

Managing water infrastructure and equitable land compensation schemes in irrigation projects for social and environmental benefits

Results from the 'Managing Bagré for equity and the environment' project led by CIRAD

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PLAYING THE BAGRÉPOLY ROLE-PLAYING GAME WITH BAGRÉ IRRIGATION STAKEHOLDERS. SOURCE: FARID TRAORÉ

The Bagré dam, constructed in 1992, is the biggest multi-purpose water infrastructure in Burkina Faso. Situated on the White Volta river in the south-east of the country, it is crucial to food production and hydropower generation. The area where the dam is situated is seen as having high potential for agricultural development in particular through the use of large-scale irrigation.

Bagré dam is currently the focus of efforts by the World Bank to increase private investment, expand agricultural production and generate employment through the Bagre Growth Pole Project. This project aims to find the right balance between the development of the private sector and the settlement of small scale family farmers impacted by the irrigation development. Its focus is on simultaneously supplying energy and developing irrigation to kick start economic development in the central-east region of Burkina Faso. Bagrépôle, a semi private entity, has been set up to oversee irrigation development and management in the area.

In many parts of Africa, national governments and their development partners see irrigation as an important strategy for sustaining economic growth and reducing food insecurity.

KEY MESSAGES

- Establish mechanisms that ensure the principle of 'land for land' equity translates into real increases in income for affected households, when relocating communities for irrigation schemes
- Support the development of new systems of intergenerational land transfer that prioritize those who want to farm, and foster off-farm opportunities for youth not interested in agriculture.
- Strengthen and expand the use of participatory engagement tools and simulations with farming communities to ensure the voices of small holder farmers are taken into account in decision making
- Strengthen the organization of agricultural value chains to enable farmers to make the most of them and to develop more effective risk mitigation strategies
- Promote environmentally sustainable economic development and adopt measures to monitor changes in both linked ecosystems and the provision of ecosystem services

They promote the development of large, multipurpose water infrastructure. But experience shows that these infrastructure development schemes can result in a number of negative consequences. For example, population displacement, 'land grabbing', flooding of community land, biodiversity loss and changes in regional hydrological patterns that culminate in human-induced floods or droughts.

It is crucial that the benefits of this investment in agricultural development and expansion of areas under irrigation, primarily by the private sector in partnership with the government, benefits local communities and is achieved in environmentally sustainable ways. This requires making improvements in the management and governance structures and processes. In the context of Bagré, the risk is that if these local community benefits aren't achieved, and environmental impacts reduced, it could lead to conflicts between communities (i.e. private sector agricultural investors versus displaced local farmers).

But what is the best way to manage large water infrastructure, such as the Bagré dam, for more inclusive social and environmental benefits? And what options are available for tailoring irrigation investments so that these are productive

while minimizing any negative impacts, enhancing equity and promoting healthy ecosystems?

Methods and approach

Focusing on the areas downstream of the Bagré dam this action-research project set out to address these questions. Researchers aimed to actively use the research process to build the capacity of decision makers at the local to national levels in the Bagré Growth Pole project and in the Nakanbé Water Agency to effectively manage these resources and promote equity among their multiple users.

The project conducted in-depth field work using a participatory engagement approach called Companion Modelling, community surveys, and key informant interviews. The Companion Modelling approach is one among many methods to simulate and explore natural resource management issues with diverse stakeholders. The guiding principles of the approach are equity, transparency, adaptability and iteration. It is an interactive process that supports dialogue, shared learning and collective decision making, driven by end user's interests. Knowledge, perceptions, behaviors, and practices evolve through the process and can lead to collective action plans

and improved community mobilization to implement them. The project research team used this approach to observe, learn about and assess the diverse range of legitimate viewpoints raised by natural resource users about issues relating to the management of Bagré dam.

Using these methods the research team investigated the natural, social and economic resources mobilized by the different types of farmers to satisfy households needs. Men are often those who benefit the most from irrigation, while women and youth are excluded from participating in more lucrative irrigated agriculture, so the project team explored ways in which equity could be improved. Issues of land allocation, smallholder farmer's economic and food security, and the vulnerability of these farmers, resettled through the project, to potential agronomic, climatic or economic shocks were also examined.

Results and policy implications

The irrigation schemes under the supervision of Bagrépôle have the potential to simultaneously improve the livelihoods and reduce food insecurity among local communities while also offering opportunities for the private sector to benefit from irrigated agri-business. But this dual positive outcome will only be achieved if certain key aspects are addressed.

Establish mechanisms that ensure the principle of 'land for land' equity translates into real increases in income for affected households, when relocating communities for irrigation schemes

Bagrépôle were found to have made comprehensive efforts to identify and map households and individuals displaced or otherwise affected by extension of the irrigation system. Bagrépôle also put in place a compensation scheme that accounts for the diversity of access and uses of the affected households, despite this process posing a significant delay to the construction of the irrigation infrastructure.

SIMULATING THE SALE OF PRODUCTS HARVESTED FROM THE RAINY SEASON AND PAYMENT OF CREDIT TO TRADERS.
SOURCE: FARID TRAORÉ



The Bagr p le compensation scheme is founded on the principle of ‘land for land’, as well as offering financial compensation for other assets lost such as houses, wells and crops. According to the ‘land for land’ principle any individual who owns a plot of land (on a customary basis) that is currently located where the future irrigated system will be placed, and who has to give up this land, will receive a plot of land in the new irrigation scheme in exchange of a size which will allow them to maintain their standard of living. In general this translates in reality to a ration of 4:1, with a minimum allocation of 1 hectare per household. The ratio of 4:1 is used based on an evaluation that an irrigated plot is four times as productive as a rainfed plot. So a farmer owning 4 hectares pre-irrigation scheme would receive 1 hectare in the new irrigation scheme. This approach raises a number of concerns:

- 1) The ration of 4:1 is based on rather optimistic scenarios about productivity and the anticipated market prices of irrigated products (mostly rice). In order to ensure real increases in income for affected households, it is necessary to update farm economic data with more realistic production levels on the basis of observed practices in other irrigated schemes rather than on the basis of theoretical potential that would not be reach in the short or mid-term.
- 2) Economic analysis of current agricultural systems shows that rainfed production is central to keeping smallholders above the poverty line (even those who now have plots in the irrigated area), but in the current scenario, many newly displaced households will most likely no longer have access to purely rainfed land outside of the irrigation scheme.
- 3) The ratio has been devised to maintain rather than enhance the revenue of smallholders, but with land scarcity, they become less diversified in their livelihood sources and so more vulnerable. It appears that some key elements of the compensation scheme are partly driven by the need to ‘free up’ more rainfed land from smallholders. Development schemes are more sustainable if they

positively impact rural communities (rather than merely maintaining the status quo) as well as looking after the interests of the private sector.

Establishing mechanisms that ensure the principle of ‘land for land’ equity that translate into real increases in income for affected households includes assisting farmers to develop and employ risk mitigation strategies such as diversification of farming practices and enabling others to explore new off-farm job opportunities.

Support the development of new systems of intergenerational land transfer that prioritize those who want to farm, and foster off-farm opportunities for youth not interested in agriculture

This would help address a key challenge that stems from traditional practices in land transfer that rely on the principle of intergenerational solidarity. Until now those with traditional land claims were the ones whose access to land were prioritized. The head of a household was obliged to secure a minimum area of land for his descendants so that they could also generate livelihoods and secure food through agriculture. Population growth means that this is no longer a sustainable practice since parcels of land of ever decreasing size would have to continue to be divided among subsequent generations. General land scarcity, and the current land allocation mechanisms which are creating further land scarcity, are forming the development of a potential poverty trap for smallholder farmers, as rainfed land is converted to agribusiness use.

Strengthen and expand the use of participatory engagement tools and simulations with farming communities to ensure that the voices of small holder farmers are taken into account in decision making

Effective participatory tools and simulations help to foster an exchange of views among stakeholders and develop relations between actors who normally don’t interact with each other. These

exercises can assist diverse actors to practice adaptation strategies in a virtual ‘game’ environment.

A role-playing game, called Bagr poly, was collectively developed by researchers, Bagr p le staff and members of the Nakanb  Water Agency. It was specifically designed to address the equity and environmental dynamics of large water infrastructure, and is applicable to the Bagr  dam as it is to other agricultural water “hot-spots”. The game was developed using Companion Modelling principles and then used to engage representatives of households impacted by the irrigation resettlement processes. Participants commented that the game’s participatory exercises were more useful than the presentations or training sessions they were used to participating in because the game enables them to ‘learn by doing’. In a virtual context, that is nonetheless close to reality, they learn to adapt, express their views, listen to others and develop relations with actors they’re not used to interacting with. A limited number of participants can attend each game session. There is a need, therefore, to find ways to bring the lessons learned from this process to a wider audience. One way to achieve this would be to train facilitators who can continue to introduce, and run, the game and other participatory engagement tools and simulations, with more farming communities.

Strengthen the organization of agricultural value chains to enable farmers to make the most of them and to develop more effective risk mitigation strategies

Well organized and functioning agricultural value chains help to ensure that farmers are best placed to obtain the most profit from their farming activities, helping to guarantee that their products get to market quickly, efficiently and cost effectively. This is better for the farmers and the consumers. It is not enough to promote agricultural intensification and diversification if the processing and marketing infrastructure is not supported at the same time.

Promote environmentally sustainable economic development and adopt measures to monitor changes in both linked ecosystems and the provision of ecosystem services

Agricultural intensification can negatively impact the environment through the increased use of fertilizers, pesticides, and other inputs as well as through the unsustainable use of natural resources such as water and land. Monitoring and managing the use of these inputs and natural resources will enable organizations such as Bagrèpôle to achieve a number of positive outcomes. For example, to base their management decisions on recent, site specific evidence, take preventative and remedial actions where necessary and appropriate, and even explore the development of niche markets (such as

organic or eco-friendly products) perhaps for international markets.

It would also be beneficial to strengthen links between Bagrèpôle and other agencies in charge of managing natural resources that are linked to the Bagrè dam, such as the Nakanbé Water Agency, the Volta Basin Agency, or the Ghana

Water Resources Commission and the White Volta Basin Board. This will reduce the potential for misunderstandings or conflict over these resources and the impacts from activities involving them. It could also open up opportunities for collaboration and exchange of information on issues such as flood or pollution events.



COMMUNITY MEMBERS SIMULATE EQUITABLE MANAGEMENT OF FARMING ACTIVITIES IN THE IRRIGATED SCHEME DURING THE DRY SEASON. SOURCE: FARID TRAORÉ

Further information and references

About the project:

<http://ur-green.cirad.fr/projets/wle-bagre>

<https://sites.grenadine.co/sites/aislf/en/2016/items/1966>

http://www.pole-foncier.fr/agenda/seminaires-du-pole/item/les-politiques-d-acces-a-la-terre-dans-les-amenagements-hydro-agricoles-contemporains-acces-aux-ressources-et-differenciation-socio-economique.html?category_id=17

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<http://www.cgiar.org/who-weare/cgiar-fund/fund-donors-2>

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