



Inclusive institutions around natural resources characteristics and challenge: a case study in the central Niger delta of Mali

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ABSTRACT

In the central Niger Delta, access to natural resources is a major challenge for the working population, particularly women, youth and children. This constraint is reflected in the extensive occupation of the area by radical groups that dominate the territory. The objective of this study was therefore to examine the issues related to the management of these conflicts over natural resources in order to promote the socio-economic development of the communities in the Youwarou prefecture. Our sample size was made up of 71 community leaders, and the analysis were based on descriptive statistics. The analysis of these data is contrasted with the various socio-demographic determinants. The results showed that 69.4% of the leaders were already satisfied with institutional resolutions and were aware that conflicts over natural resources had diminished and were managed in a very constructive manner. In conclusion very, few community leaders 29.6% were not at all satisfied with the service provided by existing conflict management institutions and mechanisms.

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INTRODUCTION

The inland delta of the Niger River is one of the regions of Mali that is affected by large-scale land allocations (Brondeau, 2013). One million people live in this territory of about 35,000 km². Since 1990, at least 18 violent conflicts have been fueled by the exploitation of natural resources, from high-value resources such as timber, diamonds, gold, minerals, and oil, to scarce resources such as fertile land and water demonstrate by PNUE (2022). The area currently occupied by large-scale projects is one of the key transhumance zones between the bourgoutieres of delta in

central, which constitute a dry season pastoral zone, (Coulibaly and Sangaré, 2003; Ouattara et al., 2022).

After outlining some general contours on this group, led by Amadou Kouffa and a founding member of Jama'at Nasr al-Islam wal Muslimin (Group for the Support of Islam and Muslims-JNIM) a coalition of Salafi-jihadist insurgent groups operating in the Sahel region of sub-Saharan Africa, (Thompson, 2021). Katibat Macina is one of the most active jihadist armed groups in Mali today which Amadou Kouffa is the leader group. In the late 2000s he was an imam known in central Mali

for his preaching and piety. After having met Iyad Ag Ghali through the local name for the Tablighi Jama'at. Amadou Kouffa joined Ansar al-Din in 2012 and began reorganizing to wage a more concerted struggle in the central Mopti region. Originally mentioned in press reports of the Macina Liberation Front, which began to operate more publicly after 2015, it was in 2016 that Katibat Macina began to operate more seriously in the agriculturally rich Niger Delta. He built a significant part of its outreach efforts around the discontent of local "Peulh" populations, a lack of justice in the area, and social tensions (ECFR, 2019). In 2018, with the arrival of the Katibat Macina group in the flood zone, farms became inaccessible to women, youth and children (ECFR, 2019). In this context, conventions have been elaborated on resource management in recent years by NGOs in the Youwarou prefecture. An impact study conducted in 2019 by Welthungerhilfe on behalf of the project Conflict Management around Natural Resources in Youwarou and Surrounding Areas showed the risks of humanitarian insecurity associated with large scale food insecurity. In addition, the marketable volumes are not sufficient to meet the demand of the West African market. The difficulties of women, youth and children in accessing land is aggravated by the insecurity that has plagued the area since the arrival of the Katibat group.

The conflict over land and water is mainly related to the grazing area of the herds, which arrive too early, wage into the ponds, and break the fishing nets. Between customary law and modern law, that of the land or civil codes established the nation, it is very difficult for the judge to choose. This livestock constitutes a form of savings and ensures a certain social status. These pastoral agronomy systems had already undergone a spatial recomposing and adaptations following the land allocations managed by the inclusive institution (Coulibaly and Sangaré, 2003). However, the socio-demographic behavior of poor or distressed individuals and households is sustainable. Communities remain

directionless, institutions are out of control and administrative and customary leaders are not stable. An assessment has been made by several non-governmental organizations to help alleviate the suffering within the communities.

The way of life in the delta is primarily ecological, and the organization is voluntarily subjected to the vagaries of the river and security constraints. The difficulties of life for both groups give rise to more community conflict. Given the current expansion of political violence, the objective of this work was to study the problems of inclusive management of conflicts over natural resources in order to promote the socioeconomic development of the Youwarou community. Under the assumption that the mechanisms of prevention and management of conflicts allow for the restoration of peace.

In line with the new institutional economics, suggest that at least three types of transaction costs should be considered when evaluating procedural institutional arrangements, namely information costs, coordination costs, strategic costs and opportunity costs (Ostrom et al., 1993). It is only in a second step that the interactions between these ecological and social systems have been shown to increase the respective resilience (Adger, 2000).

According to the study Fida (2015) conducted in the Sahel, emphasis for has been on the resilience that comes from investing in improved natural resource management. If water resources are used more efficiently, groundwater will be able to replenish and act as a buffer during periods of drought. Barker et al. (2001) estimated that over-irrigation of land can result in losses of around 10%. According to Niang (2014), the weight of culture and religion is fundamental in structuring women's entrepreneurship, as Islam is the religion having the strongest majority in the Sahel. According to figures from the Ministry of Religious Affairs and Worship, Muslims represent about 95% of the population Mali (2021). Both the Koran (word of God) and the

Sunna practice of the Prophet Mohamed (peace and salvation) recommend that women obey their husbands and take care of household chores. It is only the interpretation that some people have made of the religion that relegates female entrepreneurship to the background. Indeed, the first wife of the prophet Mohamed (peace and salvation), was a merchant and therefore actively participated in covering the family expenses (El Abboubi et al., 2022).

However, it should be noted that today there is a great deal of confusion in the religious sphere (especially Muslim), which leads men to believe that women are inferior to them and that they should take care of household tasks and leave economic activities to men (Coulibaly and Sangaré, 2003). Socio-economic development in agriculture can help combat poverty (Sounon et al., 2019; Gallaher and Harvey, 2020). Fishermen, herders and farmers take turns exploiting the water and land to consume and exploit the resources of the Delta (De Noray, 2003). The state thus defined and the set of organizations and institutions responsible for administering the various social protection schemes for individuals against various risks which the national accounts refer to as Social Security Administrations (Rasselet, 2014). In 2009, Africa account for nearly one-third of the world's intra-state conflicts. In his work, Hugon (2009) showed the role of natural resources in African armed conflicts, and that over the past 60 years, at least 40% of intra-state conflicts have a link to natural resources and that this link doubles the risk of conflict recurrence in the first five years (PNUE, 2022).

The most comprehensive account of the decline of terrorist campaigns is provided by Cronin (2006), in her book 'How Terrorism Ends'. Her research was conducted in the twilight of the global war on terror, when many in academia questioned the feasibility of defeating al-Qaeda through military means. As for the opponent's marketing strategy, the individual resilience approach leads to an immediate focus on social sustainability, the livelihoods approach, or the capabilities

approach. As pointed out by Diagne (2013) and De Haan (2000) resilience is the degree of adaptation that manifests itself through the confrontation between risk factors and protective factors, that the processes of social inclusion and exclusion remain the focus of development studies, the interaction between actors and structures. The role of the family environment plays a major role in the act of entrepreneurship (Simen and Diouf, 2018; El Abboubi et al., 2022) on gender, culture and women's entrepreneurship in Morocco. The economic and ideological structure that has prevailed in recent decades makes it difficult to be optimistic about the future of peasant agriculture in this region in search of a process of agricultural development that has always been difficult to address (ECFR, 2019). So that the literature review reveals that all these associated authors qualify conflict management as an essential vector in the fight against poverty, job creator, innovator, creator and developer of new products and consequently new markets, contributor to socio-economic development.

MATERIALS AND METHODS

Sampling and data collection

We worked use a sample of 71 community leaders. These leaders were interviewed in order to better discern the issues at stake and to examine the prospects for ending the crisis. The data collected samples varied according to the communities. The collection period was from May 11 to 27, 2020 and was conducted by 4 interviewers under the supervision of a researcher. An individual questionnaire was administered to find out their opinions on the quality of services provided by the inter-community Table 1.

To ensure the reliability of the measurement scales, we used Cronbach's alpha Peterson (1995) coefficient. This is a coefficient that measures the internal consistency of a scale constructed from a set of items Peterson (1995). He also showed that the average alpha coefficients reported in the literature rank from 0.7 for values and beliefs

to 0.82 for job satisfaction. The main variables used in this study are: gender, age group, education level, main activity sector and institutional sector. Figure 1 below shows the distribution of respondents in the Youwarou prefecture.

Economic analysis of conflict

Economic theories assume that the economic rationality of agents is representative that privilege internal factors of states by contrasting rulers and rebels (Somé, 2013). Combatants can be treated as entrepreneurs of war, that is, as rational agents making cost/benefit calculations. This work uses game theory and international statistical series to conduct econometric tests (PNUE, 2022).

Unfortunately, informal agricultural coping mechanisms that allow households to survive shocks have proven to be completely inadequate because African farming communities use less capital-intensive technologies and have smaller scales of production (Collier et al., 2008). Today, microeconomic analyses apply to both terrorist actions and civil wars. Game theory on dominant strategy choices is particularly well suited to study the strategic behavior of interdependent actors in a situation of asymmetric and imperfect information and rivalry over scarce resources (water, air, land) of increasing diversity (Rasselet, 2014). The analysis of armed conflicts is made very difficult by the entanglement of explanatory factors and the specificity of different configurations. Comparative analysis by type of violence correlates variables such as poverty and access to resources, failure to scale up, education level or social spending with variables such as political, social or homicide violence. In addition to this socio-cultural aspect, it should be noted that religion and its interpretations have not been favorable to women in our different societies.

Today there is a trend that shows a massive entry of women into socio-professional and entrepreneurial life,

particularly through the creation of businesses (Niang, 2014). Conflict and peace have costs and benefits, the probability of conflict decreases when income increases (the impact of per capita income is monotonic and decreasing but income squared is not significant). These models have the merit of attempting to prioritize explanatory factors and to test certain hypotheses empirically. However, they reduce the complex reality to utilitarian or praxeological motivations (matching means to ends).

Framework for analysis

Descriptive statistics, means, standard deviations, and frequencies were used in this study. The main variables used being: gender, age of participants, education level, main activity sector and institutional sector. The selection of interviewees was done by targeting those who are truly involved in the process of conflict management, peace and reconciliation dialogue for the future. Conflict analysis would design strategies that respond sensitively to conflict in a particular country and provide some contribution to conflict reduction or resolution through social and economic development policies (Rasselet, 2014).

Conflict management is a key feature of Delta social life (Barrière and Barrière, 2002). Many family farms are in a very precarious situation. The lack of technical and commercial support and, above all, the small size of farms (Rasselet, 2014) are undoubtedly the main obstacles to the modernization of family farming: 56% of farmers have less than 3 ha, the threshold for economic viability with the average size of farms estimated at 3.7 ha (Florence, 2011). The situation today is characterized by a high proportion of small farms with low productive capacity (Coulibaly et al., 2006). The availability of irrigated land has become a major constraint, accentuating the differentiation between farmer and owner and generating a very active informal land market (Brondeau, 2013).

Table 1: Profile of respondents.

Respondents Profiles	Number of people take	Frequency (%)
Head or advisor of village	9	12
Municipal advisor	3	4.23
Breeders	1	1.41
Farmers operator	29	40.85
Leader associative	2	2.82
Resource person	4	5.63
President of younger	2	2.82
Fisherman	3	4.23
Women's representative	18	25.85
Total	71	100

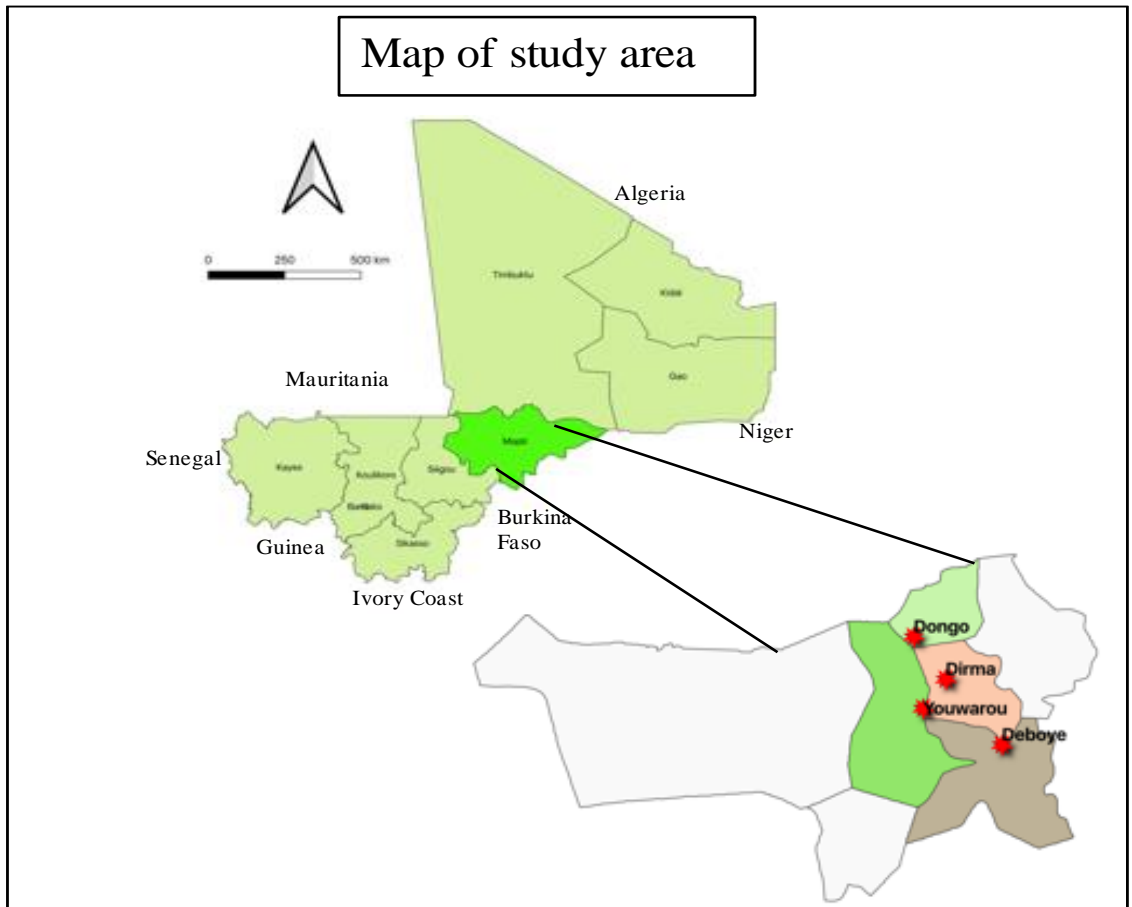


Figure 1: below shows the distribution of respondents in the Youwarou.

RESULTS

Socio-economics characteristics of respondents

The analysis of the data showed that the age of the people interviewed varied from a minimum of 21 years to a maximum of 71 years, with an average age of about 41 years. Of the interviewees interviewed in face-to-face interviews, 41% were in the commune of Youwarou, followed by 38% in Deboye and 13% in the commune of Dogo, and only the commune of Dirma did not present a high proportion around 8% of leaders interviewed by telephone.

The descriptive statistics of the socio-economic characteristics of the farmers are summarized in Table 2. The majority of the respondents were men's, about 75%, belonging to an organization, inter-community and were landowners while women represent 25%. Figure 2 showed the characteristic of education level desegregated, so that the average, more than half of the surveyed leaders 83.3% were formally educated, of which 28.17% have basic education and 12.68% had secondary education. About half of the respondents are in contact with agricultural extension agents and were engaged in non-farm activities. While farmers were highly represented with over 40%, women are represented in all activities at 25%. The Figure 3 below shows the variability of these sources.

Managing conflicts over natural resource management

The initial cause of conflict may be minor, but once it starts, violent conflicts can spiral out of control. Violence breeds poverty, exclusion, and lack of institutions, which in turn fuel conflict. Wars of poverty are largely explained by underdevelopment and exclusion. Natural resources are usually formulated without the active and sustainable participation of local communities and resource users. Among the causes of conflicts arising during the implementation of policies, programs and projects are a lack of harmony of mechanisms to the type of conflict, lack of coordination between existing legislation and legal

procedures, and inadequate or insufficient dissemination of information at the appropriate time. Figure 4 in below shows the diagram to depict the analysis conflict framework used by social group in Youwarou prefecture.

However, in 2019, the conflicts related to access to and exploitation of natural resources have decreased and are managed constructively thanks to the actions of humanitarian activities that have taken place in the circle of Youwarou, such as Welthungerhilfe, International Rescue Council (IRC), CARE International, (Group of Research and Technical Applications) GRAT, Association Development Global (ADG), which have put in place mechanisms for anticipating and managing conflicts, allowing individuals to organize themselves around problems related to natural resources in order to develop strategies for overcoming crises. In addition to this information, the community training offered by the project has provided the farmers with knowledge on the operation and management of the infrastructure. This capacity building has brought peace and strong social cohesion among farmers.

Table 3 explain conflict level appreciation by community. The doubt in the resolution of conflicts is quite enormous within the community for reasons that the presence of radicals does not facilitate access for all. Despite the efforts of the community and the support of humanitarian organizations in the area is 38% of those surveyed said that conflicts related to access to and exploitation of natural resources have decreased and are being managed constructively thanks to the project's actions around 62%. Concerning the appreciation of the socio-professional groups, which participated in the management of conflicts, 43.6% confirmed that access to natural resources is available to all communities, men, women and youth. On the other hand, 29.6% of respondents had a poor assessment of the handling of services provided by the institutions.

Yet, 45% of the people surveyed think that the restitution of the members of the institutions and leaders who were involved in

the process of conflict resolution and tension had contributed positively to changing the behavior of the community used that each one thinking in a constructive way and has greatly favored the warnings, prevention and management of conflicts around our natural resources, respect for the ecosystem, and safeguarding of the infrastructure. For very few people about 33% think that it facilitates a lot access to natural resource to work.

Community mechanisms for conflict management

Unfortunately, informal agricultural coping mechanisms that allow households to survive shocks are proving to be completely inadequate as African farm households use less capital-intensive technologies and smaller scales of production (Collier et al., 2008; Sounon et al., 2019). People listen carefully and dictate lessons in a very fair way, and the peaceful resolution of conflicts has reached 17%, and has contributed a lot to the reduction of tensions as around 39% of the people surveyed think so. Radicals must leave the areas, 69% of the respondents believe that there is an improvement in the way conflicts are managed in their communities (Ibrahim and Zapata, 2018).

Table 4 shows the description of conflict prevention and management at the

institutional and community levels. Customary strategies for managing natural resource conflicts have both strengths and weaknesses. These techniques have similarities despite the diversity of cultural contexts, with negotiation, mediation and arbitration being common practices, as well as some coercive measures such as peer pressure, gossip, ostracism, supernatural sanctions and violence. According to the survey data, the institutions responsible for conflict prevention and management are known by all the communities. However, conflict resolution mechanisms are not known by the communities. It should be noted that more than 81% of the respondents does not always know the mechanisms for conflict prevention and management within a community. Also, 26% were not at all satisfied with the service provided by the conflict management institutions and mechanisms that have been put in place, and in addition to this, they think that these institutions should be encouraged to improve the quality of their work while involving everyone in the management of conflicts. This management at the level of institutions and mechanisms was done in a pyramidal manner through dialogue and mediation to resolve conflicts while involving all the resource persons related to conflict management.

Table 2: Socio-demographic characteristics of respondents.

Variable	Obs	Mean	Std Err
Sex	71	1.3	0.4
Age	71	41.2	8.9
Education formal	71	0.83	1.1
Conflicts over access to natural resources have decreased and are managed constructively	71	0.8	0.4
Women access	71	0.7	0.5
Young access	71	1.0	0.2
Community access	71	0.9	0.2
Socio-professional groups are satisfied with the service provided by the institutions	71	0.6	0.5
Conflict management participants can confirm access to natural resources for all communities.	71	0.4	0.5

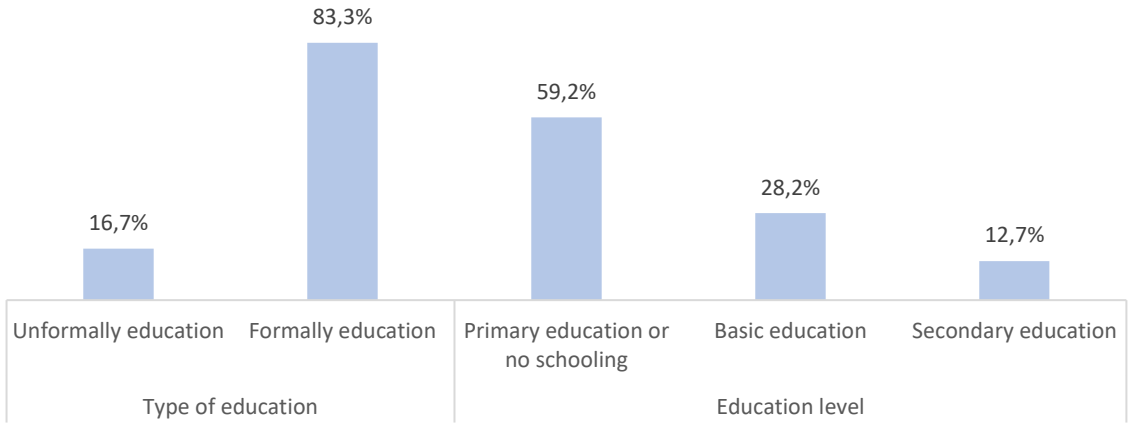


Figure 2: Characteristic of education level desegregated.

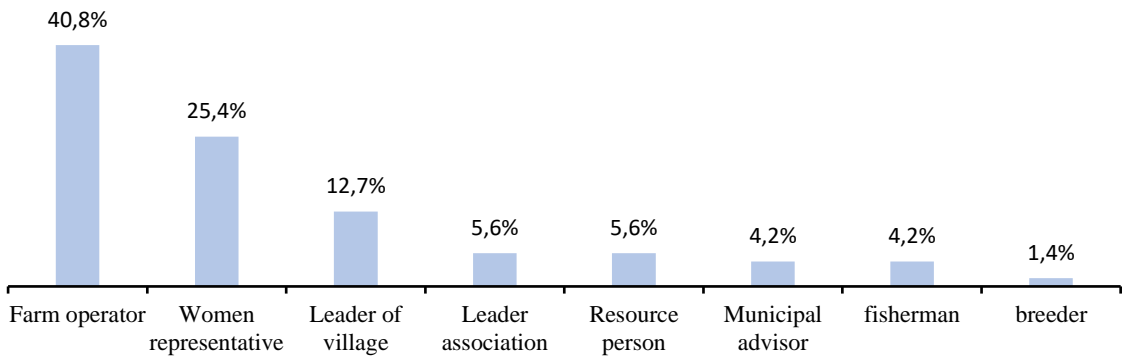


Figure 3: Profile of participant.

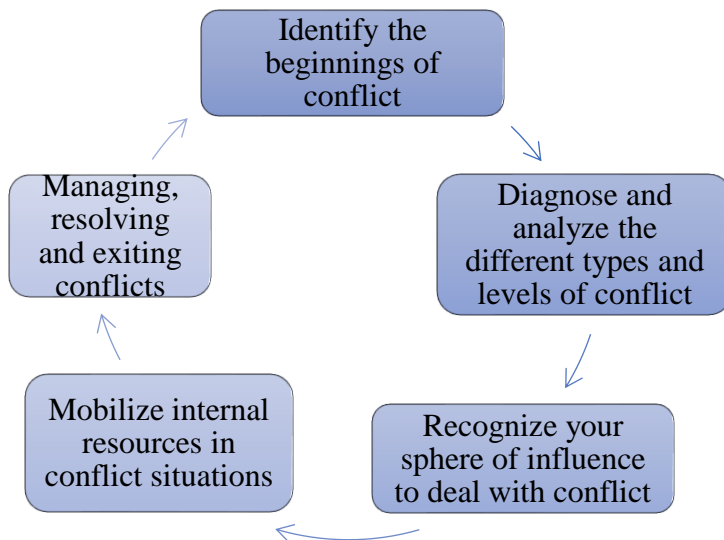


Figure 4: Diagram to depict the analysis conflict framework used by social group.

Table 3: Level of appreciation of conflict management by community leaders.

Appreciation	Appreciation	Size	Deboye	Dirma	Dongo	Youwarou	general
Women's level of access to conflicting natural resources	Mean access	27	18.3%	1.4%	2.8%	15.5%	38.0%
	Perfect access	33	16.9%	7.0%	8.5%	14.1%	46.5%
	No access	11	2.8%	0.0%	1.4%	11.3%	15.5%
	general	71	38.0%	8.5%	12.7%	40.8%	100.0%
The level of accessibility of youth to conflicting natural resources	Mean access	25	18,3%	1,4%	8,5%	7,0%	35,2%
	Perfect access	33	11,3%	7,0%	4,2%	23,9%	46,5%
	No access	13	8,5%	0,0%	0,0%	9,9%	18,3%
	general	71	38,0%	8,5%	12,7%	40,8%	100,0%
Socio-professional groups are satisfied with the service provided by the institutions	Mean access	21	15.5%	0.0%	4.2%	9.9%	29.6%
	Perfect access	19	9.9%	1.4%	4.2%	11.3%	26.8%
	No access	31	12.7%	7.0%	4.2%	19.7%	43.7%
	general	71	38.0%	8.5%	12.7%	40.8%	100.0%

Table 4: Description of conflict prevention and management at the institutional and community levels.

Description	Institutions responsible for conflict prevention and management	Community-based conflict prevention and management mechanisms
Village Council	+	+
Recotrade through griots	-	-
Peace Committee	-	+
Inter-collectivity	+	+
Cofo	+	+
Conflict management monitoring committee	-	+
Traditional chieftaincy customary management, land, water, and grazing	+	+

DISCUSSION

The present study was conducted in four communes of the central Niger delta and inaccessibility to several areas meant that collections were limited and completed very quickly. Despite the efforts of the community and the support of humanitarian organizations present in the area, 62% of respondents said that access to and exploitation of natural resources is still an issue and is not being managed constructively (Ouattara et al., 2022).

Thus, 56% of respondents said that the actions of socio-professional groups are not appreciated by the community with regard to the management of conflicts over natural resources. But these difficulties are related to gender discrimination (Simen et Diouf, 2013). On the other hand, 29.6% of the respondents have a poor appreciation of the assumption of responsibility for the services provided by the institutions. It should be noted that each 19% of the respondents are always know the mechanisms for conflict prevention and

management within a community. The natural resources of the land can, due to their scarcity (water, land), inflame tensions (Hugon, 2009). It has also been observed that conflicts involving natural resources are twice as likely to recur as local conflicts (Somé, 2013).

The members of the institutions, Cofu and community leaders all affirmed that they had received training sessions on conflict resolution and management around natural resources. The themes of these training sessions were based on mediation and leadership. The socio-economic risks are mainly related to the demographic pressure of the area which leads to increasingly problematic land issues. However, a good functioning of the monitoring system put in place will create a synergy of action with the communities of the central Niger delta. As said by Kperou Gado et al. (2020), determining the transhumance routes on the periphery of the natural reserve is historical, cultural, environmental, socioeconomic, and institutional.

The study highlighted uncertainties about the ability of farmers to lift themselves out of poverty, despite the fact that livestock production is an important source of cash income to raise the standard of living of rural populations. The socio-political and economic crisis that Mali has been going through since the humanitarian crisis of 2012 as explained Boeke (2021) is compounded by the health crisis that has disrupted most of Mali's territory. The relationship between conflict and natural resources has led to an ecological and environmental policy issue. To truly harness the economic potential of farmers, targeted investments are needed in the sector to leverage agricultural production for real economic growth and poverty alleviation.

Conclusion

We have conducted a study that contributes to the literature on conflict management in natural resource management by focusing on the prevention mechanisms of conflict management related to the use of agricultural resources and their socio-economic factors. We used primary data collected through a survey of community

leaders to capture the situation that interacts with conflict resolution from the innervations of the institutions. In the Niger Delta, the evolution of large-scale agricultural projects depends largely on situational factors that can change rapidly. Despite several attempts, this project faced a number of access limitations in several areas for data collection due to the poor security. According to reflections by community leaders in the prefecture of Youwarou, 44% of the community that is responsible for managing have adopted good conflict management behavior. The same trend was observed in the Upper Basins region (Burkina Faso) with a percentage of 56% (Coulibaly et al., 2022).

Very few community leaders 29.6% were not at all satisfied with the service provided by existing conflict management institutions and mechanisms, but 69.4% were already satisfied with the institutions' resolutions and were aware that conflicts over natural resources had been reduced and was being managed in a very constructive manner. The role of the state is very much in demand in this conflict resolution through its regaling activity of restoring order and maintaining regulation. It would be useful to highlight the limitations of this research in the central Niger Delta region of Mali ended, the main problem being operating in all the communes to collect data and insufficient security in the of community.

As a recommendation, a reflection should be carried out in order to integrate these insufficiencies as much as possible. Peace and cohesion in all-natural resources and integrates other dimensions that will address climate change issues (lighting equipment, energy and irrigation technology using panel pumps, etc....).

COMPETING INTERETS

The authors declares that they have no competing interests.

AUTHERS' CONTRIBUTIONS

YP and IO were responsible for data collection, analysis and interpretation of the data.

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