



**Conflict and cooperation in local water
governance – inventory of local water-related
events in Douentza District, Mali**

Moussa Djiré, Abdoulaye O. Cissé, Signe Marie
Cold-Ravnkilde, Amadou Keita and Anna Traoré

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**MOUSSA DJIRÉ and
AMADOU KEITA**

Lecturers at Faculty of Law and Politics of
Bamako University and
Senior Researchers of GERSDA
(Research Group on Sociologie and Law).

ABDOULAYE O. CISSÉ

Junior Researcher of GERSDA
Bamako University.

ANNA TRAORÉ

Lecturer at the Faculty of Economics and
Management of Bamako University.

SIGNE MARIE COLD-RAVNKILDE

Ph.D. Candidate,
Danish Institute for International Studies,
Denmark.

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Danish Institute for International Studies, DIIS
Strandgade 56, DK-1401 Copenhagen, Denmark
Ph: +45 32 69 87 87
Fax: +45 32 69 87 00
E-mail: diis@diis.dk
Web: www.diis.dk

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List of available papers

- Cossio, Vladimir, Rocío Bustamante and Thomas Skielboe: Cooperation and Conflict in Local Water Management. Conflict and cooperation in local water governance – inventory of local water-related events in Tiraque District, Bolivia. DIIS Working Paper 11/2010. Copenhagen: Danish Institute for International Studies.
- Rivas Hermann, Roberto, Tania Paz Mena, Ligia Gómez and Helle Munk Ravnborg: Cooperación y Conflicto en torno la Gestión Local del Agua en el municipio de Condega, Nicaragua. DIIS Working Paper 13/2010. Copenhagen: Danish Institute for International Studies.
- Thi Bich Yen Nguyen, Le Thi Thanh Phuong, Thomas Skielboe and Pham Thi Mai Huong: Conflict and cooperation in local water governance – inventory of local water-related events in Con Cuong District, Nghe An Province, Vietnam. DIIS Working Paper 14/2010. Copenhagen: Danish Institute for International Studies.
- Mweemba, Carol Emma, Imasiku Nyambe, Mikkel Funder and Barbara Van Koppen: Conflict and cooperation in local water governance – inventory of local water-related events in Namwala District, Zambia. DIIS Working Paper 15/2010. Copenhagen: Danish Institute for International Studies.

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ABSTRACT

Recent years have witnessed an increasing focus on water as a source of conflict. So far, much of the focus has been on the risk for transboundary water conflicts. Our current knowledge on local water conflicts is however more limited, and tends to be based on sporadic accounts of local water conflicts rather than on systematic empirical evidence. At the same time, the extent and nature of local water cooperation is often overlooked, just as we know little about the particular role of the poorest in water conflict and cooperation.

The lack of such knowledge jeopardizes current initiatives taken in many developing countries to ensure a more efficient and equitable water governance. To fill this gap, the Competing for Water research programme developed a conceptual and methodological framework for developing comprehensive inventories of local water-related conflict and cooperation. This report documents the results of applying this framework in Douentza district, Mopti Region, Mali, and discusses the implications.

Images from Douentza district, Mopti Region, Mali



I. INTRODUCTION

I.1 Background

“Water is the source of life!” This short phrase recited all over the world is not just a slogan. It underlines the importance of water resources for human existence. Water resources are essential for almost all human activities, particularly the rural ones. However, due to the climatic changes and economic activities, water resources are submitted to multiple threats. In recognition of this, recent years have seen an increasing focus on efforts to ensure efficient water management in developing countries, in particular reflected in water reforms taking place in many countries and in the linkage between access to safe drinking water and poverty reduction.

However, the lack of better insight into the issues limits the ability of Governments and donors to ensure that water policies are consistent with Poverty Reduction Strategy and with the overall objective of poverty reduction and equal access to resources for men and women, as well as for different ethnic and socio-professional groups.

Water and poverty are increasingly being linked in the public debate, not least due to the Millennium Development Goals and the explicit target to halve by 2015 the proportion of people without sustainable access to safe drinking water and improved sanitation. However, particularly in rural areas, the relationship between poverty and water reaches far beyond the lack of access to safe drinking water. Secure access to water for productive purposes, e.g. irrigation and water retention for crop production; watering of animals; ecosystem protection to ensure fish and grazing availability, as well as for environmental services (e.g. flood as well as drought control), is key to a significant part

of the rural poor if they are to move out of poverty (Bruns and Meinzen-Dick, 2005; Hodgson, 2004; Hope, 2006; World Bank, 2005).

According to the literature, competition for water increases between users and uses. The poor and otherwise disadvantaged groups tend to do less well than others in securing their access to water. In particular, entitlements to access water for productive purposes are often the first to be lost by the rural poor (Barker et al., 2000; Bruns and Meinzen-Dick, 2005). In this context, the current tendency to focus upon drinking water at the expense of the recognition of the wider importance of water to the rural poor (GWP, 2003) is unfortunate, among other reasons because it diminishes the likelihood that access to water, e.g. for productive uses for the rural poor, is catered for in the legal, administrative and institutional water reforms currently taking place in many developing countries.

Besides the fear that increased competition for water leads to poor people losing their access to water and thus further limits their options for moving out of poverty, there is a fear that increased competition for water leads to increasing conflict among users within as well as among different sectors.

However, there is little empirical basis to support conclusions on causal relationships between increased competition for water and the emergence of conflict and subsequently about their nature, intensity and impact.

Inspired by Wolf and his colleagues (2003), we identify several shortcomings associated with the current evidence of the relationship between water competition and conflict. The identification of these shortcomings informed the design of this research:

Prevalence of analysis of sporadic events: The widespread sense that the number and intensity of water-related conflict is increasing may just as well be a reflection of improved means of registering and communicating such as conflicts, rather than a reflection of the number and intensity of the conflicts themselves.

Neglect of cooperative events: Conflicts tend to be more spectacular and thus easier to identify than events of cooperation which seem normal, neutral. Moreover, as norms, rules, and interests tend to be more explicit during conflictive situations than during times of cooperation, focusing upon conflict often entails methodological advantages.

Lack of a temporal dimension: Conflicts do get resolved. Over time and often through efforts of mediation and negotiation, conflicts, disputes and tensions get resolved and agreements to share or cooperate with respect to given water resources are reached. Snapshots of sporadic events – most commonly conflicts – fail to capture such processes of conflict resolution.

Loose definitions: Terms such as conflict, dispute, tension and war tend to be used interchangeably and without clear definitions with respect to nature and intensity.

In order to contribute to a better understanding of these questions, a three years comparative research program called “Competing for Water” has been carried out since 2007 by Danish Institute for International Studies (DIIS) and partners from NORDECO, IIED, IWMI, DHI, Bolivia, Mali, Nicaragua, Vietnam and Zambia.

The research program includes three components:

- An inventory of conflicts and cooperative events and situations in the five countries (first year);
- A household survey and access to water (second year);
- In-depth case studies (third year).

These research activities are realized in five areas on three continents: Tiraque district in Bolivia; Douentza district in Mali; Condega district in Nicaragua; Con Cuong district, Nghe A province in Vietnam; and Namwala district in Zambia.

1.2 Objectives and expected results

The research program aims to contribute to sustainable local water governance in support of the rural poor and otherwise disadvantaged groups in developing countries by improving the knowledge among researchers and practitioners of the nature, extent and intensity of local water conflict and cooperation and their social, economic and political impacts, and how this may change with increased competition for water. Such empirically-based understanding has significant implications for the water policy, legal and administrative reforms currently taking place in many developing countries.

Based on comparative research conducted in five countries (Mali and Zambia in sub-Saharan Africa; Vietnam in south-east Asia; and Bolivia and Nicaragua in Latin America), the research program sought to provide the following main results:

- Quantitative inventories and qualitative case studies of the origin, nature, extent and intensity of local water conflicts and cooperation in five countries in Africa, Asia and Latin America, and of their social, economic and political impacts;

- Cross-cutting analysis and synthesis of findings from national studies, including typologies of water conflicts and cooperation and contributions to the theoretical understanding of the impact of economic and political inequality on the nature and outcomes of water-related conflict and cooperation;
- Recommendations for ongoing water policy, legal and administrative reforms developed and disseminated to national decision makers, practitioners, researchers and relevant Danida sector;
- Enhanced capacity and experience in the partner institutions within poverty-oriented analysis of water conflicts and cooperation.

1.3 Research questions

The research program seeks to answer the following questions:

- What are the extent, nature and intensity of local water-related conflict and cooperation in developing countries?
- Which factors – biophysical, socio-economic, political and institutional – are associated with different types of local water-related conflict and cooperation?
- What is the causal relationship between competition for water and the nature, extent and intensity of local water-related conflict and cooperation?
- To which extent do the poor and otherwise marginalized groups enjoy access to water for domestic as well as for productive purpose?
- To which extent are the poor parties to different types of local water-related conflict and cooperation?
- What are the social impacts of local water-related conflict and cooperation, particularly for the poor and otherwise marginalized groups?

- What is the impact of political and economic inequality upon the nature and social impacts of local water-related conflict and cooperation?
- How can national governments and donors address water governance issues in ways which help to resolve conflicts and foster cooperation while ensuring pro-poor and sustainable outcomes?

The present report presents the inventory results of water-related conflictive and cooperative events and situations in District of Douentza, Republic of Mali, and aims as exhaustively as possible on this basis, to answer to the question raised above.

1.4 Structure of the report

Following this introduction, the report is structured in the following way:

2. Methodology
3. Description of study area
4. Event distribution in space and time
5. Event character and nature
6. Event stakeholders and their actions
7. Event intensity
8. Third party involvement
9. Event outcomes
10. Situations and events
11. Conclusion

2. METHODOLOGY

2.1 Definitions

The following definitions and explanation are extracted from project methodology guides developed by the Competing for Water research program in October 2007, and contextualized to fit the context of Douentza district by the Malian research team.

Water situations

Water situations are essentially ‘cases’ in which different parties have competing interest in the same water source. Competitive situations are not necessarily conflictive. They may take the form of conflict or cooperation, or both at the same time. A water situation is composed of water events.

Conflictive and cooperative situations

Water situations are cooperative when parties manage to negotiate and/or sustain agreements for water use, or they may be conflictive when water access and use of one or more parties is contested. Competitive water situations can be characterized as ‘mainly cooperative’, ‘mainly conflictive’ or an equal mix of both.

Water events

An event is an action (or set of actions) that seeks to secure a party’s water access by either challenging the access of other parties, or collaborating with other parties to secure shared water access. The parties in events may include individuals, groups and organizations. Examples of parties are households, user groups, communities, companies, regulating agencies and authorities, etc. ‘Seeking access’ may include seeking direct access to water use (by e.g. farmers or pastoralists), or seeking to regulate and allocate that water resource (by e.g. state or traditional authorities).

An event is *conflictive* if one or more parties challenge other actors’ access to a particular water resource. This may range from a small obvious and public disagreement to violence and aggression. The ‘challenge’ may include the amount of water being withdrawn or the basic right to access water in the first place.

An event is *cooperative* if one or more parties engage in jointly coordinated actions with other actors to secure shared water access. This may range from verbal acknowledge-

ment of the rights of others, through joint water management mechanisms. The ‘sharing’ does not necessarily mean joint ownership – it can also include allocation of individual/private water.

To qualify as cooperative, events must have an *active* element: While general co-existence does involve some forms of passive recognition of the other, within the inventory we can consider actual cooperation to require some form of active behaviour vis-à-vis the other. During the in-depth studies, we may then explore the deeper meaning of established norms and frames of reference.

Reported and unreported water events

Water-related conflictive or cooperative events can be reported or unreported. In our study, *reported* events are events which have been identified through institutional sources outside the location of the event, such as local or national authorities, the media, NGOs etc., while *unreported* events are events which have been identified only through local sources, such as citizens or local institutions at the location of the event. If information sources of events are from both institutions outside the location of the events and at the location of the events, the events will be characterized as ‘both reported and unreported water events’.

Public and private water events

Based on *social* scales of water events, public and private water events are distinguished in the Competing for Water project. Water events are considered as public type when they either (i) involve two or more parties of which at least one party represents a social group of individuals from more than five households, or (ii) involve at least three different types of parties, e.g. fishers, companies or institutional actors. In contrast, private water events take place at a smaller scale, e.g.

Table 1. Local-level water-related event intensity scale

<i>Description</i>	<i>Intensity</i>	<i>Example</i>
Engage in organized collective violence/warfare	-7	Communities are in de facto war over a water body
Engage in unplanned collective violence, riots	-6	A fight develops between angry parties during a public meeting
Undertake collective large-scale violation of other party's access rights	-5	A party continuously and extensively overrides the water use rights of another party
Stage public protests/demonstrations (peaceful)	-4	A party organizes a public rally to protest against upstream water users
Denounce to authorities and/or third party (formal or customary)	-3	A party complains formally to the Headman. A party files a court case.
Engage in sporadic/small-scale violation or sabotage of others' access rights	-2	A party brings their cattle to a waterhole during a drought although they have no access rights
Engage in informal verbal dispute/expression of discontent	-1	During a project planning meeting one party complains that other parties are using too much water
Express casual verbal recognition of each other's access rights	1	Parties express part or full recognition of each other's rights during public meetings
Engage in sporadic/occasional joint activities	2	Parties work together to build a weir for irrigation
Commit to written or verbal agreements and plans that are not sanctioned by a third party	3	Parties make an agreement on water sharing but without third party witnesses
Commit to written or verbal agreements and plans that are sanctioned by a third party	4	Parties make an agreement on water sharing in the presence of a local headman or arbitrator
Establish joint organizational forum	5	Parties establish a Water Users Association for debating water use and/or lobbying for joint interests
Joint decision-making authority and/or rules development for water use and allocation	6	Parties establish joint elections for a water allocating body, or develop joint rules for water resource use
Emerge formerly individual access rights	7	Parties with previously separate cattle watering points decide to allow each other mutual access rights

between a couple of neighbours or between husband and wife. In the scope of our study, only public water events are recorded in the water event inventory.

Event intensity

Graduation of event intensity permits to assess water event intensity at local level. Event intensity scales developed by the Competing for Water program are presented in the following table according to which the intensities can be categorized into 14 degrees ranging from mild to strong conflict ('-1' to '-7') or cooperation ('+1' to '+7').

2.2 Sampling strategy

2.2.1 Site selection

District of Douentza was selected as one among five research locations based on a maximum variation sampling strategy. Based on the sampling criteria listed in Box 1, Douentza district complements the four districts selected in the other countries due to the presence of a multitude of water uses, notably livestock keeping, fishery, irrigation

and domestic water consumption, and due to its low precipitation.

The Douentza district covers an area of 8,200 km² and 148,849 inhabitants. The district is inhabited by various ethnic and socio-professional groups. Furthermore, several competitive uses and rules of use of water coexist.

2.2.2 Community selection

Ten communities (villages) were selected to identify water-related events and situations. The community selection was done according to the sampling instructions elaborated by the Competing for Water program.

As the Douentza district is subdivided into 15 communes consisting of 258 villages, we decided to realize the selection of villages based on the administrative subdivision of the district since this choice also ensures a geographical distribution of the various agro-climatic zones. The sampling basically involved three main steps.

At first, we made a list of all the communities (villages) within the 15 communes situated in the Douentza district. Then, the communes were 'weighted', so that a commune with 15,000 inhabitants is weighted differently from one with 3,000. To ensure that all the communes are part of the sample and to avoid exclusion of the smaller communes, small communes have been grouped. Table 2 below shows community sample descriptions and results. From the weighted list of communes, we proceeded to select 10 communities in a lottery form - assigning each community a number. However, due to seasonal migration, not all villages are inhabited permanently. For this reason, it was decided to supplement the community sample with an additional five communities selected from the communes with seasonally un-inhabited communities.

Box 1. Research location sampling criteria

- Continent
- Population density
- Precipitation
- Importance of formal water use allocations
- Importance of irrigation
- Importance of livestock keeping
- Importance of fishery
- Presence of industrial water use (including hydro-power)

Table 2. Community sample description and results in Douentza district

Shaded areas in the table indicate the communes which due to having a low population have been grouped in order to select one village from this group

<i>Communes (sampling stratum)</i>	<i>Ideal number of communities to be selected</i>	<i>Selected community</i>	<i>Inhabitants in selected community</i>	<i>Ethnic/Main profession</i>
Dallah	0.6	Boumban	361	Dogon/ farmer
Débéré	0.5			
Pétaka	0.5			
Dangol-Boré	1.8	Falembougou	612	Bambara/ farmer
Tédié	0.8	Guedoundé	804	Dogon/farmer
Kourarou	0.2			
Dianwely	0.6			
Diaptodji	2.6	N'Gouma	320	Peulh/Bambara/ Tamasheck, cattle-breeder/farmer
		Kel-Tagassit		
		Dendia	609	
		Sobo	582	
Gandamia	0.3			
Koubewel-Koundia	1.1	Dioni	230	Dogon/cattle-breeder, farmer
Haïré	1.7	Ouro-Fassy	193	Peulh/cattle-breeder
		Boni	4493	
Mondoro	2.1	Niangassadiou	2952	Dogon, Peulh, /farmer, cattle-breeder
		Ortongo	851	
		Modoro Dogon	2461	
Hombori	1.1	Hombori	3562	Sonrhaï, Peulh, /farmer, cattle-breeder
Douentza	1.4	Drimbé	975	Peulh/cattle-breeder/ farmer

2.2.3 Informant selection

In order to collect all water events and situations we identified three categories of informants: key informants, ordinary inhabitants and the so-called ‘resource persons’.

Key informants are persons who besides being inhabitants of the community are persons who take up formal positions in community-level institutions.

Inhabitants are persons who live in the community but do not take up any formal positions in community-level institutions.

A ‘resource person’ is a citizen who can be an official figure or not, live inside or outside the community but who, thanks to his position in the society, his experience and culture detains useful information for the research.

In the case of Mali, key informants include customary authorities, rural water supply authorities, administrative authorities, cooperatives of farmers, cattle-breeders and fishers authorities, women and youngster groups, etc.

Inhabitants were selected in function of their social and economic activities and their participation in conflictive and cooperative water events. Inhabitants include fishers, farmers, cattle-breeders, restaurant owners, well sinkers, water sellers.

‘Resource persons’ are teachers in the community, retired civil servants who served e.g. in Douentza, NGO’s or an association, civil servants in water-relevant offices at national, district and local level.

While all key informants and identified ‘resource persons’ were interviewed; only a sample of ordinary inhabitants selected was interviewed. The selection of ordinary inhabitants was undertaken through maximum variation sampling based on the criteria presented in Box 2.

Box 2. Informant selection criteria

- geographical location
- age
- sex
- resident water users as well as absentee water users
- well-being (e.g. using housing/roof quality as an immediately observable indicator)
- Pastoralists, fishers, farmers as well as other types of users (crop processing, brewing, etc.)

2.3 Brief overview of event and situation formats

The Competing for Water program elaborated an inventory format for registering all information related to water events and situations. The format was the same in all five research locations in order to allow cross-country comparison. The format contains various data like the location of the place where event took place, water uses types, sources and infrastructures, the main issues which events and situations are about, stakeholders and their actions, third parties involved in the event, character of events, outcomes, duration. The format also contains data about informants, events period and duration. The format was translated into French for interviewers and on this basis; an adapted interview guide was elaborated.

2.4 Source of data and water-related events and situations identification

2.4.1 Reported events

In order to obtain an overview of reported events in Douentza district, we conducted interviews/meetings with representatives of

relevant authorities from communal to national level. In each interview, the respondents were asked to list all main water sources and water uses in the district and brainstorm water events which have occurred since 1995 in each water source. After this brainstorming, they had to indicate if the event was reported or not and if possible indicate where to obtain the report. In the same way, to the extent possible, the existence of reported events was clarified, with others types of informants, e.g. key informants and 'resource persons'.

In particular, archives of relevant state administration offices, district and regional justice courts constituted important sources for the reported event. It must be underlined that newspapers and research reports on Douentza were the first (chronologically) used sources of information. However, no cooperative or conflictive events could be identified from this initial review.

2.4.2 Unreported events

Unreported events were identified through interviews with community members and other actors at the location of the events. In each of the selected villages and hamlets a list of existing water sources (rivers, ponds, lakes, wells, canals, etc.) was first elaborated by the community leader and his councils. Afterwards, the list served as the starting point for a brainstorming with informants about water-related situations which took place during the last ten years. Finally, the informants were asked to disaggregate the situation into events, through the chronological succession of actions taken place.

2.5 Ratio of reported and unreported events

During the inventory work, 195 events were identified of which only 46 (24%) were re-

ported, 102 (52%) unreported and 47 (24%) were both reported and unreported. Among the 46 reported events 33 (72%) events are conflictive and only 13 (28%) events are cooperative. From this figure it follows that in general water-related events are not often reported and that the events that are reported are most often conflictive. The reason why conflictive events are more frequently reported than cooperative events can be explained by the fact that in general, conflictive events are more visible and people tend to call the authorities to mediate for example in the case of a dispute between two or more communities. Most of the time, cooperative events are regarded more as an ordinary praxis which does not require intermediation from a third party and are thus not reported outside the community. For this reason, among the 102 events not reported, there are 75 (74%) cooperative events against only 27 (26%) conflictive events.

Figure 1. Reported and unreported events by character

Number of events

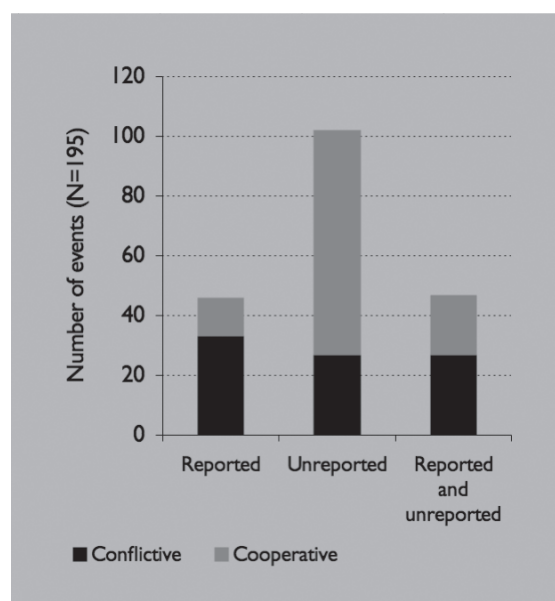
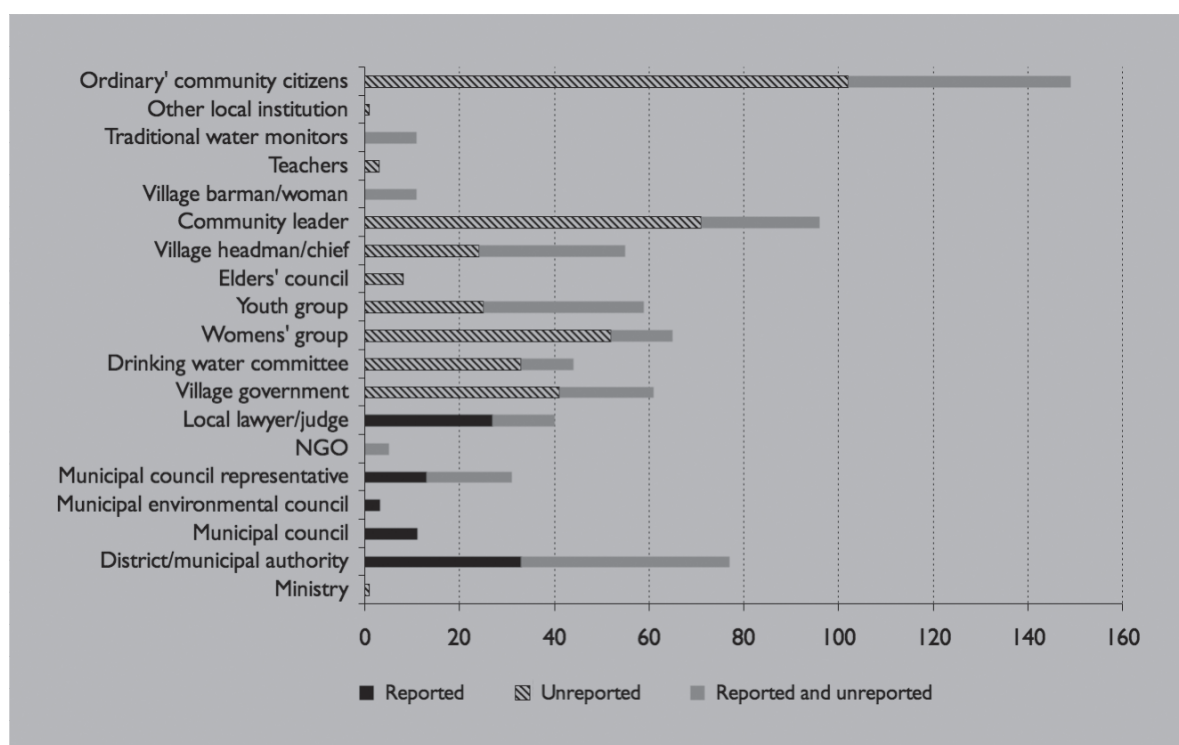


Figure 2. Identification source of water events*Number of events*

Events were identified from both communities and institutional actors from inside and outside the location of events. As it appears from figure 2, institutional actors were the principal information source of recorded events *outside* the communities. All the 27 recorded events were mentioned by judges and justice clerks, 33 events were mentioned by district/municipal authorities, 24 by municipal councils and their representatives.

For the unreported events mentioned by actors inside the communities, the main informants are ordinary citizens (102), community leaders (71), women groups (52), and village government (41).

There are several events (both reported and unreported) which are recorded inside and outside the communities. The both reported and unreported events have mainly been mentioned by ordinary citizens (47), dis-

trict/municipal authorities (44), youth groups (34), village headmen (31), and community leaders (25).

It also appears from figure 2 that when 'ordinary' citizens from communities are informed about some reported events (47), they often do not refer to the events as reported, as they are not always able to identify the external institutional authorities.

2.6 Possible data biases and limitations

This work may be affected by four kinds of possible data biases and limitations:

1. The first group of biases is of methodological kind. To begin with, the choice to limit the sampling to only 10 communities

has the advantage that it enables a thorough collection of events in one community. However, the 10 villages might seem to be a too small sample of the total 258 villages in the Douentza district. There is a risk that the number of events collected in the 10 villages selected does not draw a representative picture of the total number of unreported events in the Douentza district. For example, it might happen that some (about five) out of the 10 villages did not experience an important number of events during the last 10 years. However, this bias was minimized by taking in the account, all reported water events and situations which could be identified outside the sample communities, but inside the research location. Thus the inventory includes reported events from 22 communities.

2. The second type of methodological bias consists in the difficulty to identify and characterize the issue and the source of reference in practically all the water-related events. For instance, if a water event concerns the physical violation of a civil servant (as a result of a water conflict) who then complains to the justice court, the reason why he goes to court is not because of water but because of the physical violation he has suffered. In this case it is hard to indicate both the issue and the reference of the event as related to water. The civil servant might refer to state law which is not related to water as such. In this case it seems more adequate to characterize the issue of the situation than of the event. It is not easy to characterize some events of a water situation with elaborated variables. And, as we will show later, in many cases, a water-related event is tightly related to land issues. These land-related issues are not easily accommodated in the event

and situation formats and associated data base.

3. The third type of bias is related to the fact that in Douentza, community members rarely like to talk about their internal conflicts, particularly when the conflict has already been resolved. So, if there is no information outside the community (particularly documented) about a conflictive event which can be further confirmed and detailed by the inhabitants of the communities, it is not evident that they will be likely to talk about the event. Consequently, there is a possibility that the inventory work missed some conflictive situations and events. The in-depth case studies might be able to overcome this limitation.
4. Even so, in research like this, there is always a risk of 'missing the obvious'. If cooperation is what normally characterizes social relations, cooperative events may be underrepresented.
5. The fifth type of limitations is related to the lack of precision of certain data. It was difficult for the informants to provide precision about some details, such like dates of event, number of involved persons, succession of actions etc.

3. BRIEF PRESENTATION OF RESEARCH LOCATION

3.1 General presentation

Douentza is one of the 49 districts of the Republic of Mali and one of the eight which constitute the region of Mopti. The Douentza district covers 18,903 km², and is the largest district in the Mopti region. It is subdivided into 15 municipalities of which 14 are rural and one is urban. It has about 258 villages and pastoral groupings. The 148,969 inhabitants (census 2001) consist of six different eth-

Map I. Map of Mali



nic groups: Peulh, Dogon, Bambara, Sonrhaï, Touareg and Marka. The economic activities in Douentza are primarily farming, livestock rearing, forestry, fishery and crafts. There is no industry in Douentza.

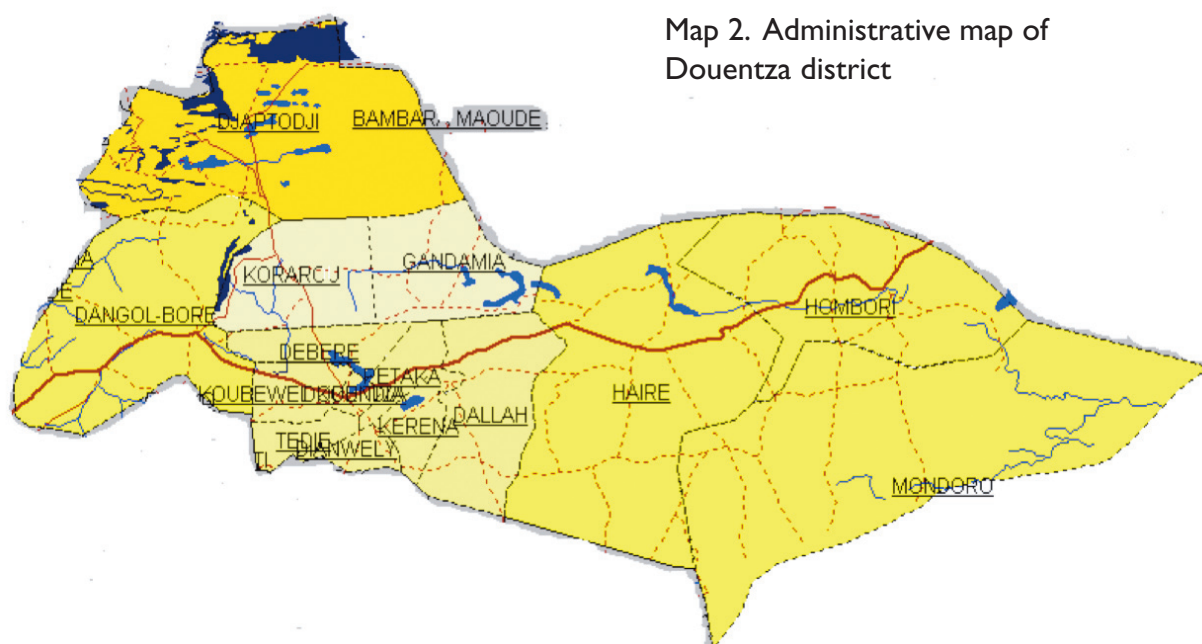
3.2 Climate and relief

As in the rest of Mali, the determining factor for the availability of water and other natural resources is the rainfall. The Douentza district has a typical Sahelian-Saharan climate, with a single rainy season from June to October, a dry fresh season of four months (November to February) and a dry hot season from March to May. The average annual rainfall varies from 400 to 500 mm of which 62% fall during July and August. The rainfall is characterized by high inter- and intra-annual fluctuations.¹ The annual average temperature is 28°C with a maximum monthly

average of 38°C in April and a minimum average of 15°C in January, the seasonal variations are weak; at the opposite, there is a strong daily amplitude, notably in the dry hot season. The potential annual evapotranspiration is 2,190 mm per year, but it is unequally distributed annually with spikes in March and April (235 and 230 mm, respectively) and a minimum in July and August (150 mm).

During the rainy season, livestock from the floodplain districts in Mopti usually migrate to graze in Douentza and are dependent on access to water resources during this time of the year. The seasonal movement of livestock between the floodplains is essential to local people's livelihood strategies in an area with frequent periods of drought and unstable climate conditions.

This general presentation might hide the fact that in Douentza district, topography



Map 2. Administrative map of Douentza district

and climate are not uniform and cover four main agro-ecological zones (see Bocoum et al., 2003: 12).

- *The Lakeside* or the lacustrian zone is characterized by the existence of several lakes and clayed ground. The vegetation is the savannah type shrub on which there are some *combrétacées*, *boscia* and *acacia albida*. This zone has a wetland like ecosystems similar to that of the inner Niger delta characterized by seasonally flooded plains. This complex ecosystem constitutes the basis for multiple livelihood strategies. Farmers and fishers may use the same area of land/water at different times of the year and herders search for pastures for their animals during the dry season due to potential of the perennial grass, locally known as the *bourgon* (Cotula and Hesse, 2006).
- *The Plateau* (Tray) is a mountainous zone which component element is a hard rock without ground. Vegetation incorporates *combrétacé* on few spaces which bear ground. This zone is characterized by a number of hills which reach altitudes from 600 to 1,100 m. Among these escarpments is Mali's highest point, Mount Hombori (1,153 m).
- *The Gourma zone*: Here are two types of soil: silty soils which can be found on drained plains and clayey soils found at the flooded plains. The vegetation is constituted of hydrophilic meadows, covered by *diospiros mespiliiformis*, of *acacia seyal* and a lot of *andropogon*, *pseudapricus* and *panicum*. Run-off from the plateau provides watercourses in this zone. These plots are covered with a dense bush .
- *The Seno*, the south-eastern zone of Douentza, consists mostly of huge sandy plains and a mixture of fields and pastures and grassy vegetation, the savannah compound shrub (*combrétacées*, *acacia albida*) on both the plains and dunes. The dunes do not move and are overgrown with grassed and herbs and a few trees in contrast to the bush areas. The zone is characterized by water shortage and livestock usually migrate from this area in parts of the year.

3.3 Hydrological data

3.3.1 Surface water

Douentza district is situated in the Niger basin, but the Niger River does not run through the district. The directly available water resources are the temporary water courses, lakes, and water tanks. The largest lakes (Kourarou, Aougoundou and Korientzé) are supplied by the Kolli-Kolli, a branch of the Niger River, and by rainwater. The water level and the flood duration in the lakes and other water storage points depend on the water flow in of the Niger River. Apart from the above-mentioned lakes, other surface water resources include small and temporary ponds.

The economic activities around these water points are agriculture, fishing and livestock-rearing. Most of the lakes and ponds are unfortunately small and dry.

Hydrometric data collection and tracking has only been done on the Kolli- Kolli, a branch of the Niger River supplying the main lakes. Map 3 below indicates the situation in Douentza district in the Mopti region.

3.3.2 Ground water

Ground water is used for people and livestock. In Douentza District, surface water is mostly non-perennial and therefore only available during part of the year.

The drought taking place in Mali since the 70's has lowered the ground water table and caused water depletion of the traditional water points (temporary ponds and shallow wells). As a consequence, new water points (wells and water drilling) have been developed, in order to harvest water from deep aquifers, which are less dependent on climatic variations.

According to the information system SIG-MA 2² on water points, Douentza district has 272 wells of which 215 are permanent, and 279 water drillings out of which 224 are equipped.

The spatial and temporal variability of ground water aquifers in Douentza is difficult to assess due to the lack of tracking of the hydraulic gradient level.

Map 3. Douentza district in Mopti Region



4. SPATIAL AND TEMPORAL DISTRIBUTION OF EVENTS

4.1 Spatial distribution of events

The 195 water events identified during the inventory concern 22 communities (refer to Table 3 and Figure 3). Indeed, in some villages there was found eight times more events than in others. This is, for example, the case of Hombori where 37 events occurred, while in Kel-Tagassit and Guenedoundé only 2 events occurred. According to the number of events, Drimbé follows Hombori, with 17

events, and N'Gouma occupies the third position with 16 events.

In the case of Hombori the large number of events found might have to do with at least two related aspects:

First, since Hombori is a semi-urban town (about 4,000 inhabitants), the rural water supply requires a complex management system which may increase the number of potential conflicts. Second, more time was spent in Hombori as it has been chosen as a preliminary case study site. During the in-depth studies, it will be elaborated whether staying for a

Table 3. Distribution of events across communities

Number of events

<i>Community</i>	<i>Character of events</i>		<i>Agro-ecological Zone</i>
	<i>Conflictive</i>	<i>Cooperative</i>	
Boumban	3	7	Gourma
Douentza	2	5	Gourma
Drimbé	11	6	Gourma
Dioni	0	3	Plateau
Falembougou	2	3	Gourma
Guenedoundé	0	2	Plateau
Hombori	19	18	Gourma
Kel Tagassit	0	2	Lacustrian zone
N'Gouma	2	14	Lacustrian zone
Niangassadiou	0	8	Séno
Ouro-Fassy	3	9	Séno
Ortongo	1	2	Séno
Dendia	4	1	Lacustrian zone
Sobo	10	5	Lacustrian zone
Doundé	6	3	Lacustrian zone
Saraféré-Mirgna	2	2	Lacustrian zone
Sorobougou	3	0	Lacustrian zone
Boni	6	7	Séno
Tombori	2	2	Gourma
Toulewendou	7	1	Séno
Bounty	3	0	Gourma
Modoro Dogon	1	8	Séno

long time in a location with a complex water management system influences the number of events collected, as for example in the case of the water supply in Douentza (semi-urban).

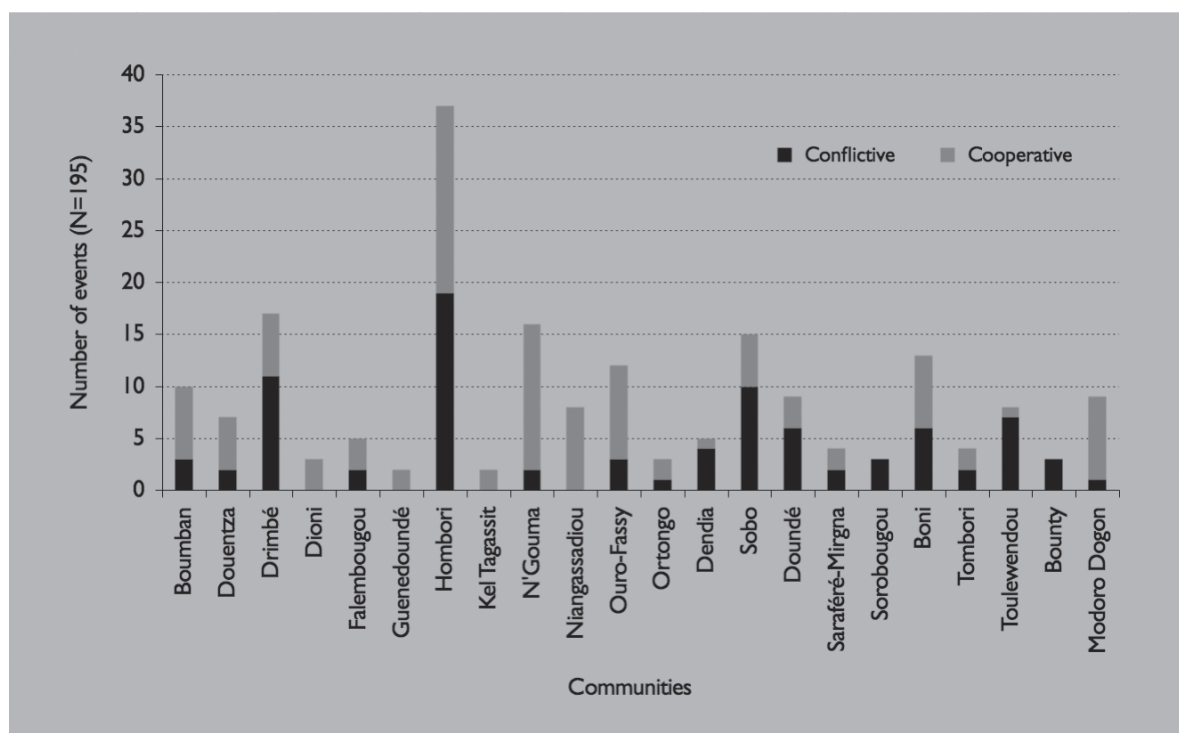
The cooperative events are more numerous in Hombori (18), i.e. 17% of all cooperative events, and N’Gouma (14), i.e. 13%, followed by Ouro-Fassy with 9 cooperative events, i.e. 8% of all cooperative events identified in Douentza district. Concerning the conflictive events, most of them are identified in Hombori (19), i.e. 22% of all the conflictive events; in Drimbé (11); i.e. 13%, in Sobo (10) corresponding to 11% of all conflictive events identified in Douentza district.

Viewed on the basis of agro-ecological zones, events are concentrated in the Gourma agro-ecological zone (83 events) of which 42 are conflictive events and 41 cooperative, and in the Lacustrian agro-ecological zone

counting 54 events equally distributed among conflictive cooperative events (Table 3 and Figure 3).

The fact that conflicts are more numerous in Gourma agro-ecological zone, and as part of this in Hombori, may be explained by scarcity of water resources in the dryland areas of Douentza. On the other hand, the different conflicts identified in the Lacustrian zone are linked to the presence of the river which is the main water source for farmers, pastoralists and fishers. In Drimbé, the presence of a pond during the rain season is the source of conflict between pastoralists and farmers from the municipality of Débééré. Concerning Sobo, the problem is also linked to the presence of the river Kolli-Kolli. Thus, scarcity is not the main reason in Sobo and Drimbé, but, as we will see later, the availability of water resources and difficulties to manage access for

Figure 3. Distribution of identified events among communities by character
Number of events



different categories of users are main factors for explaining the conflictive events.

However, in addition to the influence of the agro-ecological and hydrological factors in the above-mentioned conflictive internal competitions exists inside the communities, among the original inhabitants, and between these original inhabitants and the so-called *allochtones* (i.e. foreigners or new-comers). In Hombori, the original inhabitants and the recently settled households compete to appropriate water sources in order to gain supremacy.

4.2 Spatial scale of events

The data analysis shows that of the 195 events identified, 134 (i.e. 69%) are identified within single communities (intra-community events), while 60 events taking place between two or more communities (inter-community events) were (i.e. 31%). Only one among the identified events concerns two different districts (Douentza district and Gourma Rharous). In

the analysis presented below, this event has been included in the category of inter-community event.

As can be seen from Figure 4 below, cross analysis shows that of the 134 intra-community events, about 90 (corresponding to 67% of the intra-community events) are cooperative events and 44 (33%) are conflictive, while the inter-community events are mainly conflictive (72% of the inter-community events). As it will be shown later, intra-community events are in general of small scale and are less frequently reported outside the location of the event.

4.3 Temporal distribution of events

4.3.1. Seasonal distribution of events

The inventory results show that more than three quarters of the water-related events (77%) take place in the dry season while one quarter (23%) occurred in the rainy season.

Figure 4. Spatial scale of events by character

Number of events

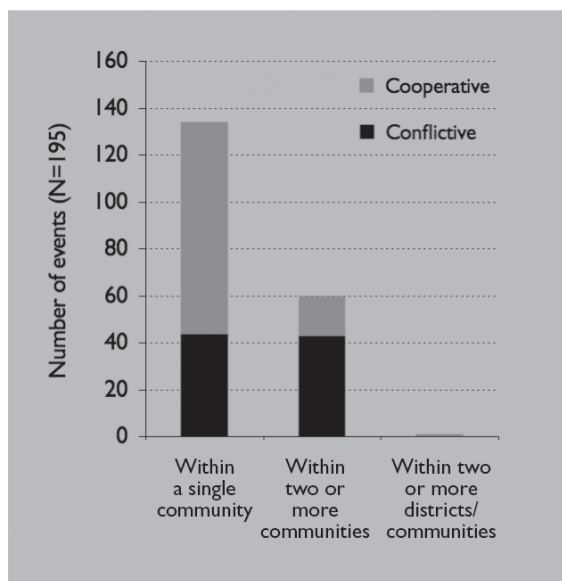
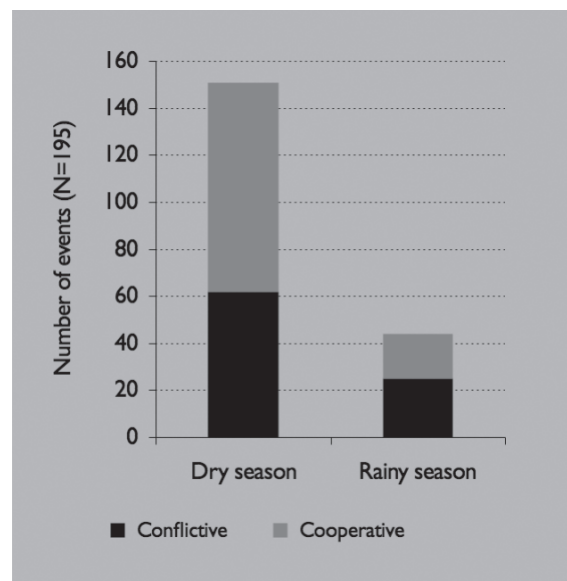


Figure 5. Seasonal distribution of events by character

Number of events

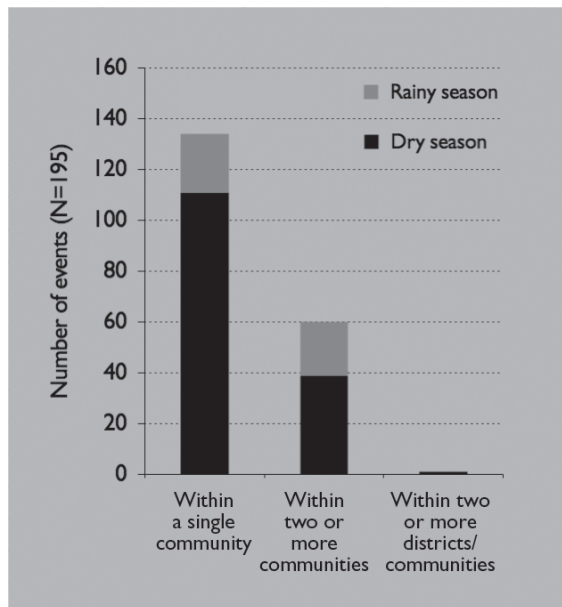


This situation is related to the fact that during the rainy season, there are fewer stakes linked to water resources because there are relatively sufficient water sources. However, the seasonal mobility of herds from the flooded Inner Delta and the presence of transhumant herders can give reason to the relatively small number of intra-communal conflicts and cooperative events during the rainy season.

The analysis of the seasonal distribution according to the character of the events shows that of the 151 events taking place during the dry season, 62 (corresponding to 41%) are conflictive while 89 (59%) are cooperative (Figure 5), while of the 44 events registered in rainy season, 25 (57%) are conflictive and 19 (43%) are cooperative.

Figure 6 below shows that among the 134 registered events which take place within a single community, 111 (corresponding to 83%) occur during the dry season and only

Figure 6. Seasonal distribution of events according to spatial scale by character
Number of events



23 events (17%) occur during rainy season. Among the 60 inter-community events, 39 (65%) occur in the dry season and 21 (35%) in the rainy season.

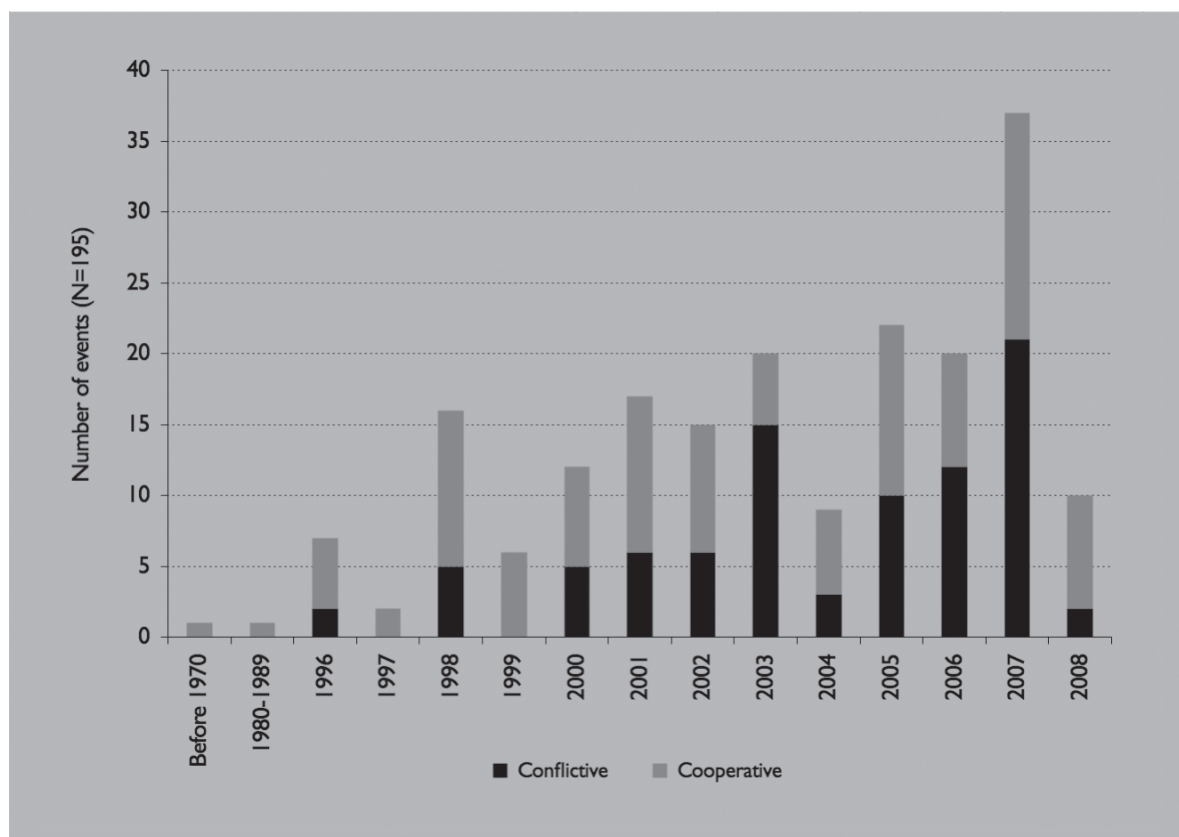
4.3.2 Events duration (starting year)

Figure 7 below shows that the majority of events have taken place recently. From 1996 to 2000, few events occurred: only 43 events (22%); from 2001 to 2005 this number was multiplied by almost two (83 events, i.e. 43%). From 2006 to 2008, in three years, 67 events (34%) occurred.

The exponential growth of events after 2000 may be explained by three factors:

- At first, it may express a bias, linked to the fact that when an event is not reported, it is a veritable challenge for local actors to indicate the date; they remember more recent events better.
- The second explanation is that at the end of the 1990, several important infrastructures of modern wells and drinking water supply have been constructed. The implementation of new infrastructures may result in the high number of conflictive and cooperative events.
- Finally, in the 1990, the Malian government adopted an important decentralization reform which was implemented from 1999. In many parts of the country, the decentralization process has reawakened the feelings of local identities, resulting in actions of marking and appropriation of territories and resources considered belonging to ancestors. In the same way, political competition for the leadership of municipalities is also reflected in the number of conflicts for water. It should also be stressed that some of the water-related situations and events took their beginning before 1995 and are still on-going.

Figure 7. Temporal distribution of events by character

Number of events

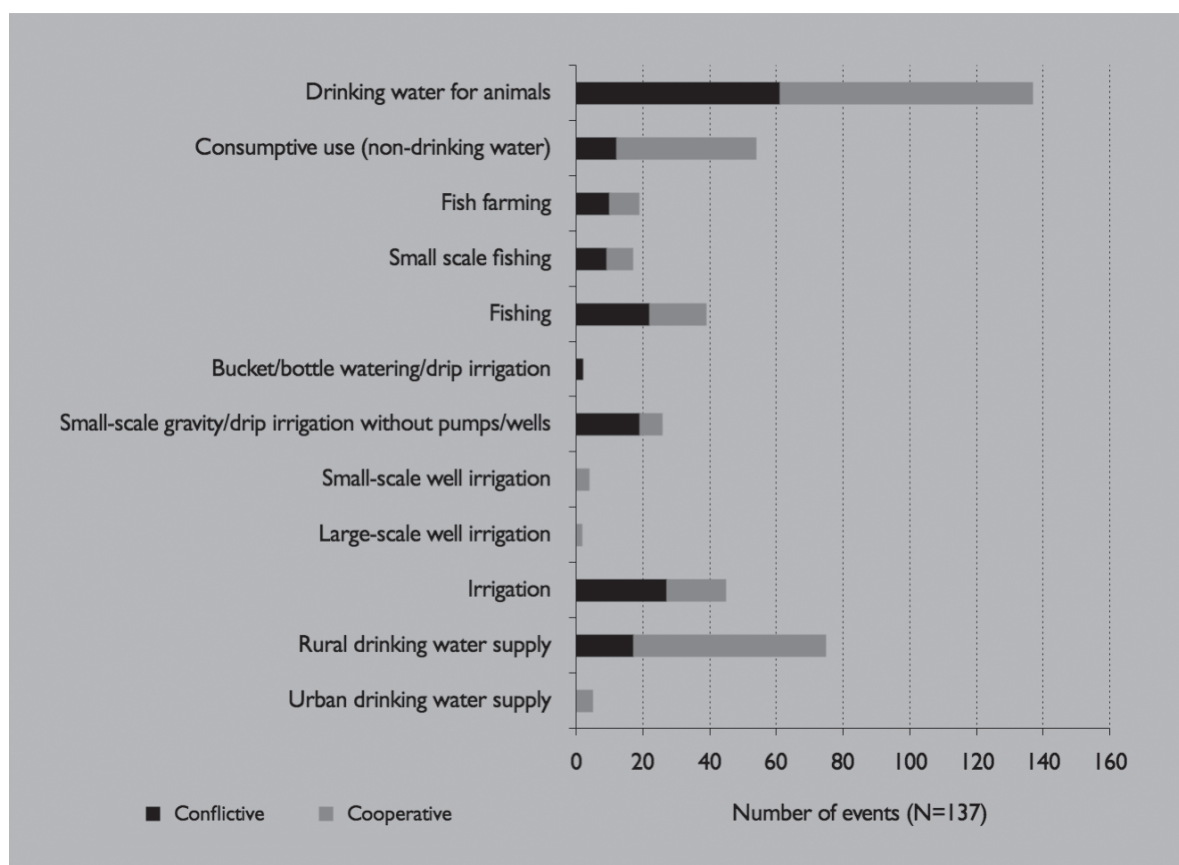
5. NATURE OF EVENTS

5.1 Water use types of conflictive and cooperative events

During the survey, six main water uses were identified: drinking water for animals, drinking water for humans, fishing, fish farming, irrigation and other consumptive uses (non-drinking water).

The data analysis confirms the pastoralist vocation of Douentza district. Indeed, among the 195 registered events, drinking water for animals is involved in 137 times (Figure 8). Rural drinking water supply is associated with 75 events, thus being the second most frequent. Other consumptive uses of water (non-drinking water) are associated

with 54 events, and irrigation is involved in 45 events. In addition to pastoral activities, the population of Douentza district practices agriculture. The agricultural activity is practiced during the rainy season, and there are no large-scale irrigation schemes in Douentza district. Urban drinking water supply is undeveloped too. Only in the semi-urban centres of Douentza district, i.e. Hombori, Niagassadiou and N'Gouma, modern water supply exists. The conflictive events involving drinking water for animals (61 events) are relatively numerous in comparisons with other water uses. Conflictive events about irrigation concern 27 events and conflictive events involving rural drinking water supply are 17.

Figure 8. Water uses associated with events by character*Number of events^a*

^a Each event may be associated by more than one type of water use.

5.2 Use diversity of conflictive and cooperative water-related events

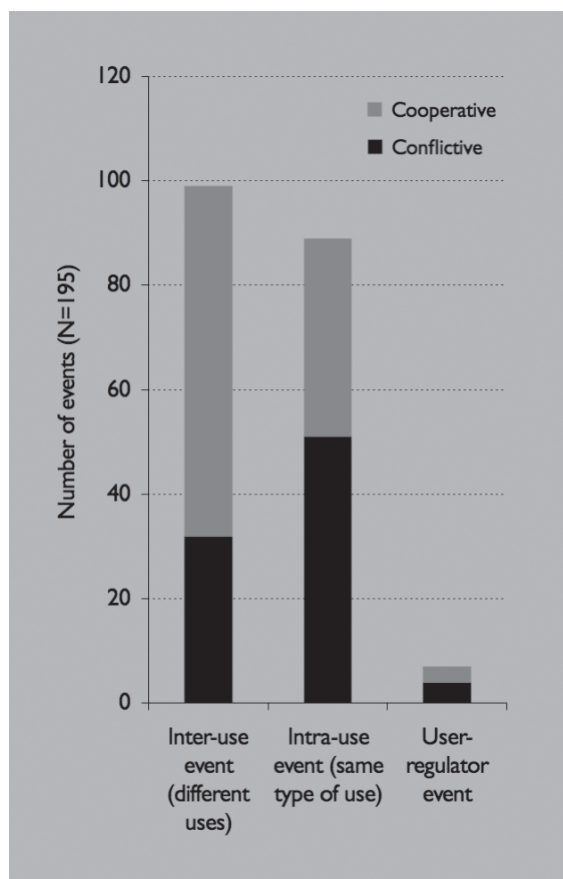
In the Douentza district, inter-uses events, i.e. events that involve more types of water use, are more numerous than the intra-uses events. Among the 195 events, 46% take place between users who wish to use the water for the same type of use against 51% of the events which take place between users who wish to use water for different types of use. The last four percent of the events take place between direct water users and water regulators. Given the agro-pastoral character of the Douentza district, the inter-use events emerge mostly between the consumptive (non-drinking) and

pastoralist uses. We noticed that the sources of supply for consumptive (non-drinking and watering) are often different. That explains why the inter-uses events are less frequent than the intra-use events.

Among the 99 inter-use events, there are 32 conflictive events and 67 cooperative. As we can see (Figure 9), cooperative events constitute approximately two thirds (68%) of the inter-use events while conflictive events constitute one third (32%) of the inter-use events. Of the 89 intra-use events, 51 events (57%) are conflictive and 38 (43%) are cooperative. Thus, conflictive events are more frequent among the intra-use events while

Figure 9. Water use diversity by character of water-related events

Number of events



cooperative events are more frequent among the inter-use events.

5.3 Issues of conflictive and cooperative water-related events

As mentioned above, drinking water for animals and rural drinking supply are the dominant water uses associated with the events which have occurred in Douentza district. Event issues associated to these two types of water use are the most important. In the identified conflictive events, the dominant issues are contestation of rules (60) and competing claims of access for consumptive use (15).

Those two are followed by issues related to water scarcity (5), drinking water supply (3) and timing for watering animals (2). Concerning cooperative events, the main issues involved are the need for drinking water supply (50) and water scarcity (43). Other issues involved are timing for watering animals (9), competing claim of access for consumptive use (4), etc. (Figure 10).

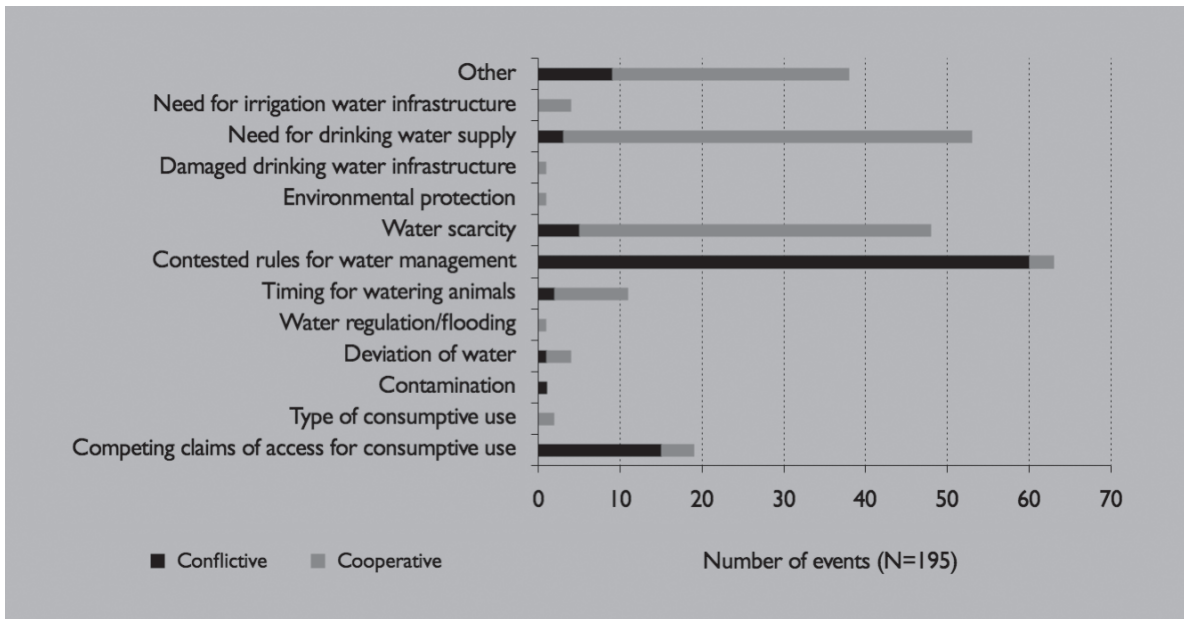
Overall, issues related to contested/competing rules are the most frequent for the identified conflictive events. This may be explained by the existence of legal pluralism in rural areas: the co-existence of state rules, communitarian rules, etc. Management rules are not always obvious to all users, particularly from outside the community. It also happens that people know the rules but do not respect them in order to express their contestation of local resources managers' or owners' legitimacy.

The most frequent issue for cooperative events is 'need for rural drinking water supply'. This reveals that rural drinking water supply is a serious problem and people try to join efforts in order to find a solution. On the other hand, the high number of cooperative events can also be explained by the fact that the issue of the cooperative events concerns intra-use events, such as consumptive and drinking uses.

It is necessary to emphasize that many issues of identified events (38 events) were not mentioned in the inventory formats and were registered as 'other issues'. That is related to the fact that as water situations evolve, events may occur (in particular conflictive event) which do not directly deal with a water. This is for instance the case when instances of physical violence occur as part of a water situation. Such instances may be treated by authorities (justice or prefect), in which case the issue does not appear clearly as water-related.

Figure 10. Event issues by event character

Number of events



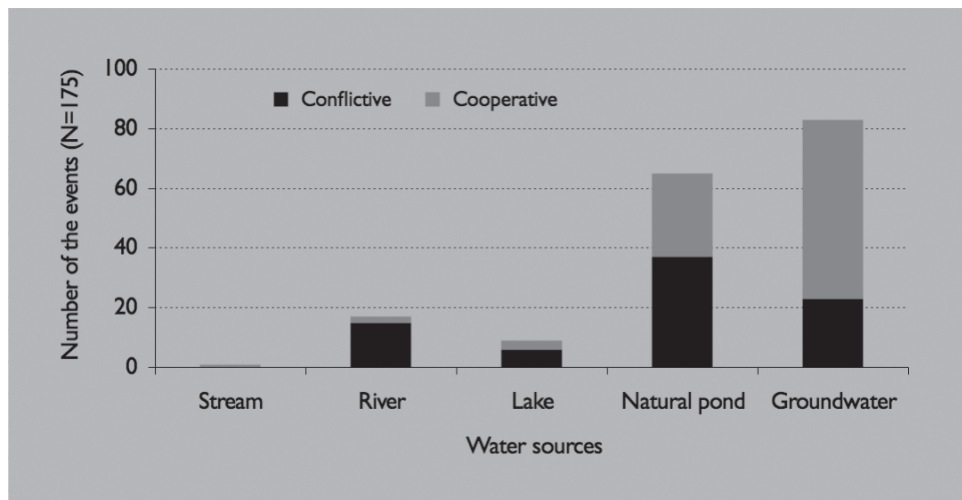
Among the 38 issues not directly related to water events but specified by the informants, 17 may be classified as negotiated agreement (*accord négocié*), 11 as pacific resolution and 10 as contested ownership.

5.4 Type of water source and infrastructure involved in water events

Surface and ground water resources constitute important water sources for different activities in Mali. In Douentza district, natural sources of

Figure 11. Water sources involved in conflictive and cooperative water-related events in Douentza district by character

Number of events



water supply are predominant. Among these, natural ponds and groundwater are predominant, corresponding to respectively 65 events and 83 events of the total of 195 events. Seventeen events concerned river water.

5.5 Types of infrastructure involved in the events

In Douentza district, water supply is characterized by the lack of modern water infrastructures. Among the 195 events identified, 38 concern piped water, one concerns tank, three concern shallow wells, six concern hand pumps, 24 concern electrical/diesel pumps and three concern artificial ponds. Most frequent are events concerning wells which account for 48 events.

The predominance of the events related to wells may be explained by the fact that in Mali, in general, wells constitute the main

source of water supply, in particular for consumptive uses.

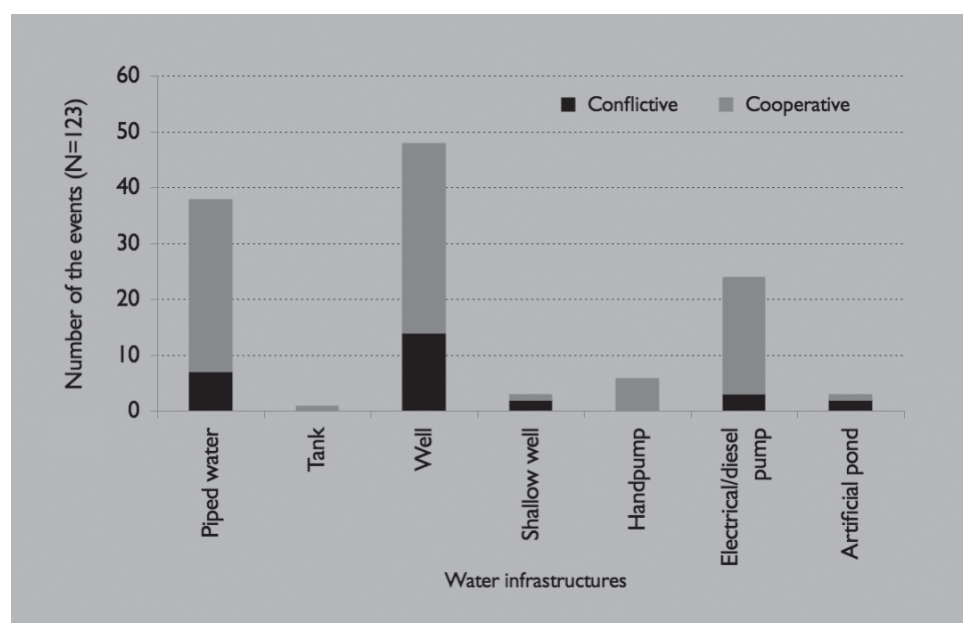
The cooperative events (71%) involving wells are more numerous than conflictive events (29%). As wells are the main infrastructures of drinking water in rural areas, their implementation and management give rise to small conflictive and cooperative events.

5.6 Ownership of water source involved in the events

Most of the identified events concern communal/public water, with respectively 54 for the conflictive events and 92 for the cooperative (Figure 13). These events are followed by events related to water about which the *de facto* ownership is contested (22 conflictive events and 9 cooperative events). Five events (4 conflictive and 1 cooperative) concern water that passes through/is at private property

Figure 12. Water infrastructure involved in conflictive and cooperative water-related events in Douentza district by character

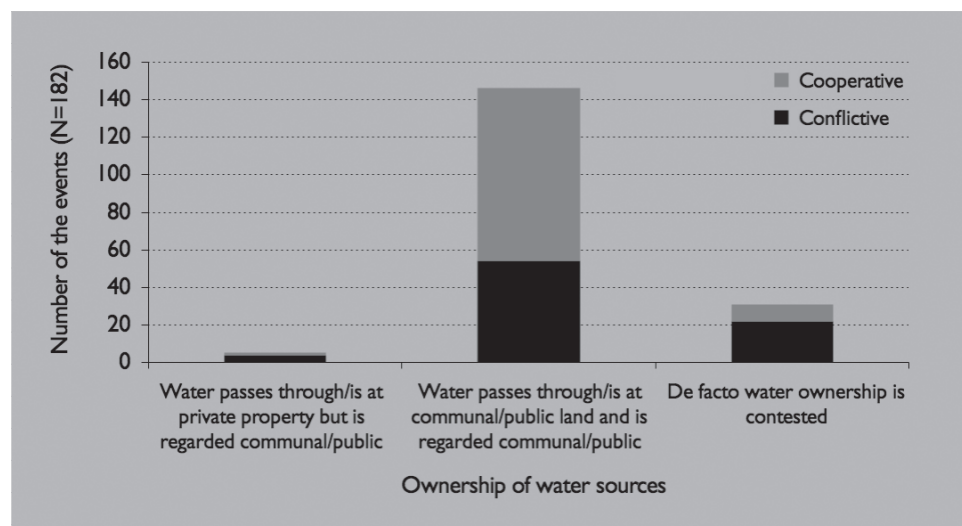
Number of events^a



^a Information is either missing or no infrastructure is involved in 72 events

Figure 13. Ownership of water resources involved in conflictive and cooperative water-related events

Number of events^a



^a Information is missing about 13 events.

but is regarded as communal/public. The fact that communal/public water is involved in many events (conflictive and cooperative) means that despite of the numerous problems, people collaborate in order to resolve the problems.

6. EVENT STAKEHOLDERS AND THEIR ACTIONS

6.1 Direct parties involved in the events

Parties directly involved in water-related events are mostly water users (e.g. domestic water consumers, irrigation farmers, livestock keepers), community authorities (headmen, community leaders) and authorities in charge of water management and infrastructure development at different levels (Figure 14).

When a conflict between water users takes place in a community, most of the time, the problem is raised in a regular community

meeting or reported directly to the community leader. If the conflict cannot be solved by community committee or community leader, local government authorities (mayor, municipal authorities) will be involved to solve the conflict. When this involvement does not lead to a result, state representatives or legal institutions will be involved. But, it is necessary to underline that legal institutions are rarely requested for resolving conflict over a water point. Legal institutions are in general involved only when a water conflict leads to physical violence.

However, water users may also collaborate with each other, with community leaders or with authorities at different levels to solve water conflicts or to improve/develop water infrastructure. Therefore, community leaders (rural domestic water consumers, headman/ chief, community leader or local government authorities are involved in a very large number of events. Also, groups of pastoralists/livestock keepers and the category of

other party/parties are frequently involved in water-related events (Figure 14).

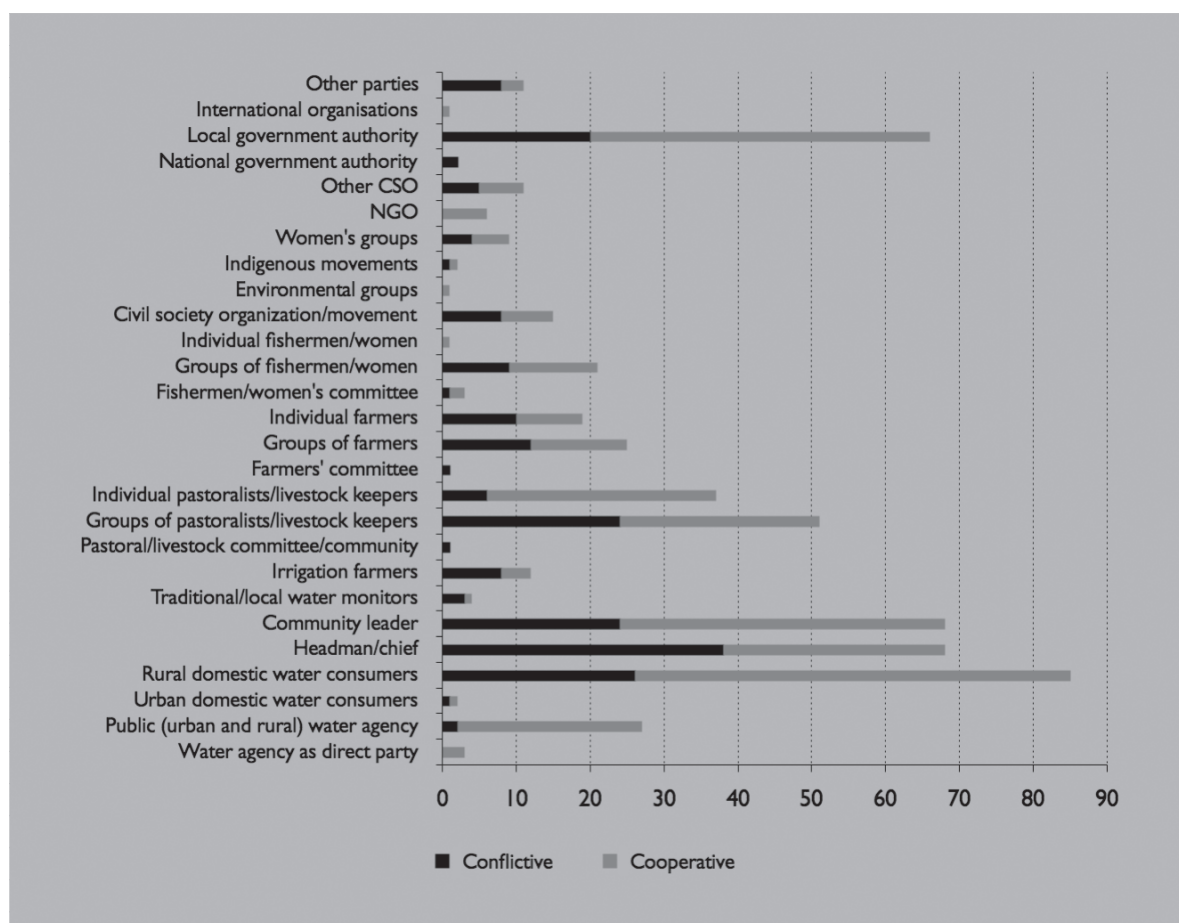
Authorities at national level and international organizations are also directly involved in a number of events, more so in cooperative than in conflictive events. Support to funds for constructing wells, hand pumps and artificial ponds is the main activity in this type of cooperation.

The five parties which are most frequently involved in the events are rural domestic consumers (85 events), headman (68 events), community leaders (68 events), local government authorities (66 events) and groups of pastoralists (51) (Figure 14).

The rural domestic water consumers are more frequently involved in cooperative events (59) than in conflictive events (26). This also applies to community leaders who were involved in 44 cooperative events and in 24 conflictive events, and the local government authority which was involved in 46 cooperative events and in 20 conflictive events. The community headman/chief tends to be equally frequently involved in conflictive events (38) and in cooperative events (30) just as pastoralists groups who were involved in 27 cooperative events and in 24 conflictive events.

Figure 14. Parties directly involved in water events by character

Number of events^a



^a Each event may involve more than one type of direct parties

6.2 Event magnitude

It follows from the Figure 15 that the number of persons directly involved in the events is relatively low. Indeed, in 20% of the identified events, less than 10 persons are involved per event. In another 40% of the events between 10 and 99 persons were directly involved while in 38% of the events involved between 100 and 999 persons. Only two percent of the events involved between 1000 and 9999 persons as direct actors. However, it is necessary to underline that the number of persons involved as direct actors could only be estimated for 93 of the identified 195 events.

Regarding the gender character of involvement, it appears that men are actively involved in about 86% of identified events. Men and women are equally actively involved in only nine percent of the events while more women are actively involved in the remaining five percent of the events (Figure 16). This situation reflects that in the Malian society, water management is considered as a man's prerogative rather than a woman's. Women play a big role in the social life but are not very visible on the public scene. It is necessary to underline that it was only possible to assess the gender character of involvement in 185 of the identified 195 events.

Figure 15.
Number of persons directly involved in events by character
Number of events

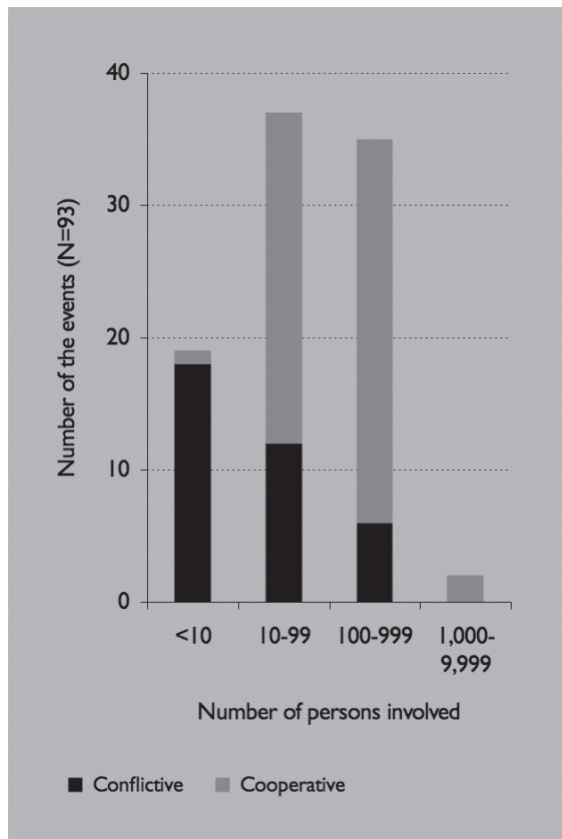


Figure 16. Share of estimated number of men and women directly involved in water events by character
Number of events

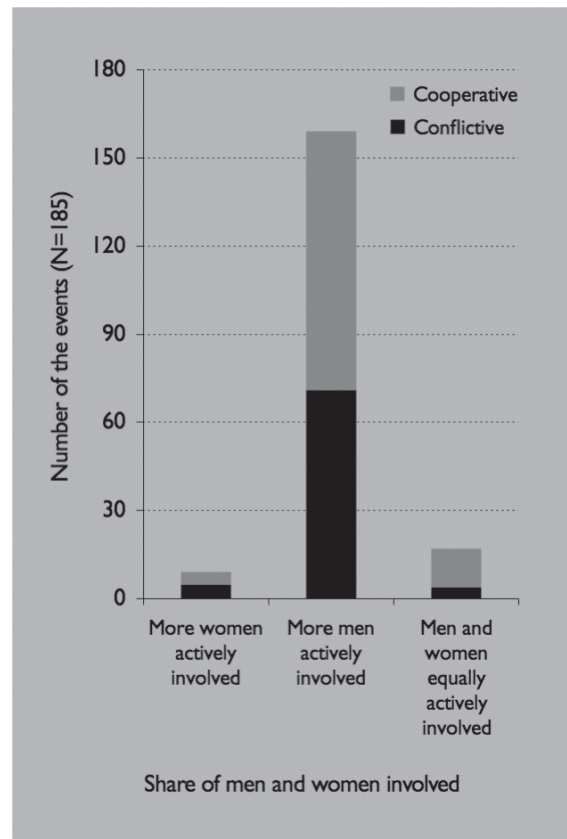


Figure 17. Number of estimated persons benefiting/affected by events by character

Number of events

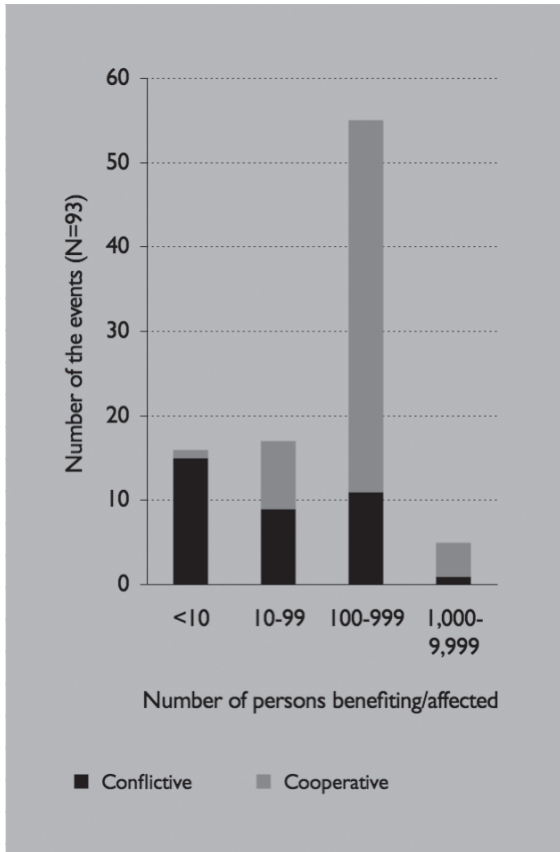
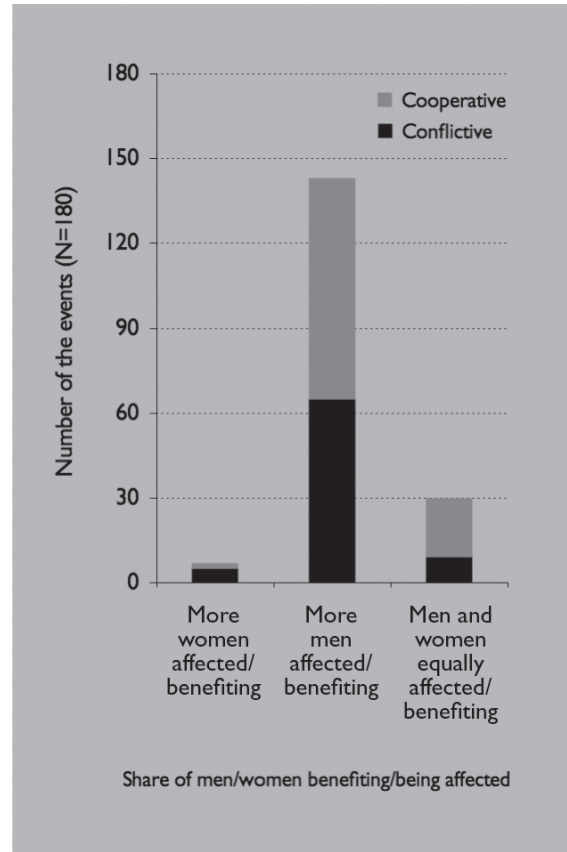


Figure 18. Estimated share of men/women affected by/benefiting from the events by character

Number of events



Less than 10 persons are affected (or benefit) in 17% of the events while between 10 and 99 persons are affected/benefit in 18% of the events. Between 100 and 999 persons are affected in 59% of the events and between 1,000 and 9,999 persons are affected in five percent of the events (Figure 17).

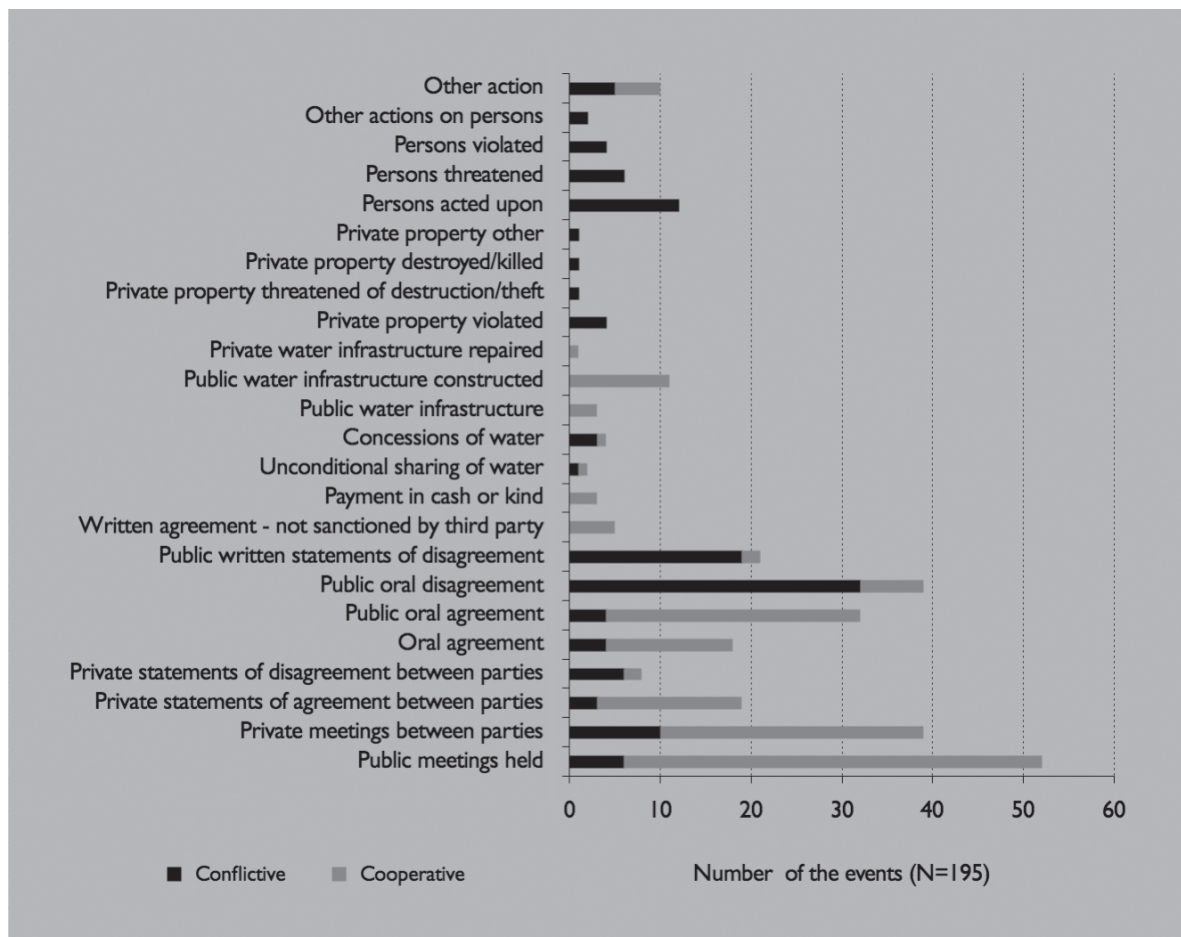
Regarding the gender character of the persons benefitting or being affected, it appears that men are affected in about 79% of the events. Men and women are equally affected in only 17% of the events while more women are affected in about four percent of the events (Figure 18).

6.3 Types of actions taken during events

Public meetings held (in 52 events), public oral disagreement (in 39 events), private meetings between parties (in 39 events), public oral agreement (in 32 events) and public written statements of disagreement submitted to third parties (in 21 events) are the most numerous types of actions taken by the parties (Figure 19). Together, they constitute the main actions taken in the 195 registered events. Concerning conflictive events, one can observe that public oral disagreement (in 32 events) and public

Figure 19. Type of action taken by the parties during conflictive and cooperative water events

Number of events^a



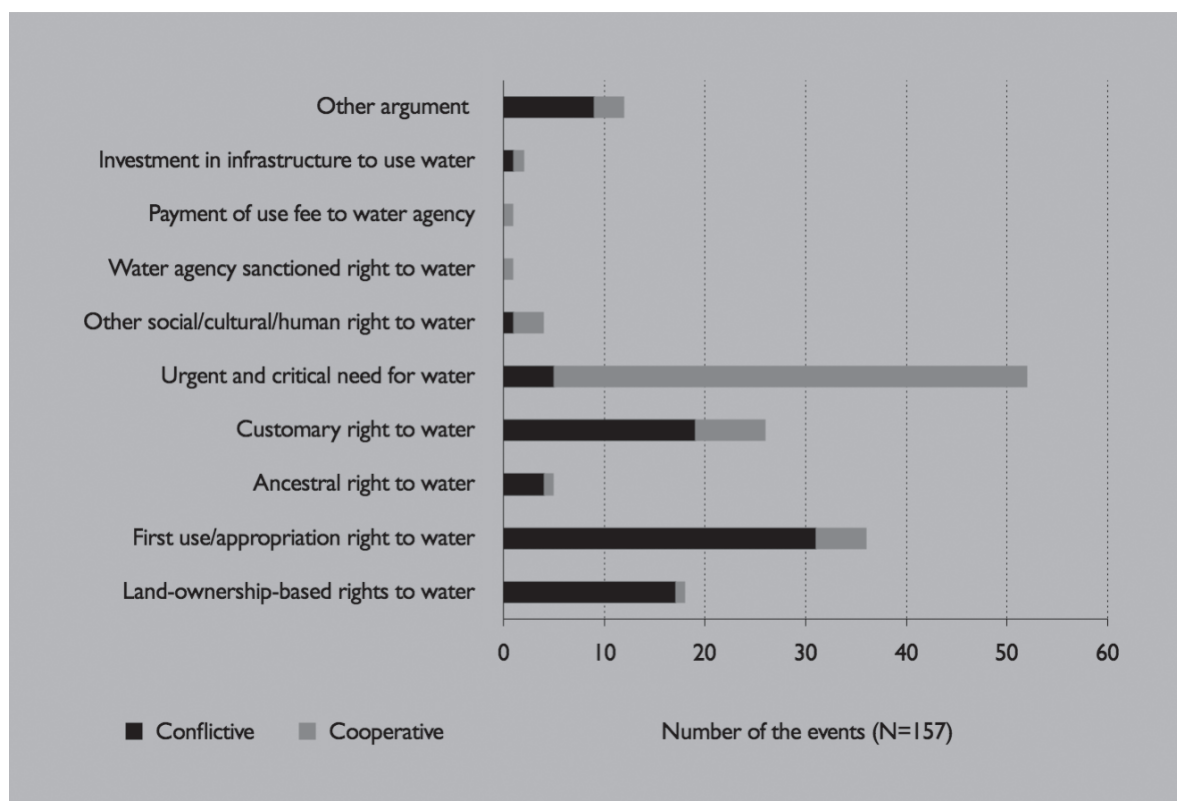
^a Each event may involve more types of actions.

written statements of disagreement submitted to third parties (in 19 events) are still dominant, but with persons acted upon (in 12 events) as the second most important type of action taken. Concerning cooperative events, one can observe that public meetings (in 46 events), private meetings between parties (in 29 events), public oral agreements (in 28 events), private statement of disagreement between the parties (in 16 events) and oral agreements (in 14 events) are dominant.

6.4 References used to claim in the events

In Douentza district, the references used by parties to support their claims or access to water are diverse. Among them, the reference to urgent and critical need for water occupies the first place being used in 52 of the 157 events for which information is available about how claims are supported (about 33%) (Figure 20). This reference is followed by the reference to first use/appropriation right to water (23%), customary

Figure 20. References used to support claims in conflictive and cooperative water-related events in Douentza district by character



right to water (17%) and reference to land ownership-based rights to water (11%). The other references concern ancestral right to water (3%) which can be added to customary right to water, and other (than mentioned) social/cultural/human right to water (3%).

It is important to notice that the references indicated above are rarely supported by written proofs.

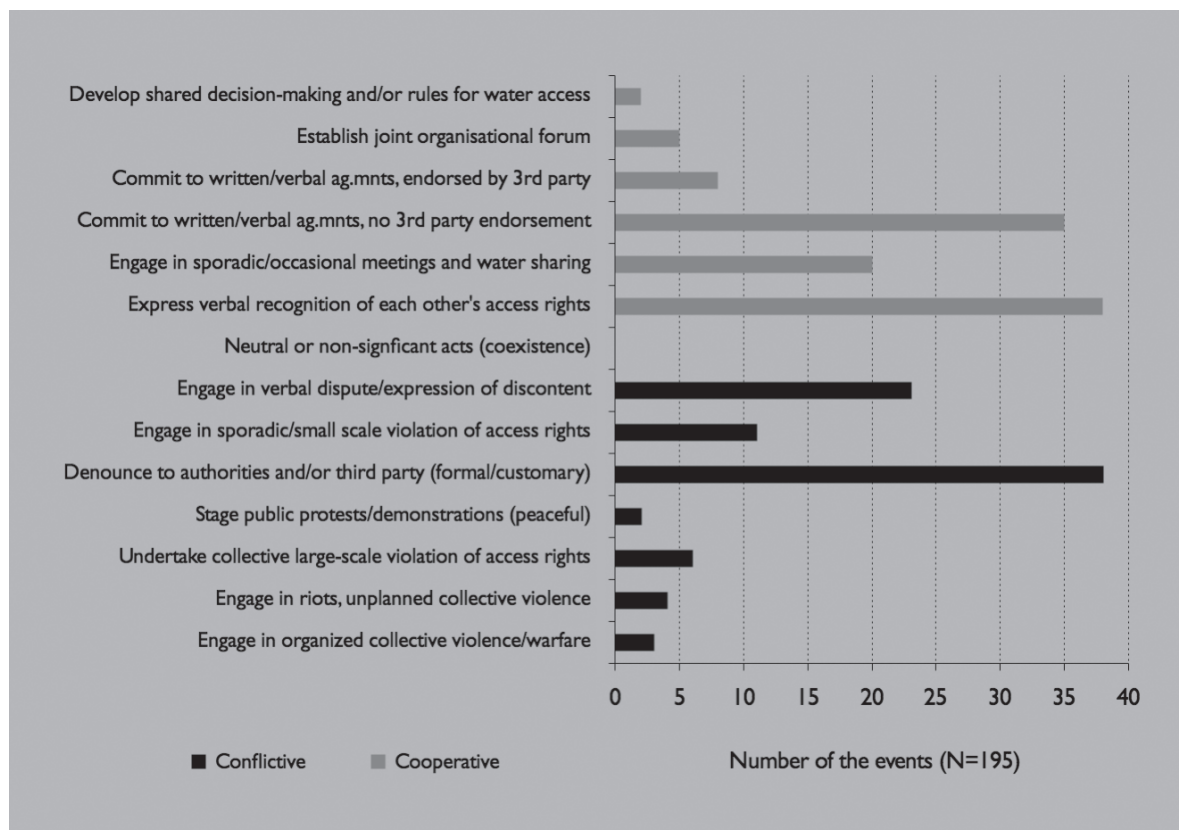
7. INTENSITY OF EVENTS

Based on the scale developed by the Competing for Water program (see Table 1 above), the intensity of the collected events has been assessed.

Among the 87 conflictive events for which the intensity could be assessed, 38 events were characterized by the intensity '-3'; 23 events with an intensity of -1 and 11 events with intensity of -2. They concern denunciation to authorities, recourse to third party (formal/customary), sporadic/small-scale violation of access rights, verbal dispute (expression of discontent).

The intensity scale of cooperative events ranges from scale 1 to 7. Of the 108 cooperative events for which the intensity could be assessed, there are 38 events with intensity scale of 3, i.e. 35% of all cooperative events, 35 events (32%) with intensity scale of 1, and 20 events (19%) with intensity scale of 2. The result of the intensity assessment is presented in Figure 21.

Figure 21. Distribution of water-related event according to intensity scale



8. THIRD PARTY INVOLVEMENT

Third parties are involved in several events.

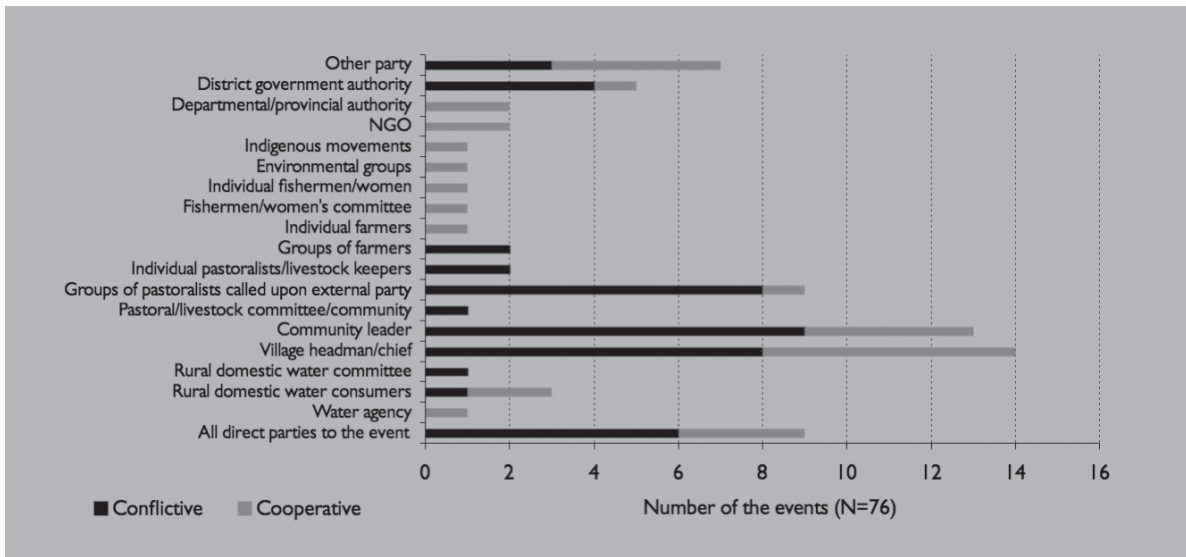
8.1 Formal demands and stakeholders calling upon third party

Among the 195 identified events, there are 76 events which have been submitted to external authorities. Among these, 45 are conflictive, i.e. 59%, while 31 are cooperative (41%).

The stakeholders, who called upon third parties, are mostly village headmen (in 14 events) and community leaders (in 13 events) (Figure 22). The village headman has called upon third parties in eight conflictive events and six cooperative events.

On the other hand, the communities' leaders have called upon third parties in nine conflictive events and in four cooperative events. It should be underlined that when community-elected leaders call upon a third party, it is in general at the request of village headman. As the headman of the village acts in the name of the whole village, all the direct parties to the event rarely call upon a third party. The same principle is valid for groups of pastoralist (in nine events) and groups of farmers (in two events). The analysis shows that in general the requests are not made individually: only in four events (5%) individual fisherman, individual pastoralist and individual farmers called upon third party.

Figure 22. Stakeholders calling upon third party

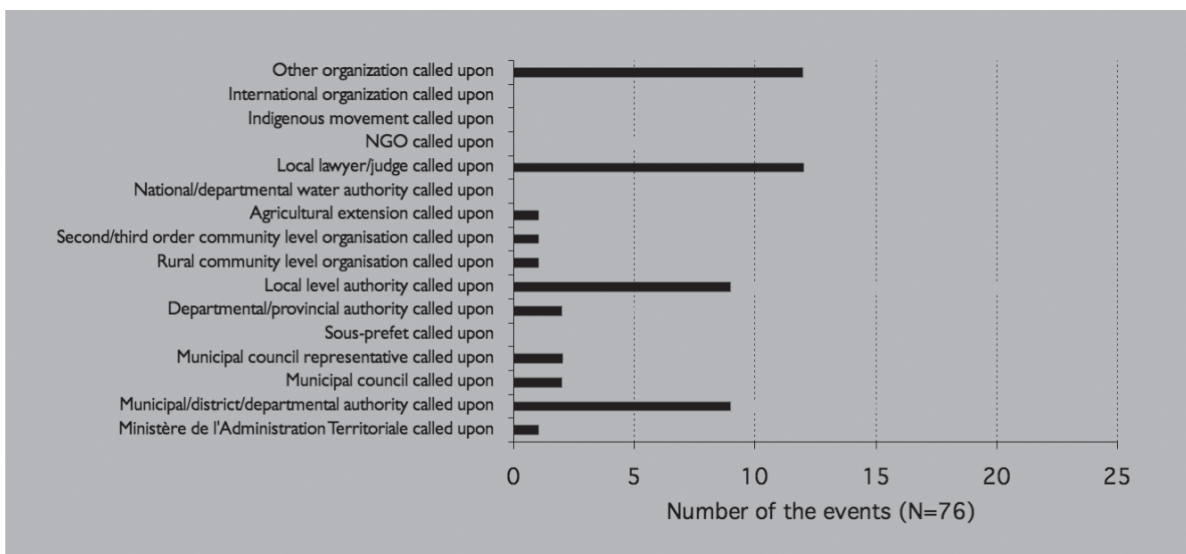


8.2 Types of third parties called upon

Third parties called upon are in general institutional actors (Figure 23). Different types of third parties were called 91 times by stakeholders: 52 times related to conflictive events and 39 times related to the cooperative events. Two

or more third parties may be called upon in the same event. The mainly called-upon third parties are: local level authority (21 events), municipal/district/departmental authority (15 events), lawyer/judge (12 events). It follows from these results that local-level authorities are the most called-upon third parties.

Figure 23. Types of third parties called upon
Number of events



9. EVENT OUTCOMES

9.1 Assessment of who gained in the events

Data analysis shows that events have different impacts for different parties. The identified water-related events have more positive (235 responses) than negative effects (168 responses). Among the 168 events in which some parties have negative impacts, 112 persons consider that nobody lost, i.e. for 67% there are no losers.

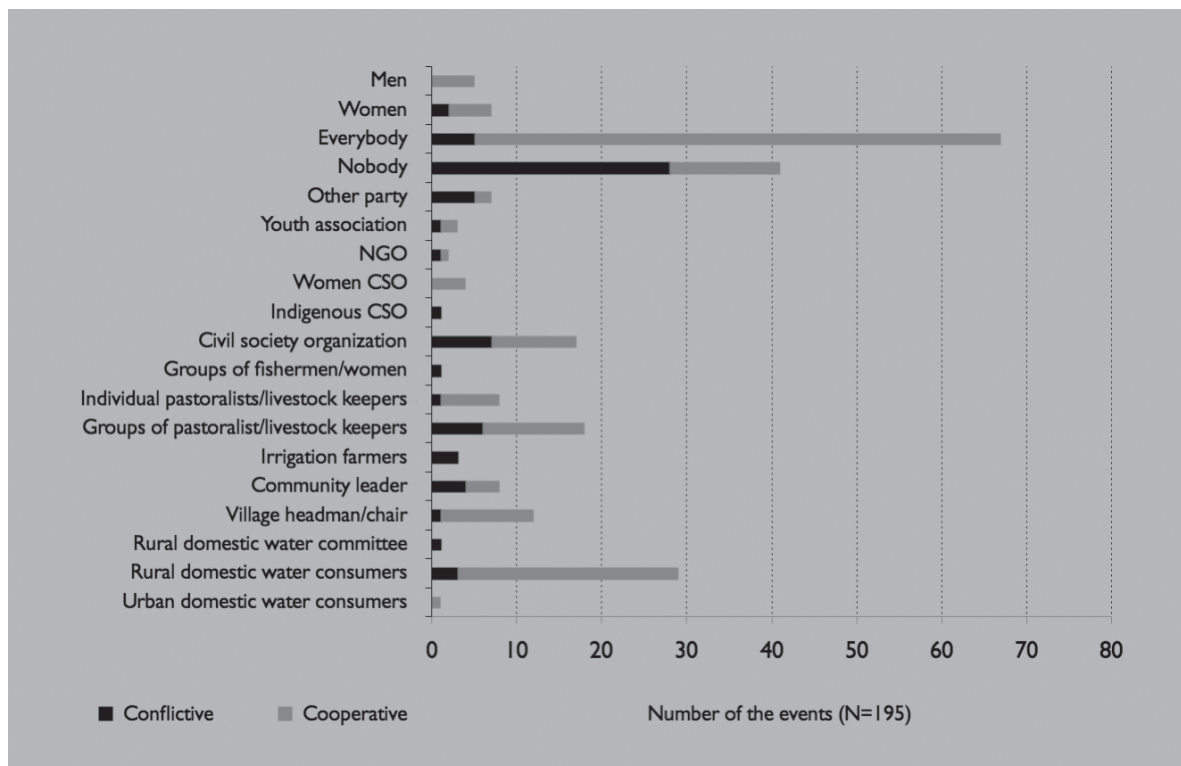
Concerning positive outcomes there are 41 answers for ‘nobody gained’ and 67 for ‘everybody gained’. These two together give 46% in total. Among the 41 events in which nobody gained, 28 are conflictive and 13 cooperative. The fact that there are 68% responses

‘nobody gained’ for conflictive events underline the fact that most of the time conflicts are resolved ‘friendly’ and the effects are minimized. Sixty-two of the 67 responses telling that ‘everybody gained’ are associated with cooperative events.

As it follows from the Figure 24 below, those who most frequently are assessed to gain are rural domestic water consumers (in 29 events), groups of pastoralists/livestock keepers (in 18 events), civil society organizations (in 17 events), village headmen (in 12 events), community leaders (in eight events), individual pastoralists (in eight events), and women (in seven events). These events are mostly cooperative. For the other actors, the number varies between one and five.

Figure 24. Party assessed to gain in conflictive and cooperative events

Number of events^a



^a Each event may have more than one type of party assessed to gain from the event.

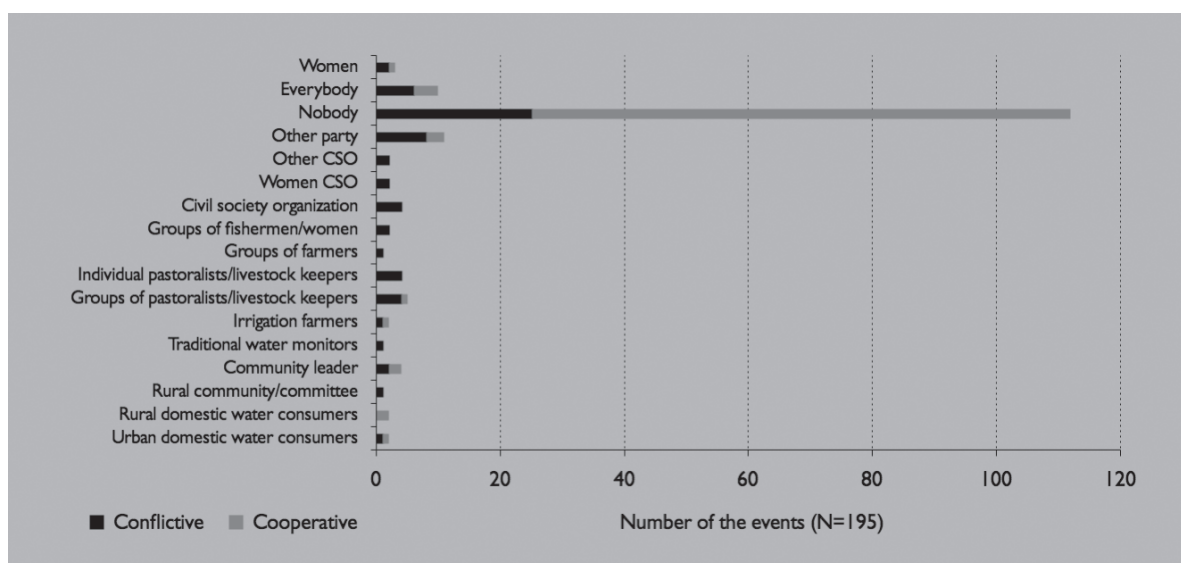
9.2 Assessment of who lost in events

The answer ‘nobody lost’ characterizes most of the events (112) among which 87 are cooperative events and 25 conflictive. The answer ‘other party’ lost concerns 11

events, among which eight are conflictive and three are cooperative. At last, follow ‘everybody lost’ with 10 events, of which six are conflictive and four are cooperative events.

Figure 25. Party assessed to lose in conflictive and cooperative events

Number of events^a



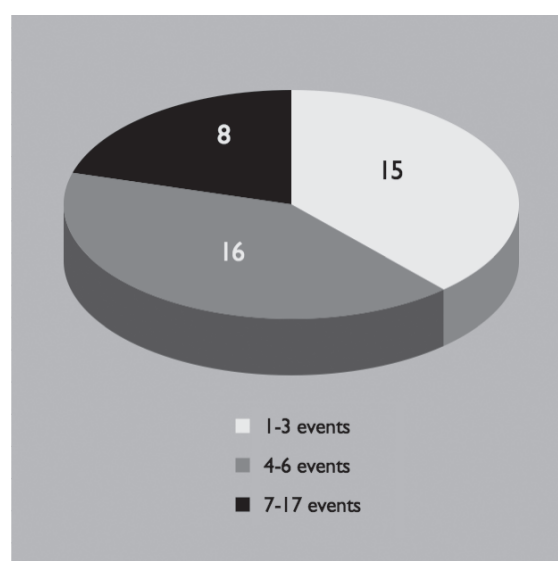
^a Each event may have more than one type of party assessed to lose from the event.

10. SITUATIONS AND EVENTS

10.1 Number of events per situation

The 195 events identified during the inventory are associated with 39 water-related situations. The number of events per situation ranges from one to 17. Among the 39 registered situations, 15 situations consist of only one to three events, 16 consist of four to six events and eight situations consist of between seven and 17 events. The situations are constituted by conflictive or cooperative events (Figure 26).

Figure 26. Number of events per situation

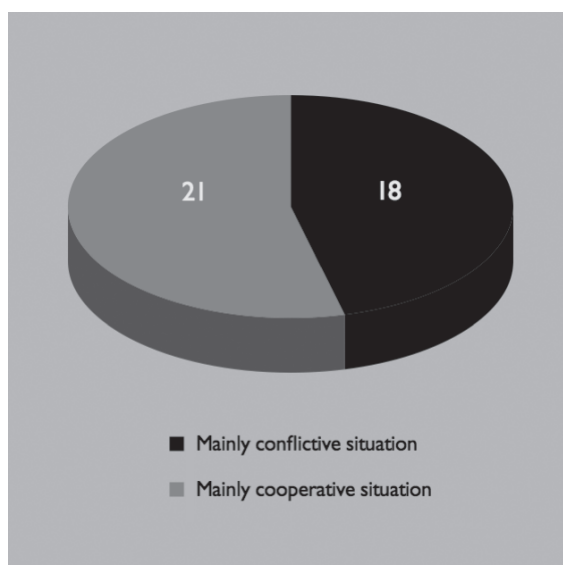


10.2 Character of situation

In general, there are more cooperative situations (21) than conflictive situations (18), i.e. the mainly cooperative situations constitute 54% while the mainly conflictive constitute 46% of the water-related situations (Figure 27).

Figure 27. Overall character of water-related situation

Number of situations



10.3 Current status of water situation

Among the 18 mainly conflictive water situations, six have been settled and agreements are kept, five situations have been settled but agreements are regularly violated, three are under negotiation, and four are still on-going at similar intensity.

Among the 20 mainly cooperative water situations, there are 15 situations assessed to be on-going at similar/steady intensity, in four situations cooperation is strengthening, and in one situation cooperation is weakening.

The five situations in which agreements are violated are very complex situations in

which competition for water resources interfere with political, ethnic and land issues.

This overview of the current status of water situations shows the necessity to reinforce social dialogue in order to minimize negative factors that are hindrances to the development of cooperation.

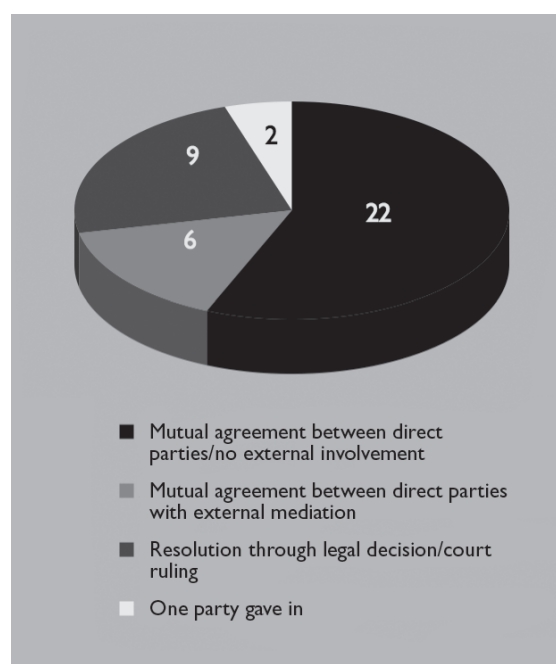
10.4 Mechanism used as part of situation

During the inventory, four types of settlement were identified (Figure 28):

- *One party gave in*: applies in two situations
- *Resolution through legal judiciary decision*: applies in nine situations
- *Mutual agreement between direct parties with external mediation*: applies six situations
- *Mutual agreement between direct parties (without an external involvement)*: applies in 22 situations

Figure 28. Mechanism of settlement

Number of situations



From this overview, it appears that judiciary (legal) settlement is the most frequently used mechanism. Indeed, in a situation of legal and institutional pluralism, parties in conflict go to the institution they think best can protect their right. When all other mechanisms fail, they address the state institutions. But in many cases, legal settlement does not settle the conflict definitively. Most of the time, a legal decision is contested by the loser who continues to act as if nothing has changed, despite the legal process. Most of the situations where settlement is regularly violated are those who have had a judiciary settlement.

Mutual agreement without external involvement happens only in cooperative situations. For such settlements, particularly when the cooperation aims to resolve a common problem, there is no need for external intervention.

Among the conflictive situations, there is only one situation which has been settled directly by parties without involvement of external actors. This situation might be a situation in which the events are of low intensity resolved through internal mechanisms of settlement.

II. CONCLUSION

The inventory of water-related events and situations bring to light several features of conflict and cooperation of in local water governance which provide suggestions for recommendations for policy makers and donors, on the one hand, and for further research, on the other hand.

First at all, the inventory confirmed that in the district of Douentza, they are more unreported than reported events. This indicates that most conflicts are not well known outside their location and underlines the neces-

sity to elaborate a model for following and understanding water conflicts for local and regional authorities.

The inventory provided elements for understanding the nature and character of water-related events and situations, their spatial and temporal distribution.

In Douentza district, more cooperative than conflictive events were identified. Of the 195 water events identified, 87 were conflictive and 108 cooperative. On top of this, in many places, people cooperative on a daily basis and over time to manage wells and other water sources.

There is evidence of a relation between conflict predominance, agro-ecological and hydrological factors, but it also underlines that these factors alone cannot explain a conflictive situation and may not even appear as the most important. Conflictive events are concentrated in zones characterized by water scarcity (e.g. Hombori) as well as in zones with abundant water resources (e.g. the Lacustrian zone). In both zones, management issues appear to be the most determinant factor for the presence of water conflicts. In the zone where people were able to elaborate shared, accepted and well-known rules, conflicts are less frequent, even in cases of water scarcity. For example, in the case of Dioni, a village situated on the plateau, people walk six kilometres outside the village in search for water and still there is no conflict.

Elaboration and implementation of management rules are constrained by internal competition inside the communities, among original inhabitants, and between these original inhabitants and so-called *allochtones* (foreigners or new-comers) and are often part of political struggles. In many cases, water is at stake more as the occasion and less as the direct issue of the struggles and competition.

The data treatment shows that of the 195 events identified, 134 are identified within single communities (intra community), while 60 events happens within two or more communities (inter community). Only one event happens within two or more district.

In terms of temporal consideration, the inventory has established that about three quarters of the water-related events take place in the dry season; only one quarter of the events occurred in the rainy season. This situation is related to the fact that during the rainy season there is less at stake in regard to water resources because there are relatively sufficient water sources. However, the seasonal mobility of herds from the flooded Inner Delta and the presence of transhumant herders can give reason to the relatively small number of intra-communal conflicts and cooperative events during the rainy season.

Most events have taken place rather recently. That is linked to several factors among which the recent decentralization process and the growth of water infrastructure construction are important. At the same time people tend to remember more recent events better.

During the survey, six main water uses were identified: drinking water for animals, drinking water for humans, fishing, fish farming, irrigation and other consumptive uses (non-drinking water). The data analysis confirms the importance of the pastoralist vocation in Douentza district. Indeed, among the 195 registered events, drinking water for animals was related to 137 events (i.e. 70%). This use is followed by rural drinking water supply which was related to 75 events (i.e. 38%).

In Douentza district, inter-uses events are more numerous than the intra-uses events (99 against 89); that is due to the predominance of the two above-mentioned uses.

In the identified conflictive events, the most frequent issues are contestation of rules

(63), water scarcity (48) and competing claims of access for consumptive use (19). The most common issue related to cooperative events is the need for rural drinking water supply (50 events). This reveals that rural drinking water supply is a serious problem and people try to join efforts in order to find common solutions.

The data analysis also brought to light the fact that in a water situation there are issues which do not deal directly with water events. That underlines the necessity to engage in in-depth field studies. It also underlines the necessity to study water events in a broader context and in a longer time perspective, in order to have a thorough understanding of water-related conflict and cooperation.

Surface and ground water resources constitute important water sources for different activities in Mali, and also in Douentza district, natural sources of water supply are predominant. Among these, natural ponds and ground water are predominant related to respectively 65 and 83 events out of the 195 events identified. Concerning the river source, 17 events have been identified. The predominance of events concerning natural water sources may be explained by the fact that modern urban infrastructures are less developed in the Douentza district, in particular in the rural villages.

Parties directly involved in water-related events are mostly water users (e.g. domestic water consumers, irrigation farmers, livestock keepers) and authorities in charge of water management as well as infrastructure development at different levels.

The number of persons directly involved in the events is relatively low. Regarding the gender aspect of involvement, it appears that men are more actively involved in 86% of the identified events. In only 9% of the events, men and women are equally actively involved,

while women are actively involved in about 5% the events.

Public meetings held (52), public oral disagreements (39), private meetings between parties (39) and public oral agreements (32) are the most numerous types of actions taken in the events.

The references used by parties to support their claims or access to water are diverse. Among them, the reference to urgent and critical need for water occupies the first place (52). This reference is followed by the reference to first use/appropriation right to water (36) and reference to customary right to water (26). Those three references constitute more than two-thirds (73%) of all references. Other references in the events concern land-ownership-based rights to water (18), other arguments referred to by the claimants (12), ancestral right to water (5), etc.

Third parties are involved in several events. That happens in both conflictive and cooperative events. The stakeholders, who called upon third parties, are mostly village headmen and community elected leaders. Third parties called upon are in general institutional actors (local level authorities, municipal, district or departmental authorities).

The inventory suggests that events have different impacts for different parties. Registered water-related events have more positive than negative effects. That is due to the fact that even if conflicts are more dominant than cooperative, they can sometimes lead to good results and thus contain a democratic potential, in particular when their intensity is small-scale.

Within the inventory, 39 water-related situations were identified. The number of events per situation range from one to 17. Among the 39 registered situations, 15 situations consist of only one to three events, 16 situations consist of four to six events, and eight situa-

tions consist of seven to 17 events. The situations are constituted by conflictive or cooperative events or both.

Among the 18 mainly conflictive water situations, five have been settled and agreements are kept. Another five situations have been settled but agreements are regularly violated, three situations are under negotiation and five situations are still ongoing at similar intensity.

Among the 21 mainly cooperative water situations, 16 ongoing at similar/steady intensity and in five situations, cooperation is strengthening.

During the inventory four types of settlement were identified:

- *One party gave in*: present in two situations
- *Resolution through legal judiciary decision*: nine situations
- *Mutual agreement between direct parties with external mediation*: six situations
- *Mutual agreement between direct parties (without an external involvement)*: 22 situations

Resolution through legal decision is the most used mechanism of conflict settlement. But this mode does not necessarily conduct to definitive settlement of conflicts.

It would be of great interest for our further work to investigate how and why some situations have been settled and why agreements are regularly being violated.

NOTES

- ¹ The 1950s were unusually good years in terms of rainfall. The years 1973 and 1984 were extremely dry years, and had a very strong negative impact on the hydrology of study area by profoundly modifying the water resource regime. This had catastrophic consequences for the population, which then suffered from a lack of sufficient pastures and crop failure. 1988, 1989, and 1991 were relatively good years, in terms of rainfall (Diarra, 2008).
- ² SICMA is a database related to hydraulic infrastructure (in particular modern ponds and water supply) in Mali, available at the national hydraulic office.

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