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ON THE TRAILS OF CONFLICTS AROUND THE USE OF WATER RESOURCES OF THE DAM OF SALBISGO IN BURKINA FASO

*** Frédéric BATIONO and Nadège COMPAORE**

Human and Social Sciences Research Laboratory (LABOSHS), Department of Geography, Norbert ZONGO University, Koudougou, Burkina Faso.

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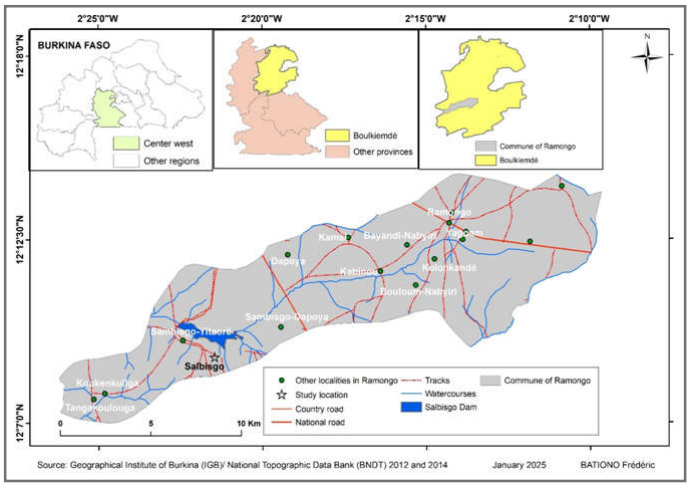
ABSTRACT

The growing needs of water and the multiplicity of its uses, increased pressure on hydraulic structures, leading to conflicts among users. The dam of Salbisgo in the province of Boulkiemdé in the Central-western of Burkina Faso is no exception to this trend. This article analyses the diversity of water use conflicts around this dam and their underlying manifestations. The methodology is based on secondary and primary data collected from the dam users and field observations. The result of the analyses revealed that, the most recurrent typology of conflicts is the one among market gardeners and Breeders, fishermen and market gardeners, landowners and non-native users. Moreover, fishermen face internal conflicts reflecting their highly contradictory modus operandi. Nevertheless, only a few isolated cases of conflicts occurred around the use of the dam. Conflicts between market gardeners and livestock farmers are sometimes violent, but in most of the reported cases, they subside immediately. The market gardeners, many of whom have unfenced plots, accuse the breeders of allowing their animals to roam freely, causing damage to a large part of their crops or seedlings, and in some cases to the entire planted area. Breeders justify letting their herds roam because of the lack of grazing during the dry season, when market gardening is in full swing. Users of the dam's water do not directly perceive the pressure that their various activities exert on the dam. Overall, it should be noted that these conflicts do not have the same intensity, because some are estimated as ''high'', ''medium'' or ''low''. All these conflicts have an impact on the governance of the dam as well as its sustainability.

Keywords: Conflicts of use, land pressure, water, dam, Salbisgo.

INTRODUCTION

The legitimacy of water uses has long been questioned (Garin & Richard-Ferroudji, 2008, p. 44) according to different logics linked to the conception of water and the systems of representation of the world among the populations that use the resource. Conflicts of use refer to competition between different activities for the use or occupation of an area or resource. Conflicts of use may be potential or real. Thus, before a conflict arises, there may be some manifest verbal or symbolic tensions, such as latent potential clashes among people of the community. Most often, they arise from users putting undue pressure on the water resource, which pressure stems from users' divergent or contradictory interests. Direct confrontations among users are generally caused by unclear definition of the management rules, legal, administrative or customary framework (Kibi *et al.,* 2003, p. 1). In Burkina Faso, particularly in the west of the country, water use is regulated by locally constituted management committees. They ensure that each category of user can carry out their activities under good conditions. However, these committees do not have a full control of water management because some elders in villages still have an influence in the decisions taken. Conflicts of use that prevail between categories of users are increasingly exacerbated and often lead to sharp tensions between those claiming for the primacy of their rights to use the resource over the other members of the community (Reverdy *et al.,* 2003, p. 51). As a result, indigenous populations give priority to their use of water resources to the detriment of non-indigenous users, who are excluded from permanent access to water. A common example is the case of transhumant nomadic pastoralists, who are denied access to water points for their animals on the pretext that they have no right to use the resource (Boelens, 2000, p. 52). Access to water is permitted to a certain category of user such as indigenous agricultural users. It should be recognised that the conflict itself is not necessarily an armed confrontation or a belligerent situation. The dam was built in 1961 and is located in the watershed of Salbisgobutin the dry season it dries up early. It has become a focal point for a number of uses. The dam was initially designed to meet the urban water supply needs of the town of Koudougou. However, the demographic growth, especially in rural areas, has increased pressure on water resources, leading to a massive rush of local populations to use the dam's water resources. This influx of people towards the dam has enabled the practice of activities such as market gardening, livestock farming, fruit growing, domestic use, etc. All these activities have an impact on the quality of the water. All these activities put pressure on the dam's water resources and compromise their sustainability.



This article presents a typology of the conflicts over water use around the dam, the reasons leading to their emergence and their consequences. It analyses these conflicts on the basis of isolated

***Corresponding Author: Frédéric BATIONO,**
Human and Social Sciences Research Laboratory (LABOSHS), Department of Geography, Norbert ZONGO University, Koudougou, Burkina Faso.

cases of conflict recounted by the players themselves. The main focus is the issue of access to land and the competition arising among the different actors in the search for production land.

METHODOLOGY

This study adopted a methodological approach including a theoretical reference framework, data collection, processing and analysis.

Theoretical framework

This study is based on the theory of proximity and common property management theories. First of all, proximity whether geographical or organised, facilitates the exchange of information and increases trust between actors (Torre, 2009, p. 9). Geographical proximity can facilitate the construction of an organised proximity. Moreover, it can lead to conflicts between neighbours (pollution) or over the use of space. This could put an end to cooperation between local actors. In addition, when stakeholders are organised around a common resource such as water, for example, this organised proximity has the advantage of allowing conflicts to be regulated by preventing or moderating them. Finally, the geographical proximity of water resources determines not only the sometimes tense relations between stakeholders, but also the reorganisation of water governance (Torou *et al.,* 2018, p. 6). Proximity provides a theoretical basis for this study, since conflicts can occur in the use of the water resources of the dam of Salbisgo because of the mental, cognitive and geographical proximity of the actors.

Focusing on the paradigm of individualized water management based on the market (Petit, 2004b; Ruf, 2004c), it is necessary to understand that water has become an economic good (Ciervo, 2009) of great value. This resource has become the exclusive property of a State or a community that seeks to regulate its use and optimize its availability. The acceleration of agricultural production combined with the generation of monetary income inherent in the practice of irrigated crops, despite improving local living conditions, has given rise to an individualism that has undermined social cohesion and old networks of solidarity (Sanou *et al.,* 2013). This is why water governance becomes the way by which public actors decide to impose clear constitutional and operational standards.

From Wittfogel[1] through Hardin[2] to Elinor Ostrom[3], hydraulic concepts differ. Wittfogel's principles (Vidal-Naquet, 1964) are based on the despotic and imposing nature of the old hydraulic companies. Hardin, for his part, questions the principle of community water management. This management will only be optimal when the resource is either privatized or considered a commercial good to be preserved. Hence the "tragedy of the commons" (Bon, 2001; Ballet, 2007) that he deplores, due to the fact that, when access to water resources becomes free and without any exploitation constraints, users abuse their access rights and thus jeopardize the sustainability of this resource, which also helps maintain the vital activities of the community of users who exploit it.

Due to the ineffectiveness of bureaucratic control and the abuse of monopolizing water resources, Elinor Ostrom proposes a third way (Ruf, 2011). To this end, in response to Hardin's theory on the tragedy of the commons, she wipes the slate clean of the concept that it is not possible to optimize the management of a common resource or to preserve it sustainably despite its common and multiple uses. It is for this reason that she admits that water can be better managed provided that common management rules are established for all categories of users. These management rules must first be the subject of a consensus between users and public water managers, or also between users and representatives of their communities, or even both. This evocation of the commons reminds users to respect the rules of the community; which help to cement relationships between users but also to reconcile uses to thus contribute to perpetuating the resource. When the prescribed rules are not respected by users, sanctions are provided for bad practitioners. This Ostromian conception of common goods has significantly contributed to fueling debates around hydraulics and has given weight to local communities in the administration or management of hydraulic resources and infrastructure. To this end, major international institutions have transferred the management of water resources to grassroots communities by empowering them and delegating to them certain tasks previously managed by the central government (Ivars and Venot, 2018). The drawback of this approach is that it is almost impossible to limit or permanently control unbalanced users of water resources. They are "free riders"[4] (Baron *et al.,* 2008; Le Crosnier, 2009; Petit and Romagny, 2009; Allain, 2012; Dardot and Laval, 2014) who undermine the sustainability of water resources and hydraulic infrastructure.

Data collection, analysis and processing

The article is essentially based on secondary and primary data and field observation. On the one hand, the secondary data were collected from the review of the literature on the issue. It permitted to discover results of similar studies about conflicts of use and/or competition for access to water on hydraulic schemes. On the other hand, the primary data were collected through qualitative and quantitative data from leaders of agricultural and market gardening cooperatives, local political authorities, the representative of the National Office of Water and Sanitation (NOWS) in Koudougou and the Regional Direction of Water and Sanitation of Center-West (RDWCW).The surveys took place in two villages bordering the dam, namely Salbisgo-Itaoré and Salbisgo-Dapoya. Random sampling allowed to survey two hundred and ten (210) dam users were per village due to the absence of a database showing the number of dam users. All in all, four hundred and twenty (420) users of the dam were surveyed.

An interview guide and a questionnaire served as data collection tools were. The field observation was used to have a look on the realities to supplement the data obtained from the interviews and surveys. All the data collected have been analysed using appropriate techniques. Qualitative data were first recorded and then transcribed manually. This data was then processed and analysed using the content analysis model. This type of analysis consists essentially in listing

[1]Karl August Wittfogel, born in Woltersdorf, Germany, on September 6, 1896 and died in New York, USA, on May 25, 1988, was a historian of China, who was a communist and then a conservative. He is the author of Oriental Despotism, a work that has sparked significant debate.

[2]Garrett James Hardin (April 21, 1915 – September 14, 2003) was an influential American ecologist, best known for his 1968 article, The Tragedy of the Commons.

[3]Elinor Ostrom is an American economist and political scientist. Her work focuses on the theory of collective action and the management of tangible and intangible commons and public goods. She was the first woman to receive the Nobel Prize in Economics in October 2009.

[4]A free rider is a user who benefits free of charge from a common resource shared with other users, leaving them to pay for the services associated with that resource. A free rider can also be defined as a person who, without paying the cost of a service, nevertheless benefits from it.

interesting passages (in the form of verbatims used throughout the writing process) and relevant passages with a view to identifying concepts, key words and ideas for analysis. To ensure anonymity, pseudonyms were used to identify respondents. Quantitative and spatial data were processed with Sphinx and ArcGis respectively. The results of the data processing and analysis were used to produce tables.

RESULTS AND DISCUSSION

Land pressure around the Salbisgo dam

Land, a precious commodity, is now the object of covetousness in rural areas. As a result of the accelerated depletion of the land used for rain-fed farming, farmers have rushed to the land bordering waterholes, particularly the land around the dam. But this land is not sufficient for all users, leading sometimes to unfair competition for its access. This has had a number of consequences, but the causes are much more indicative of the competitors state of mind about the issue of land.

The causes of land pressure around the dam

The lands around the dam of Salbisgo are anarchically occupied by water users, particularly market gardeners. This occupation is the result of a desire to produce in large quantities and maximise productivity gains. The agronomic potential of the land bordering the dam is much greater than that of land in areas with low humidity. This contributed significantly to the frantic race by market gardeners to find fertile land near the dam. The Communal Development Plan for the Commune of Ramongo rightly points out that there is a saturation of agricultural land in the commune and a decline in soil fertility. This is why people have taken refuge in the land near the dam, which is used for market gardening in the dry season, followed by cereal growing in the rainy season.

Most of the soil types found in the commune are suitable for market gardening. The most suitable one for this activity are located around bodies of water. Anon-exhaustive list of soils types generally found in the commune of Ramongo include hydromorphic soils, crude mineral soils, soils with little development, vertisols and paravertisols.

Firstly, poorly developed soils include several categories. They include poorly developed soils of climatic origin and poorly developed soils of non-climatic origin on gravelly materials; sub-arid soils, which are brown soils on clayey-sandy materials. It should be noted that these types of soils are poor in nutrients and unsuitable for rain-fed farming and agro-pastoralism. However, these soils are much more suitable for irrigated crops such as rice and market gardening. According to data from the National Land Use Database (BNDT) in 2012, these soils represent around 28.1% of the commune's soils, with a surface area of 4,719.1 ha. They are located near the dam of Salbisgo. Then there are the hydromorphic soils, which are generally located in minor beds, low-lying areas and flood-prone zones. Their distinctive feature is their suitability for market gardening, rainfed and irrigated rice, sorghum growing and agro forestry (SDAU-Koudougou, 2012). On the other hand, they are generally suitable for other rainfed crops but sometimes unsuitable for cotton, cowpea and maize. These soils make up 66.1% of the commune's soils, covering 11,090.2 ha. Most of the dam covers these soils.

The Vertisols and Paravertisols found in the commune are generally dark in colour due to their organic matter content, the abundant presence of swelling clay and a succession of collapsing surfaces. Vertisols and paravertisols are not at all suitable for agro-pastoral activities. They are moderately suitable for rain-fed crops, arboriculture and pastoralism. They are marginally suitable for rainfed crops, millet and cowpeas. They represent 1.8% of the commune's soils, covering a surface of 294.7 ha. The Vertisols and Paravertisols found in the commune are far from the dam site.

Finally, there are the rough mineral soils, characterised by their very sandy texture on the slopes and dunes. They do not have great agronomic potential and are only used to a limited extent for rice growing but suitable for pastoralism. They represent 4% of the soils in the commune of Ramongo, with a surface area of 666.9 ha. These soils border the dam of Salbisgo.

Of the soil types mentioned above, it is the less developed soils and hydromorphic soils that are most suitable for market gardening. These soils are reputed to be fertile, which could explain the pressure on land around the banks of the dam. The Vertisols and Paravertisols are practically uncultivated and have poor agronomic potential. The leaching of rain-fed soils is helping to amplify the rush of farmers to the land bordering the dam.

The absence of developed areas downstream of the dam could also justify these anarchic settlements and this remarkable pressure on land. This land pressure causes damage to the dam.

The consequences of land pressure around the dam

The pressure on land around the dam has consequences not only for the users themselves, but also for the sustainability of the hydraulic structure. Ploughing the land and digging gravity-fed irrigation canals fill the dam with mud, causing its rapid deterioration. Run-off water carries the mud towards the dam, reducing its depth and storage capacity. Anarchic settlements on the banks of the dam are the source of much wasted and polluted water resources, as well as uncontrolled withdrawals. Land pressure is therefore a catalyst for the many conflicts over water use around the dam.

Typology of conflicts over the use of water from the dam

Conflicts over the use of the Salbisgo dam's water resources include land conflicts, conflicts between farmers and stockbreeders, conflicts between fishermen and conflicts between users in the same category.

Land conflicts around the Salbisgo dam

Conflicts over land sometimes pit users against landowners and landowners themselves against each other in the allocation of land to applicants. This creates a kind of land business, especially between indigenous landowners and non-indigenous users.

Competition for access to land is fuelled by the interplay between indigenous landowners and non-indigenous users. This situation usually requires both parties to sign a time-limited contract for the use of the land. The reason why land is ceded to non-native users rather than to natives is that :

> "... You know, people are ungrateful, even some of them are no good. The people from Ouaga, it's their job, they know how to work. They are the ones who came here to teach our young people the technique; otherwise, they wouldn't know how to do it. He came to see your plot, you agreed that if he had finished working, he would give you something in return. And if it's your little brother, your nephew, your cousin, your son-in-law, if he's working, if he doesn't give you anything, you'll say, no, you can't ask him. Now, if next year you take the plot and give it to someone

> from Ouaga, that becomes a problem. You've left it and given it to someone else. You can't farm a plot, you eat into it, can't you give me something? I'd rather give to someone who's going to eat and then give me something too. That's the big problem. They [the local market gardeners] are very jealous of those in Ouagadougou" (Interview with Bijo, an authority in Salbisgo-Itaoré, November 2022).

Native users are considered to be 'bad payers', unlike non-native users who pay their fees at the end of each agricultural season. For this reason, landowners prefer renting their land to non-native users, to make sure they will be paid according to the terms of the contract between them. Furthermore, the non-natives commit themselves professionally in their activity, whereas the natives, for the most part, do it partially, without any real investment in terms of time, effort or financial resources. The agricultural yields of the former enable them to pay their land rental fees. As for the latter, even if some of them manage to harvest some income, they do not pay their rental fees. This forces the landowners to withdraw their plots of land and rent them out again to non-native users. The non-natives and the landowners are generally on good terms and renew their contracts every agricultural season. However, relations between the landowners themselves are strained when it comes to allocating land to allochthonous users.

Relations between landowners who are heirs to the same piece of land are sometimes strained when it comes to renting it out. This situation often creates conflicts that are quietly resolved because of certain social norms, such as the right of eldership. These internal conflicts between the landowners themselves 'undermine' the trust and credibility that non-native users have in them. As long as these disagreements do not terminate the lease contracts between them, the allochthonous users continue to deal with the landowners. The dispute arises during the division of the rental income between the landowner heirs. The older heirs sometimes use deception and brazenness to embarrass their younger heirs, who are also demanding what they are owed.

If nothing is done, this trend risks undermining the foundations of the social climate between native landowners. Now that land has become a high-value commodity, landowners are keen to rent it out or even sell it off, provided that at the end of each growing season they have a small amount of money in their pocket, which quickly runs out because it is so modest.

When we compare the monetary gains of the non-native users who rent the land from the village's native landowners with the land rental prices charged by the latter, it becomes clear that the non-natives are the biggest beneficiaries in terms of cost effectiveness. However, motivated by the desire to reap a quick passive income from this sell-off of land, the native landowners are the biggest losers in these land transactions. Overall, non-native users are the most involved in intensive market gardening and using much more sophisticated production techniques. However, local users gradually are moving into this activity on a massive scale, most of them with very limited or even rudimentary means of production. This makes them uncompetitive compared to non-natives. It should also be noted that land conflicts also arise between non-native and native users. These types of conflicts are a direct result of the double game played by native landowners who, unbeknownst to their co-landowners, will lease their land to a non-native user because of the latter's ability to pay them a large sum of money at the end of each cropping season.
Native and non-native agricultural users are sometimes at loggerheads over land. After the rainy season, the landowners hand over their land to the market gardeners. While the land is being cleared, misunderstandings arise that require some outside interventions to calm tensions. These are recurrent cases where the native and the non-native both defend their right of access to the land they are disputing.

In the event of a dispute, users are prepared to fight each other for the portion of land at stake. Although these land disputes are isolated cases, they nevertheless reveal the fierce competition for access to land between water users of the dam of Salbisgo. Some claim to be the real tenants, while others claim to own the land because of their geographical origin. Both non-natives and natives are subject to the double game played by landowners, who may lease land to more than one person. This leads to misunderstandings between native land tenants and non-natives, and between native land tenants and native landowners, and vice versa. In addition, conflicts frequently arise between herders and farmers.

Conflicts between market gardeners and livestock farmers

Of all the types of conflicts over the use of the Salbisgo dam's water resources, this is the most remarkable because of its recurrence and scale. In many respects, market gardeners and livestock breeders have latent misunderstandings that become vehement, mainly because of the legitimacy that each claims for its right to settle. According to Ragouné, a livestock farmer in Salbisgo-Dapoya, there are '... always conflicts and misunderstandings because when sheep enter someone's field or garden, it's to destroy. So they can't just let them go, because they rely on their activity to feed their family. As a result, there are always murmurs and quarrels. These conflicts arise mainly because of animals roaming around and also because of the lack of fencing on the plots:

> "If they tell you that your uncle is dead or your step-in-law, you go there. […] The animal is not a human ; it will not know whether to return here or not. If you come in March, April, there is no more grass; when they smell the tomatoes and others, they are forced to leave. So, that is the big problem. When the animals come into your garden and then you try to kill them, between the breeders and the market gardeners, it is not going well." (Interview with Bijo, an authority in Salbisgo-Itaoré, November 2022).

The temporary abandonment of cultivation plots by local agricultural users contributes to the intrusion of stray animals into these plots. This causes conflicts between market gardeners and livestock farmers. Livestock farmers justify letting their animals roam. In fact, at a given time of the year, in the dry season for example, there is considerably less grazing, which leads them to let their animals roam in order to find something to eat. However, this causes a few conflicts between them and the market gardeners:

> "Honestly, we've had problems with them all the time, what does that mean? We know that animals shouldn't roam. But we have no choice. Now, once the season's over, we leave the animals to go and drink and then come back; they too say they've come to spoil their gardening. We ask them from time to time, if it's like that, fence! For example, I'm here myself, my animals aren't too big, but for my old man at home, it's worth 60. We're going to fence them in and then feed them what? We have to let them go and drink and then come back. From time to time, there are fights. I myself managed to break up a fight that was going to be a bit fatal. Because they injured a gentleman's donkey, it became a problem. We tried to do what we could and it calmed down" (Interview with Gopacelo, a farmer in Salbisgo-Itaoré, November 2022).

The search for pasture for the animals does little to ease relations between market gardeners and livestock farmers. They become strained over time, mainly due to the divergence of interests. Some market gardeners do not fence off their plots, so livestock farmers allow their animals to roam freely. Insofar as there is no access ramp to the dam for watering the animals, the local people find the breeders' choice much more legitimate when it comes to letting their animals roam. Market gardeners are criticised for leaving their plots in the open. But some people think that '... farmers are wrong because they are not careful with their animals'. In case they lack the means to fence off their plots, users are obliged to always be present on their plots, even at night, as do non-native users who have even taken up residence on the banks of the dam.

In the village of Salbisgo-Dapoya, conflicts between livestock farmers and market gardeners are rare, but only one isolated case has been reported:

> "Here, there aren't enough difficulties between herders and farmers. We've only had this case once with a lady, but the people got along without there being any conflict between them. [...] They went to Ramongo with the story without informing me, but the people from Ramongo refused to deal with the problem because they came without informing the people from their village who could resolve the matter. Thanks to my intervention, the situation calmed down. That was the problem at that level, but there was an immediate agreement at Ramongo town hall." (Interview with Dripi, an authority in Salbisgo-Dapoya, November 2022).

The land dispute reported in Salbisgo-Dapoya did not last long, due to the diligence of the local political authorities in finding appropriate solutions. Nevertheless, in Salbisgo-Itaoré, these types of conflicts are recurrent:

> "Yes, there are conflicts between them. If one person's animals come to cause damage in the other's garden, the owner of the animals has to pay for what his animals have spoilt. And if he refuses, a conflict arises between the two (02). There is no shortage of conflict" (Interview with Topé, a traditional chief in Salbisgo-Itaoré, November 2022).

Compensating the victim is a peaceful way of resolving the conflict. But if this is not done quickly, the conflict may continue. Stray cattle also often cause misunderstandings with local people.

For a long time, herdsmen from neighbouring areas of Salbisgo came to the dam to water their herds. Unfortunately, when these animals came, they destroyed the crops and also drank large quantities of water from the dam. Knowing that the water resource was dwindling considerably, the village opinion leaders led a campaign against any animal intrusion without their consent. However, the herdsmen were taking their herds away without informing them. One traditional chief had to turn away a herdsman with an impressive number of herds of oxen. The reason for this was that the herdsmen came to take advantage of the free water from the dam without paying even a small contribution to the village authorities. Conflicts between farmers and herdsmen, although recurrent and widespread, are not the only ones concerning the use of water from the dam: fishermen also face internal and external conflicts with other categories of users.

The recurrence of conflicts of use in the fishing industry

Fishing is an activity practiced around the dam and constitutes a cause of this dynamic of conflicts of use. These conflicts arise not only among the fishermen, but also among them and the local population or market gardeners. Internal conflicts between fishermen are as follows:

> "Really, there are consequences. Too many consequences. We can't work without talking. I can't make it so that everyone always likes it. We put on the sound. I go out and buy the sound to put in the water. You go out and buy too. Maybe I'll earn more than you. Or maybe you asked me to go somewhere and you think I earn more" (Interview with Déjo, a fisherman in Salbisgo-Itaoré, November 2022).

The fishermen, driven by a logic of competition, infringe the rights of their counterparts by fishing as much as they want as long as they have enough catches, even if it is to the detriment of other fishermen. These few internal disagreements do not have much impact on the cohesion between the fishermen, although it is clear that this could become a cause for concern insofar as their activities are not coordinated in such a way that they have the same opinion and convergent interests.

Furthermore, relations between them and the market gardeners are not so peaceful:

> "[...] There's no agreement. What we want and what they want are different. Normally, when the canal builders have finished their work, they plug up the holes they've dug and leave. But they don't do that. They leave it like that: can we get along under these conditions? There are our animals, our oxen and sheep, if it falls over there, if you manage to see them early, you thank God. But if the animal rots over there, and you don't realise it, what can you do at the moment?" (Interview with Déjo, a fisherman in Salbisgo-Itaoré, November 2022).

The divergent interests of market gardeners and fishermen mean that it is sometimes difficult to reconcile the activities of these two categories. Insofar as the fishermen are obliged to enter the water to carry out their activity, the holes dug by the market gardeners prevent them from doing so. As far as conflicts between fishermen are concerned, it should be noted that these are recurrent and have caused quite a stir around the dam. Some relate to the use of certain unapproved fishing nets.

Although small-mesh nets are banned on the dam, they are still used by some fishermen. This is a source of conflicts among them and the local people in the village. These nets catch the fry and depopulate the dam of its fish. In addition, aquatic animals such as the caiman are totemic animals for the villagers. The local people do not capture them and allow them to continue living in the dam. Anyone who tries to capture them is quickly challenged by the local customary authorities, even by ordinary people. But these animals are often 'poached' at night when the local residents are asleep. This type of conflict between 'stowaway' fishermen and local residents shows how the dam's water resources are really the object of covetousness and recurring conflicts over how to exploit the hydraulic structure. Moreover, certain conflicts of use relating to fishing activities also concern the intrusion of fishermen from elsewhere.

The local authorities state that users come and settle on the banks of the dam without their consent. Only the landowners who sold them their land know about their presence. As far as the fishermen are concerned, since the dam is accessible to everyone, they come to fish without any authorisation. It is only when they are caught that they try to pay their fishing rights. But, on the whole, they have no idea about the dam and venture into areas that are sacred to the local

people, and this is detrimental to them. Conflicts over the use of water from the above-mentioned dam are not all of the same intensity. Water users perceive the scale of these conflicts around the dam differently.

The intensity of water use conflicts according to user categories

Conflicts over the use of the dam's water resources are perceived to varying degrees by the users themselves. Some users have little perception of their existence, while others see them as a hindrance to their activities (Table 1).

Table 1: Intensity of conflict

Categories of users	Agriculture	Brickworks	Livestock	Fishing
Low	27 (34%)	27 (34%)	20 (25%)	5 (7%)
Medium	132 (47 %)	41 (15%)	45 (16 %)	61 (22%)
High	23 (37 %)	11 (18 %)	14 (22%)	14 (22%)

Source: Field Surveys, December 2022.

34% of agricultural users, particularly market gardeners and brick-makers, claim to be in conflict with other categories of user; 25% are livestock farmers and 7% are fishermen. Farmers are the most affected by conflicts that undermine their relations with other categories of users. 47% of farmers have a moderate perception of the existence of conflicts with other user categories. Among brick makers, 15% think that there are moderate levels of conflict between themselves and other users. The same was true of livestock farmers (16%) and fishermen (22%).

37% of farmers said that they had conflicts with other categories of user that were considered to be of 'high' intensity. 18% of bricklayers also had intense conflicts with other users, whether bricklayers or not. The 22% and 23% of users who nevertheless have high intensity conflicts with other users are livestock farmers and fishermen respectively. In reality, conflicts of use are not on the same scale, given the complexity of the uses made. The most recurrent conflicts are between farmers, between farmers and livestock breeders, and so on. In terms of seriousness, conflicts between farmers and stockbreeders rank above the other types of conflict mentioned above.

Furthermore, users do not have the same perception of the existence or non-existence of a conflict with the other stakeholders in the dam, but also in the sharing of the dam's water resources.

7.14% of farmers stated that they had little conflict with other stakeholders in the area, 30.71% had medium conflict and 5.47% had high conflict. 6.42% of brick makers had little conflict with other stakeholders in the area, while 9.76% and 2.61% respectively had 'medium' and 'high' conflict with other stakeholders in the area. In the case of livestock farmers, 4.76% had high intensity conflicts with other stakeholders, while 10.71% and 3.33% had moderate and high intensity conflicts with other stakeholders. These conflicts reflect the tense relations that exist between stakeholders over water resources. When it comes to sharing the resource, the different categories of users are sometimes intransigent about how to exploit water resources in such a way as to enable users to benefit from them. Some monopolise it to the detriment of others, who are forced to leave the dam site to find other sources of water likely to cover their needs.

Discussion

Competition over the use of water of the dam of Salbisgo has given rise to several conflicts over the use of water resources. Most often conflicts arise between market gardeners and livestock farmers, and between fishermen. In the Office du Niger, conflicts of use arise sporadically and sometimes on a regular basis between shepherds and farmers as a result of the damage caused by animals to crops. Livestock also damage certain dyke networks. The multiple use of water through sometimes competing activities such as agriculture, livestock farming and fishing is a real brake on the sustainability of irrigated systems and the environment (F. Brondeau, 2009, p. 5).

On the small pastoral dams built in the north of Côte d'Ivoire (A. Coulibaly *et al.,* 2007, p. 201), the advent of other water uses has led to recurrent disputes between users. As a result, farmers and market gardeners have set up along the banks of the river to take advantage of the presence of the water to increase their production. However, when the cattle come to drink, they destroy the crops. This situation gives rise to numerous conflicts, which are managed according to two concepts. The first is the management rules promoted by SODEPRA (Society for the Development of Animal Production) and the customary management rules. The persistent duality between these two arenas for managing conflicts related to the use of water resources is a source of conflicts between categories of users. Taking into account the original purpose of the dams, market gardeners are accused by farmers and livestock breeders. In fact, the state recognises and legitimises the exploitation of dam resources by livestock farmers. As for market gardeners, their presence is not recognised by the state authorities. However, the primacy of local customary rights over the established state rules means that some non-native pastoral users are dismissed from localities where there are conflicts between farmers and herders. This situation reflects the power games crystallising the balance of power at local level, depending on the issues and interests of each stakeholder or user. The local people, the majority of whom are farmers, impose their rights to the detriment of the livestock farmers for whom the dams were initially intended. State bodies have set up management committees to regulate the use of small dams. However the management rules promoted by the committees are boycotted by the villagers, who systematically refuse to participate in dam maintenance. It should also be noted that fishing, livestock farming and irrigated agriculture, particularly market gardening, are the most popular activities around the Daringa dam in Benin. These different uses sometimes lead to numerous conflicts of use (F. Gangneron, 2011, p. 31). According to T. Ruf, (2015, p. 119), conflicts over access to water resources in Ecuador have long pitted irrigators against the administration in a context where access to water was regulated and rationed according to the uses and practices at work. These various disputes have often led to legal proceedings. The main reason for these frequent disputes is the diversion of water by certain irrigators to the detriment of other irrigators. These conflicts of use are very recurrent on water bodies with multiple uses. In addition, the pressure on land around the banks of the Salbisgo dam has led to competition for access to the dam's water resources, and in turn to conflicts of use, which, even if some of them do not manifest themselves vehemently, nevertheless help to 'erode' social capital, i.e. the set of common values shared by the members of a given community (J. Ballet, 2007, p. 4). Similarly, the current landscape around Lake Bagré has undergone major changes as a result of the development of irrigated plots and the submergence of certain villages, which have seen their populations evacuate the sites in order to resettle elsewhere (W. Daré *et al.,* 2019, p. 19). This undue pressure on land is likely to increase the vulnerability of current and future generations. France, particularly in the Because basin,

constantly faces problems of water shortages and conflicts over water use, especially during low-water periods in some of its watersheds (Montginoul *et al.,* 2000; Petit, 2009). Demand for fresh water is diverse due to the range of activities that require permanent availability of water resources. In fact, public involvement in water management (Clarimont, 2009) remains difficult. It can often happen that there is a lack of water to satisfy all productive uses, particularly agricultural uses where there is strong competition and urgent management of shortages.

CONCLUSION

The logics of the stakeholders exert pressure on the dam's water resources leading to several types of conflicts of use. These conflicts stem precisely from the pressure on land around the dam, due to the fertility of the soil and its suitability for market gardening. Access to the land and the ensuing anarchic occupation of the dam site inevitably lead to the deterioration of the hydraulic structure and its drying up as a result of these competing uses. All the activities around the dam survive thanks to the relative availability of the water resource. In case the resource depletes, activities are abandoned or displaced. This is a major blow to the various users who depend on the dam's water resources for their livelihood. The most recurrent conflicts of use around the structure can be summed up as those between market gardeners and livestock farmers, conflicts over land between the landowners themselves, and between natives and non-natives. In addition, fishermen face conflicts reflecting their modus operandi in the use of the dam. Conflicts between market gardeners and livestock breeders are sometimes violent, but immediately solved in most of the reported cases. Animals are sometimes slaughtered by market gardeners, and this sets things off. Early communication makes easy the mediation. Arrangements between native landowners and non-native users of the land led to leases, at the end of which sums of money were paid to the landowners for each cropping season. Conflicts arise in the sharing of the income from the lease between landowners and heirs. The fishermen were strongly opposed by the villagers, who demanded that they be removed from the site. This is a perfect illustration of the tragedy of common resources deplored by Garrett Hardin: when access to a common resource is free and unrestricted, users abuse their rights of access and may enter conflict to monopolise the resource. This compromises the sustainability of the resource.

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