organisations in their intervention strategies. In Bagré, state-subsidised distribution of fertiliser sometimes subverts farmer organisations' programmes designed to meet the needs of their members.

Box 3. SODAGRI and Anambé producer organisations

With the withdrawal of the SODAGRI from its role in the economic management of the Anambé basin, local producers were encouraged to organise themselves into GIEs (Economic Interest Groups) to access land and credit; water unions (Unions hydrauliques) for irrigation management; and the Anambé Producers Federation (*Fédération des producteurs du bassin de l'Anambé* – FEPROBA) to be the interface with the SODAGRI and external agencies.

These organisations had common problems: lack of services for support and advice, capacity building, access to inputs and finance, and for land tenure and water management governance; a lack of transparency; stagnant leadership. An institutional audit concluded that while FEPROBA had carried out its advocacy and representation functions fairly well, there were serious shortcomings in technical and administrative management capacity, made worse by lack of technical staff and trained managers.

The SODAGRI also muddied the waters by encouraging the formation of village branches of cooperatives as alternatives to the Unions and the FEPROBA, thereby creating an atmosphere of mistrust among farmer organisations.

- Seasonal credit may be poorly adapted to producer needs. Repayment periods are often too short for rice to be properly marketed, and difficulties in rapid repayment of credit may compromise access to new loans for the following season.

CONCLUSIONS

Most rice farmers in irrigation schemes do not have sufficient financial resources of their own to exploit their holdings fully. Without a functioning system of seasonal credit, those who have access to rain-fed farmland tend to divert their labour resources towards these crops and to reduce the area of irrigated rice they cultivate. An alternative response is to reduce the level of inputs and so the costs of rice farming, by applying lower rates of fertilisers and using their own seeds.

The lack of an effective and accessible system of seasonal credit for poorer farmers, allowing them to manage risk, limits their potential to make use of the irrigated land. As the land was developed at great cost to governments, this impacts negatively on the overall return on investment. It also leads to increasing differentiation between producers, as those who can finance their farming operations take advantage of those who cannot, by taking over their holdings through unofficial rental arrangements.

Government policy cannot ignore the issue of access to seasonal credit and to inputs. This has a key impact on achieving the objective of national food security, which was used to justify costly investments in dams and irrigation infrastructures. However, in addressing this problem, governments need to take account of the current dynamics of private operators and farmer organisations.

At the same time the question of the appropriateness of the rice farming systems established around big dams has to be examined. At present these systems involve high production costs and low levels of return. There has not been enough research into alternatives to the technical packages prescribed by development agencies, although lower-cost-input models exist and could be tested in local conditions. Examples include: improvement of soil fertility using organic fertiliser, lime, and green manure; weed control through water management; better equipment for cultivation, for harvest and for post-harvest operations; and reducing irrigation costs.

Frédéric Bazin

Natural resources management programme lead at the *Institut de Recherches et d'Applications des Méthodes de développement (IRAM)*.

f.bazin@iram-fr.org

Notes

This policy brief is based on the data collected in research studies, on the dams at Bagré (Burkina Faso), Sélingué (Mali) and Niandouba/Confluent (Sénégal) and a synthesis report:

- Guèye, B. (2014) Specialisation or diversification? Divergent perspectives on rice farming in three large dam-irrigated areas in the Sahel. GWI (West Africa).
- Hathie, I., Diouf, L., Diouf, M., et Kama, M. (2013). Les enjeux pour les petits producteurs dans l'irrigation à grande échelle – cas du barrage de Niandouba et Confluent (Anambé), Sénégal. GWI (West Africa).
- Kergna, O.A., Cissé, I., et Meïté, F. (2013). Les enjeux pour les petits producteurs dans l'irrigation à grande échelle – cas du barrage de Sélingué au Mali. GWI (West Africa).
- Ouédraogo, O., Sedogo, S.A. (2014). Les enjeux pour les petits producteurs dans l'irrigation à grande échelle – cas du barrage de Bagré, Burkina Faso. GWI (West Africa)

1. François Doligez and Dominique Gentil : *Le crédit rural* in : Mémento de l'agronome, chapitre 223, MAE/Cirad/Gret/CTA, 2002.

GWl WEST AFRICA

The Global Water Initiative in West Africa is an action-research and advocacy project. We work with family farmers and governments to shape policies and practices that support livelihoods and food security in the context of large multi-purpose dams. The project is funded by the Howard G. Buffett Foundation and implemented by IIED and IUCN.

www.gwiwestafrica.org

IUCN

The International Union for Conservation of Nature helps the world find pragmatic solutions to our most pressing environment and development challenges. IUCN's work focuses on valuing and conserving nature, ensuring effective and equitable governance of its use, and deploying nature-based solutions to global challenges in climate, food and development.

www.iucn.org

IIED

The International Institute for Environment and Development promotes sustainable development, linking local priorities to global challenges. We support some of the world's most vulnerable people to strengthen their voice in decision making.

www.iied.org

For more information about the Global Water Initiative in West Africa, please contact: **Jamie Skinner**
jamie.skinner@iied.org