



**Conflict and cooperation in local
water governance – inventory of local
water-related events in Con Cuong District,
Nghe An Province, Vietnam**

Yen Thi Bich Nguyen, Phuong Thi Thanh Le,
Huong Thi Mai Pham and Thomas Skielboe

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YEN THI BICH NGUYEN

Lecturer at Center for Agricultural Research and Ecological Studies (CARES), Hanoi Agricultural University, Vietnam.

**PHUONG THI THANH LE and
HUONG THI MAI PHAM**

Researchers with Center for Agricultural Research and Ecological Studies (CARES), Hanoi Agricultural University, Vietnam.

THOMAS SKIELBOE

Social Anthropologist, Nordeco, Copenhagen, 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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- Djiré, Moussa, Abdoulaye O. Cissé, Signe Marie Cold-Ravnkilde, Amadou Keita and Anna Traoré: Conflict and cooperation in local water governance – inventory of local water-related events in Douentza District, Mali. DIIS Working Paper 12/2010. Copenhagen: Danish Institute for International Studies.
- Rivas Hermann, Roberto, Tania Paz Mena, Ligia Gómez and Helle Munk Ravnborg: Cooperación y Conflicto en torno a la Gestión Local del Agua en el municipio de Condega, Nicaragua. DIIS Working Paper 13/2010. 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 Con Cuong District, Nghe An Province, Vietnam, and discusses the implications.



Images from Con Cuong District, Nghe An Province, Vietnam

ABBREVIATIONS

CPC	Commune People's Committee
DONRE	Provincial Department of Natural Resources and Environment
DPC	District People's Committee
GFPWS	Gravity Fed Piped Water System
MONRE	Ministry of Natural Resources and Environment
NGOs	Non Governmental Organizations
PPC	Provincial People's Committee
WSC	Water Supply Company
WRSS	Water Rural Supply and Sanitation

I. INTRODUCTION

Water plays a central role for local livelihood and local development. In many parts of the developing world, the competition for water has increased over the last years due to the appearance of new types and structures of water uses and water users, growing population rates, increased pressure on land as well as rapid climate change.

Competition for water may lead to both conflicts and cooperation between water consumers. There have been many studies focusing on water conflicts at large scale, such as transboundary water conflicts, while local water conflicts are not very well documented. Therefore, a three year collaborative and comparative *Competing for Water research program* supported by the Danish Research Council has been carried out since 2007. The 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.

In order to understand the nature, extent and intensity of water-related conflict and cooperation, one of the principal objective of the program is to develop inventories of water-related conflictive and cooperative water events which have occurred since 1995 in five districts in five different countries, namely (1) Tiraque district in Bolivia; (2) Douentza district in Mali; (3) Condega district in Nicaragua; (4) Con Cuong district, Nghe An province in Vietnam; and (5) Namwala district in Zambia.

The inventory provides an overall assessment water-related events to identify factors associated with local water-related conflict and cooperation and thus help to establish the causal relationship between competition for water and water-related conflict and cooperation. It further provides the basis for household surveys that link poverty and water access and in-depth case studies with narratives of selected conflictive and cooperative events to clarify the impact of water-related conflict and cooperation for the poor and for women, and to understand the role of formal and informal institutions in *de facto* conflict and cooperation processes.

This report presents results of the inventory of water-related conflictive and cooperative events and situations for the period of ten years in Con Cuong district, Nghe An province in Vietnam.

2. METHODOLOGY

2.1 Definitions

2.1.1 Water event and situation

The following water event and situation definitions and explanations are extracted from project methodology guides which were developed by the Competing for Water research team in October 2007.

A water event is an action (or a set of actions) that seeks to secure one or more parties' access to water by (i) challenging other parties' access; (ii) confirming own or other parties' access; or (iii) collaborating with other parties to secure access.

Water events may stand alone or relate to each other forming a water situation.

A *water situation* is a social situation where two or more parties have competing interests in the same water resource. The competition takes place through water events. Water situations may be 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.

...tive aspects, and the local resource management practices. The relationship between water event and water situation is presented in Figure 1.

2.1.2 Conflict and cooperation

Conflictive and cooperative situation

Competition occurs when *more parties* have *different interests* in the *same water resource*. Competitive water situations can be characterized as ‘mainly cooperative’, ‘mainly conflictive’ or an equal mix of both (Competing for Water research team, October 2007)

Water conflict and cooperation takes places within a particular national and local context (i.e. the ‘setting’), which includes the local and wider physical and hydrological regime, the socio-economic, cultural and political setting, the various policies and legal and administra-

- Water situations may be cooperative when parties manage to negotiate and/or sustain agreements for water use.
- Water situations may be conflictive when water access and use of one or more parties is contested.

Figure 1. Relationship between water event and water situation

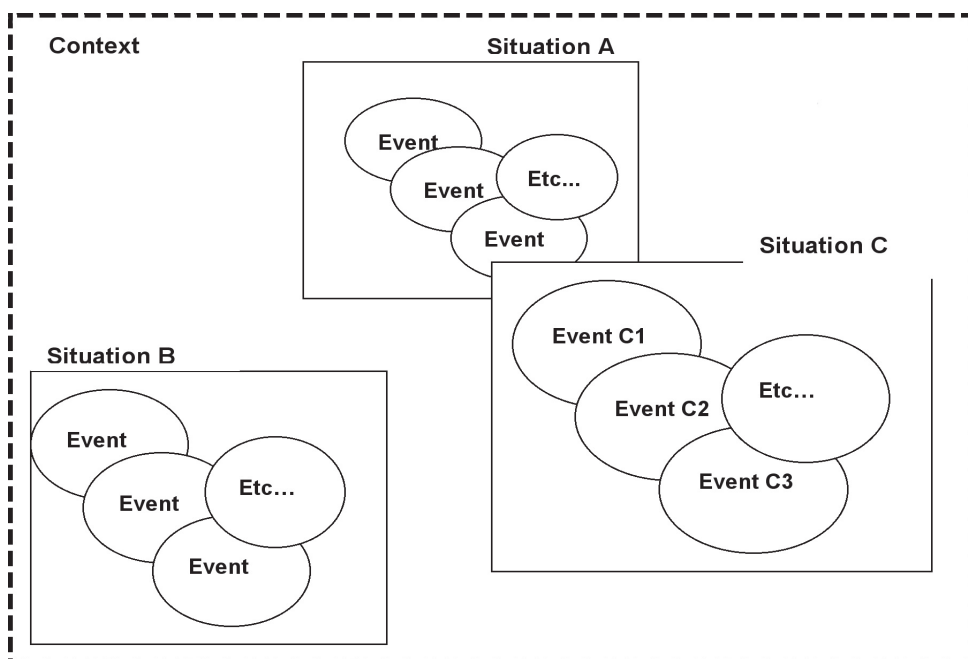


Table 1. Local-level water-related event intensity scale

<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 organises 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 the access rights of others	-2	A party brings 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 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 organisational 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
Merge formerly individual access rights	7	Parties with previously separate cattle watering points decide to allow each other mutual access rights

Conflictive and cooperative events

The Competing for Water Program (2007) defines event character as:

An event is *conflictive* if one or more parties challenge other actors' access to a particular water resource. This may range from

- petty water 'theft' (according to formal law, customs, etc.), through
- excessive water use (depletion or contamination), to
- open violence and aggression or physical inhibition of others' water access.

The 'challenge' may concern the amount of water being withdrawn, the quality of water left available for others, the location of water, 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 or to acknowledge other parties' access to water. This may range from

- verbal acknowledgement of the rights of others, to
- joint water management mechanisms.

2.1.3 Event intensity

In order to assess water event intensity at local level, the Competing for Water Program has developed a scale presented in Table 1, according to which the intensities can be categorized into 14 degrees ranging from mild to strong conflict (negative numbers) or cooperation (positive numbers).

2.1.4 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* 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, water events that take place at a smaller scale, e.g. between a couple of neighbours or between husband and wife, are considered as *private*. In the scope of our study, only public water events are recorded as part of the water event inventory.

2.1.5 Reported and unreported water event

Water-related conflictive or cooperative events can be a reported or unreported event. 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 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 event and at the location of the events, the events will belong to the category of 'reported and unreported' water events.

2.2 Sampling strategy**2.2.1 Site selection**

Nghe An province was selected as a study site in Vietnam by the Competing for Water research team based on research location sampling criteria (Box 1) as well as the experience availability from previous research funded by Danida (Competing for Water research team, November 2007).

Nghe An province is relatively large in both area and population (16,487 km² and

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)

2.9 million people) compared to the study sites of the other countries involved in the project. Therefore the Vietnamese research team decided to narrow down the study area by selecting Con Cuong district, which is relatively representative for the province, as our study site, based on most of the criteria given in Table 1 and suggestions from key provincial consultants working in the water sector. In addition, geographical conditions and ethnic composition were also taken into account.

2.2.2 Community selection

Ten communities were selected to identify unreported water events (Table 2). Con Cuong district has 128 hamlets located within 13 communes (Figure 2). In order to ensure a geographical distribution, the communities were geographically stratified based on commune boundaries. The number of hamlets to be selected from each stratum (commune) was determined by weighting its share of the total population of the district. After that, the indicated number of hamlets was randomly selected from each stratum.

2.2.3 Informant selection

In order to collect all water-related conflictive and cooperative events which have taken place since 1995 in each of the selected communities, both key informants and ordinary inhabitants were interviewed.

In our study, we understand key informants and ordinary inhabitants as follows:

- Key informants are persons who besides being inhabitants of the community are persons who take up formal positions in community-level institutions.
- Ordinary inhabitants are persons who live in the community but do not take up any formal positions in community-level institutions.

In the case of Con Cuong district, key informants include persons who hold formal positions in community government, including community leader/vice leader, community communist party secretary and heads of rural community organizations, including drinking water committee, irrigation committee, women association, farmer association, youth association, elderly people association, and veteran association. Some teachers are also involved.

Before carrying out informant interviews, we first interviewed the community leader to get an overall picture of the community in terms of the socio-economic conditions, population, water sources, water type, etc. Then, we asked him/her to invite the above-mentioned key informants to join our discussion. We worked with focus group discussions. All the participants were encouraged to openly participate in the discussion. Further, based on our first discussion with the community leader, and focus group discussion with village government and head of community organizations, some other informants were also identified.

Table 2 . Community sample description, Con Cuong district, Vietnam

Sampling stratum, number of hamlets, population and ideal number of hamlets to be selected, selected hamlets and population in selected hamlets, per sampling strata.

<i>Communes (sampling stratum)</i>	<i>Number of hamlets</i>	<i>Total households (2007) and share of total (%)</i>	<i>Ideal number of hamlets to be selected</i>	<i>Selected hamlets</i>	<i>Households in selected hamlet (2007)</i>
Bình Chuẩn*	8	755 (5%)	0.5	Bản Quế	70
Đôn Phục*	9	710 (5%)	0.5		
Cam Lâm**	5	503 (3%)	0.3	Đười	134
Mậu Đức**	9	1,047 (7%)	0.7		
Thạch Ngàn***	13	1,083 (7%)	0.7	Xóm Mới	30
Lạng Khê***	7	935 (6%)	0.6		
Chi Khê	12	1,342 (9%)	0.9	Bản Chai	138
Thị Trấn	9	1,295 (9%)	0.9	Khối 3	119
Bồng Khê	12	1,349 (9%)	0.9	Thanh Đào	116
Yên Khê	9	1,122 (8%)	0.8	Trung Hương	164
Châu Khê	11	1,184 (8%)	0.8	Bãi Gạo	70
Lục Dạ	11	1,561 (11%)	1.1	Bản Mọi	138
Môn Sơn	13	1,808 (12%)	1.2	Tân Sơn	166

* The hamlets of the communes Bình Chuẩn and Đôn Phục were merged into one stratum from which one hamlet was randomly selected.

** The hamlets of the communes Cam Lâm and Mậu Đức were merged into one stratum from which one hamlet was randomly selected.

*** The hamlets of the communes Thạch Ngàn and Lạng Khê were merged into one stratum from which one hamlet was randomly selected.

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) and
- pastoralists, fishers, farmers as well as other types of users (crop processing, brewing, etc.)

While all key informants 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. The number of ordinary inhabitants selected for interviewing was different among the selected communities, depending on the complex level of each community which depends on the diversity of geographical conditions, water sources and water use types.

Table 3. Summary of issues included in registration format for water events and situations

Identification & location	<ul style="list-style-type: none"> ▪ Short narrative summary ▪ Event/situation location
Users, uses, issues, timing and action	<ul style="list-style-type: none"> ▪ Uses involved in the event ▪ Issue (e.g. quantity, quality, privatization, infrastructure, etc) ▪ Direct parties involved in the event ▪ Timing ▪ Actions taken ▪ Character
Water source	<ul style="list-style-type: none"> ▪ Type of water source involved in the event ▪ Water availability
Third party involvement	<ul style="list-style-type: none"> ▪ Type of third party involved ▪ Process of the involvement
Magnitude	<ul style="list-style-type: none"> ▪ Number of people directly involved in the event ▪ Relative involvement of women and men ▪ Number of people affected by the event ▪ Relative importance of women and men affected by the event
Intensity and outcome	<ul style="list-style-type: none"> ▪ Intensity of the event ▪ Winners and losers
Information sources	<ul style="list-style-type: none"> ▪ Sources of information for the event

2.3 Brief overview of event and situation formats

All information related to water situations and events was recorded as notes during the interviews. In order to analyze collected information to understand the nature, extent and intensity of the water events in the whole Con Cuong district, information of events and situations in the notes was later registered into a format developed by the Competing for Water program.

The formats cover all related issues of an event or a situation in eight sections. The first section provides a short description of an

event/situation (i.e. shortly describe parties, water resource, access issues, nature, contents and setting of actions taken, and response of parties). Section 2 mentions event/situation location (i.e. the basin, the watershed where the event/situation took place), and the event/situation distribution (i.e. whether an event/situation took place within one single community or within two or more communities/districts). Water use types, event issues, direct parties involved in, actions taken in the event, event character (i.e. cooperative, conflictive or neutral), water sources (i.e. spring, stream or river, etc.) and water source

infrastructure (i.e. tank, well, dam, etc.), and water source ownership (i.e. the water is private owned or public owned) are reviewed in section 3 and section 4. The involvement of the third party (i.e. who called upon the third party, who was called upon as third party) is registered in section 5. Section 6 registers the numbers of people, the estimated share of women and men involved in and affected by the event to underline the magnitude on which the event has impact particularly to underscore the water users' involvement by gender. Section 7 provides information about event intensity, the researcher's assessment on conflictive and cooperative intensity, and the outcome of an event and situation (i.e. who won/affected/benefited or lost in an event/situation). Finally, information sources (e.g. institutions, water-related agencies, officials, mass media at different levels, etc.) through which an event/situation is identified are registered in section 8. Table 3 provides a summary of issues included in the registration format for water events and situations.

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 Con Cuong district, we conducted interviews/meetings with representatives of relevant authorities from commune to national level. These include representatives from Institute of Water Resources and Planning, Ministry of Natural Resources and Environment (MONRE), Provincial Departments of Natural Resources and Environment (DONRE), and Departments under District People's Committee, such as Departments of Natural Resources and Environment, of Agriculture and Rural Development, of Infra-

structure and Economy, of Land Administration, of Forest Protection. Chairman and/or Vice Chairman of communes and heads of communal organizations are the important sources for reported events. Two companies in the district, namely Water Supply Company and Company of Paper Powder Processing, are identified as the source of a number of events.

In each interview, the respondents were asked to create a table to list all main water sources, water uses, water users, difficulties and problems challenging water users in each type of water use in Con Cuong district. Based on the table, the respondents were able to brainstorm water events which had occurred since 1995 in each water source. These interviews enabled us to obtain not only a list of reported events but also other potential sources where detailed information on the listed-reported events or new reported events could be found. Subsequently, information search for reported events was conducted at all possible sources suggested through the above-mentioned interviews.

The number of events provided by each of the consulted sources is shown in Figure 2. Among sources consulted for event identification, representatives from MONRE, DONRE, water agency, i.e. Water Supply Company, municipal council representatives, i.e. representatives from District Departments of Natural Resources and Environment, of Agriculture and Rural Development, and of Infrastructure and Economy, and commune representatives, i.e. Chairman and/or Vice Chairman of communes and heads of communal organizations are important sources that provided a number of events and situations. Thus, commune representatives were the source of the highest number of events, namely 27 cooperative and 17 conflictive events, followed by municipal council rep-

representatives with 23 cooperative and 5 conflictive events. A large number of events, especially cooperative events, were identified through these sources, mainly about water work infrastructure development in the communes, for instance dam construction and upgrading, gravity-fed piped water and well constructions, etc. Some events are about contamination caused by gold mining. Events about this issue are also identified through the internet. Water authority and municipal environmental council mentioned an equal number of events with 9 and 10 events respectively. They are mainly about water pollution caused by waste discharged from a paper powder processing company and a big restaurant. Some events are about complaints on water fee for fresh tap water which is supplied by Water Supply Company.

2.4.2 Unreported events

Unreported events were identified through interviews with community members and other actors at the location of events. The selection of informants for the interviews has already been described in section 2.2.3.

In each of the selected hamlets, a sketch map of existing water sources (rivers, springs, ponds, lakes, dams, canals, etc.) was first developed by the community leader. This map was subsequently used as the starting point for brainstorming with informants about events which have taken place with respect to each of these water sources during the last 10 years. We found that it was easy for key informants to draw out events using the map of water sources as the starting point for their brainstorming. All the participants were encouraged to join the interview.

Figure 2. Information sources for reported events by character
Number of events

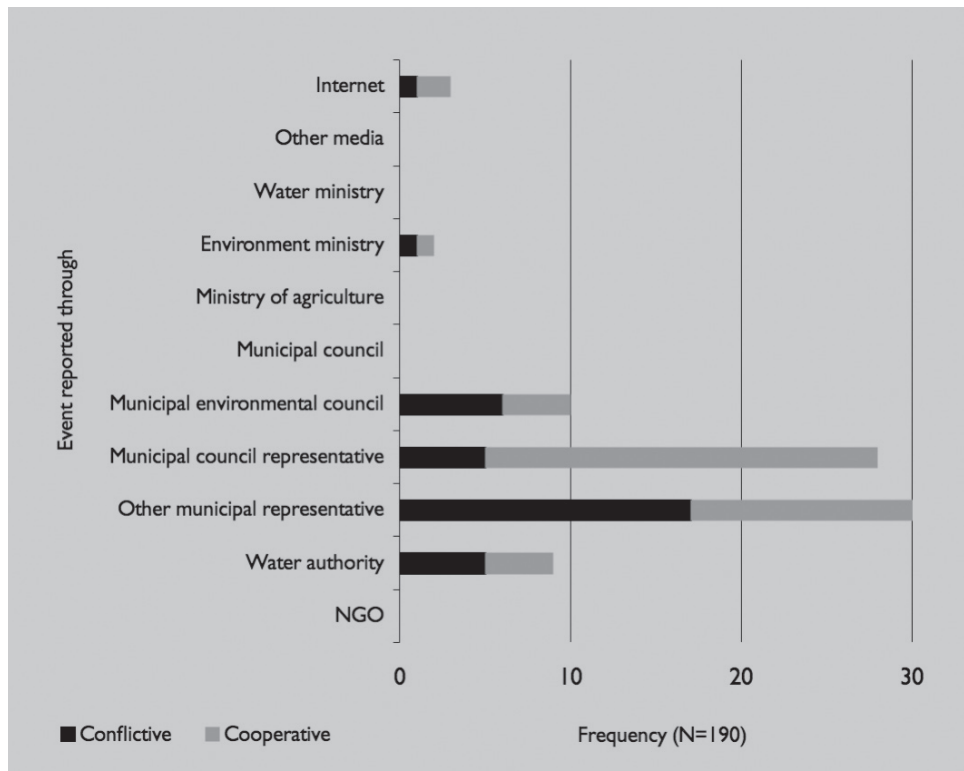


Figure 3. Information sources for unreported events by character

Number of events

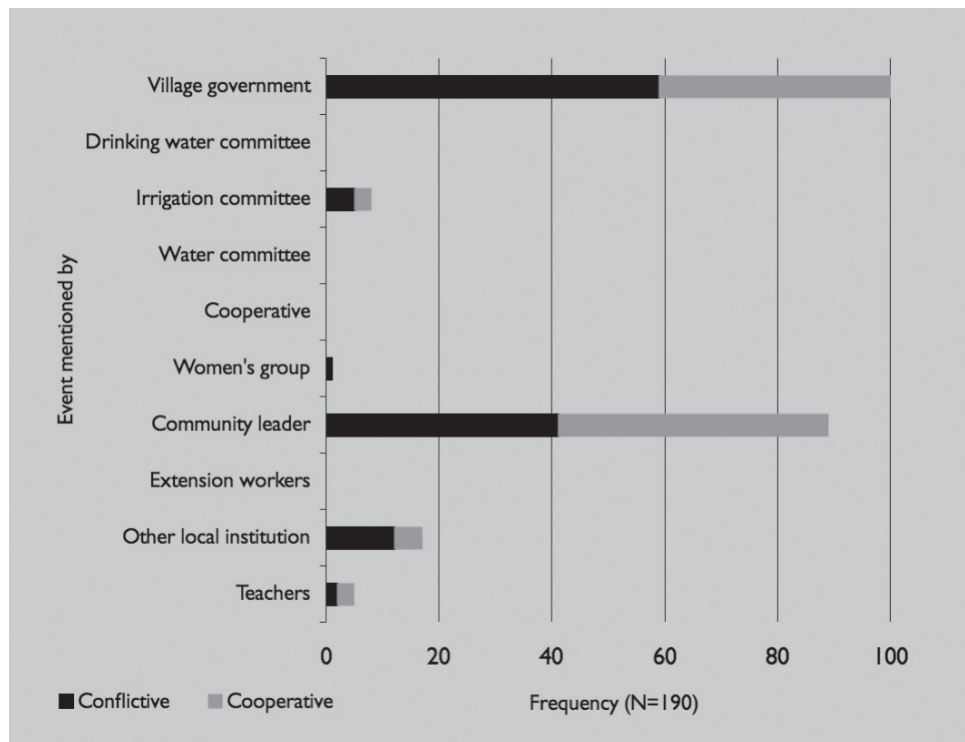
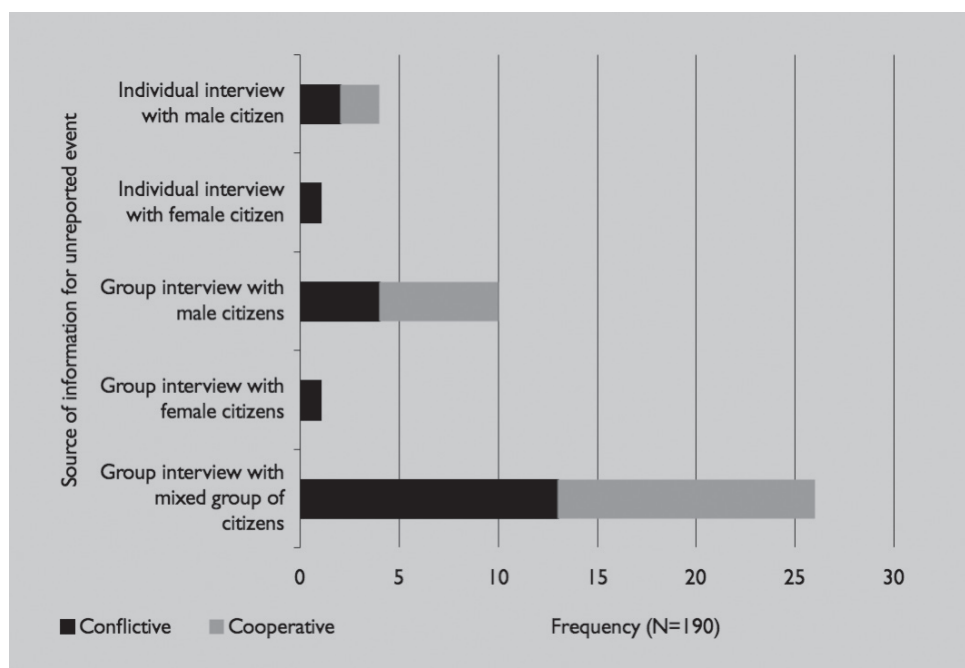


Figure 4. Number of events provided by ordinary people by character

Number of events



As we found that informants were uncomfortable to talk of ‘conflicts’, we used other words to refer to conflicts such as ‘difficulties’ or ‘problems’. Character of the events was not directly mentioned by informants but identified later by the researchers themselves based on information about the event and the definitions of conflictive and cooperative events mentioned in section 2.1.2.

The sources through which a large number of events and situations were identified are shown in Figure 3. Through community organizations, including the irrigation committee, women association, farmer association, youth association, elderly people association, and veteran association, a total of 73 cooperative events and 59 conflict events¹ were identified, while through interviews with community leaders a total of 48 cooperative and 41 conflictive events, respectively. Irrigation committee and teachers are the sources of a total of eight and four events, respectively. Other local institutions provided 17 events, of which 12 were cooperative and five were conflictive. These ‘other local institutions’ include vice community leaders, former community leaders and community communist party secretaries.

A total of 42 events were mentioned by ordinary citizens, i.e. persons living in the community but not taking up any formal positions in community-level institutions. 26 events, 13 for each type of event, were identified through group interviews with both men and women. 14 events were identified either through group interviews or individual interviews with male citizens (Figure 4). Group interviews provided more events than others because during the interview the participants could discuss to recall related events.

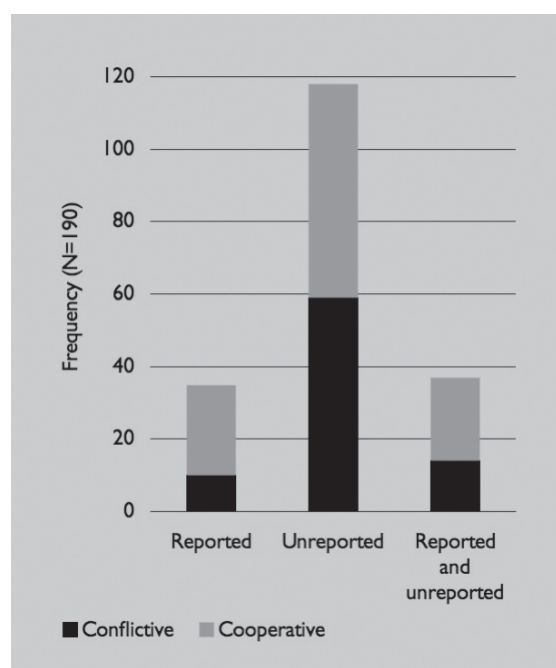
2.5 Ratio of reported and unreported event

We identified a total of 190 events of which 62% (n=118) were identified as unreported events through inventory work in the selected communities, and about a quarter (n=37) were identified from both communities and institutions outside of the location of events (labelled ‘reported and unreported’ in Figure 5). The remaining 17% of the events (n=25) were identified as strictly reported events through interviews with institutions outside of the location of events, such as Commune People’s Committees (CPCs), District People’s Committee (DPC), Water Supply Company (WSC), local media, etc.

56% (n=107) of the identified events are cooperative, while the remaining part (n=83) is conflictive. Of the events reported outside of location of events (both strictly reported and ‘reported and unreported’), the number

Figure 5. Ratio of reported and unreported events by character

Number of events



of cooperative events is more than double of that of conflictive events (59 compared to 25). Of the unreported events, the number of cooperative events balances the number of conflictive events (Figure 5).

The number of unreported events is high which reflects that most events take place on the local scale in the community. In terms of intensity, these events are mainly mild events consisting of verbal agreement or disagreement between involved parties, and if denounced to third parties, denouncements tend to be made to institutions within the community or the rural community government. (This will be discussed more in sections 4.1, 7 and 8.1).

2.6 Possible data biases and limitations

During our work, we registered the following biases and limitations in data collection and registration:

In term of event registration, inconsistency in identifying the events and other related aspects (e.g. the intensity, share of affected people) may occur due to the subjective and qualitative event and situation identification. For example, the assessment of the event intensity may to a certain extent depend on the person undertaking the assessment. To minimize such inconsistency, discussion and deep analysis of each event were carefully done among the research team members.

With respect to comprehensiveness, although the data collection has been identified through interviews with a variety of key informants from related authorities and community members, event leaking cannot be avoided. In many cases, the informants could not give exact date of the events. For example, the informants sometimes could not

remember the date of events relating to irrigation water which frequently happens during the dry season. They just said that these events actually happened among irrigation farmers. They could not give the exact date and involved actors in the events. Therefore, there is a risk that some events actually taking place could not be reconstructed due to lack of information and have therefore not been registered.

Further, about the type of information sources for the events, i.e. unreported or reported or both, in some cases, the events were registered as 'unreported' rather than 'both reported and unreported', although they should be recorded as 'both reported and unreported'. For instance, though several events which were identified through key informants in the community had their complaints and requests submitted to a third party, e.g. the commune officials, we failed to confirm that information with the commune officials. In some cases, such requests and complaints were not put on file, so it was difficult to trace the track of the events. In addition, such complaints were just verbally reported, so the receivers might not remember provided information. As a result, these events were recorded as 'unreported' only.

3. BRIEF OVERVIEW OF MAIN CHARACTERISTICS OF STUDY AREA

Con Cuong district is one of the mountainous districts of Nghe An sharing boundaries with Tuong Duong district in northwest, Quy Hop and Anh Son districts in the northeast and north, respectively, and Xieng Khouang province of Lao in the northwest (Map 1).

Con Cuong is located in a monsoon climate zone with an average annual rainfall of 1,791 mm. The rain falls from August to September. However, distribution of the rainfall is spatially uneven within the district due to the topographical effect.

Con Cuong is characterized by two seasons, namely cold and dry season, and hot and humid one. The former which is caused by the northeast monsoon lasts from November to March, and the latter which is caused by the southeast monsoon lasts from April to October. The monthly average temperature of the district ranges from 17 °C in January to 29 °C in July.

The main river flowing through the district is the Ca River. However, this river only supplies water for drinking and production for a small part of the population living along the river bank. The other two rivers, Khe Choang and Giang, have high water flow but are only the main water source for two communes, Chau Khe and Mon Son. In addition, springs and streams located at dif-

ferent parts of the district are the main surface water resources providing for people's livelihood in Con Cuong (Map 1). Some features of the main rivers in Con Cuong are given in Table 4.

The district has an area of 1,744 km² with a population of approximately 68,000 and population density of 39 persons per km² in 2007. It is administratively divided into 12 communes and one town (Map 1). These communes and the town are further split into 128 villages/hamlets (Con Cuong DPC 2007). There are four main ethnic groups in the district: *Thai*, *Kinh*, *Dan Lai* and *Hoa Kieu*, of which the *Thai* population makes up 70% of the total population of the district.

The main productive water use in Con Cuong is for irrigation of paddy fields. Water uses for livestock, fisheries and industries are of minor importance, as these activities are not that common in the area.

Some main characteristics of Con Cuong district in relation to water use are presented in Figure 6.

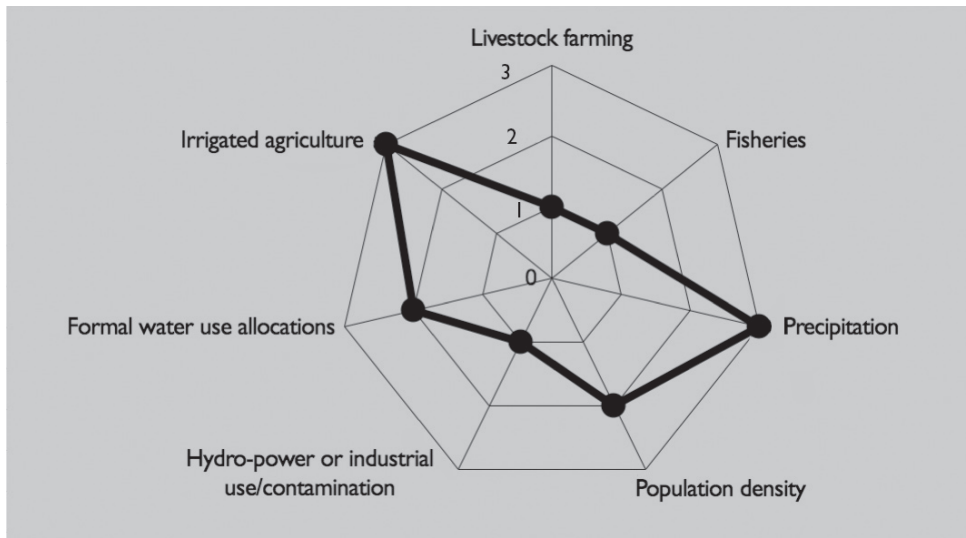
Table 4. Some basic features of the main rivers in Con Cuong

<i>River name</i>	<i>Location of origin</i>		<i>Location of water mouth</i>		<i>Length (km)</i>	<i>Area (km²)</i>	<i>Catchment altitude (m)</i>	<i>Catchment slope (%)</i>
	<i>Latitude</i>	<i>Longitude</i>	<i>Latitude</i>	<i>Longitude</i>				
<i>Ca</i>	20°15'30"	103°15'20"	18°45'50"	105°45'10"	361*	17,730	294	18.3
<i>Khe Choang</i>	18°56'20"	104°34'10"	19°06'30"	104°47'10"	430	431	679	34.1
<i>Giang</i>	18°47'20"	104°52'30"	18°50'10"	105°16'30"	77	1,050	492	17.2

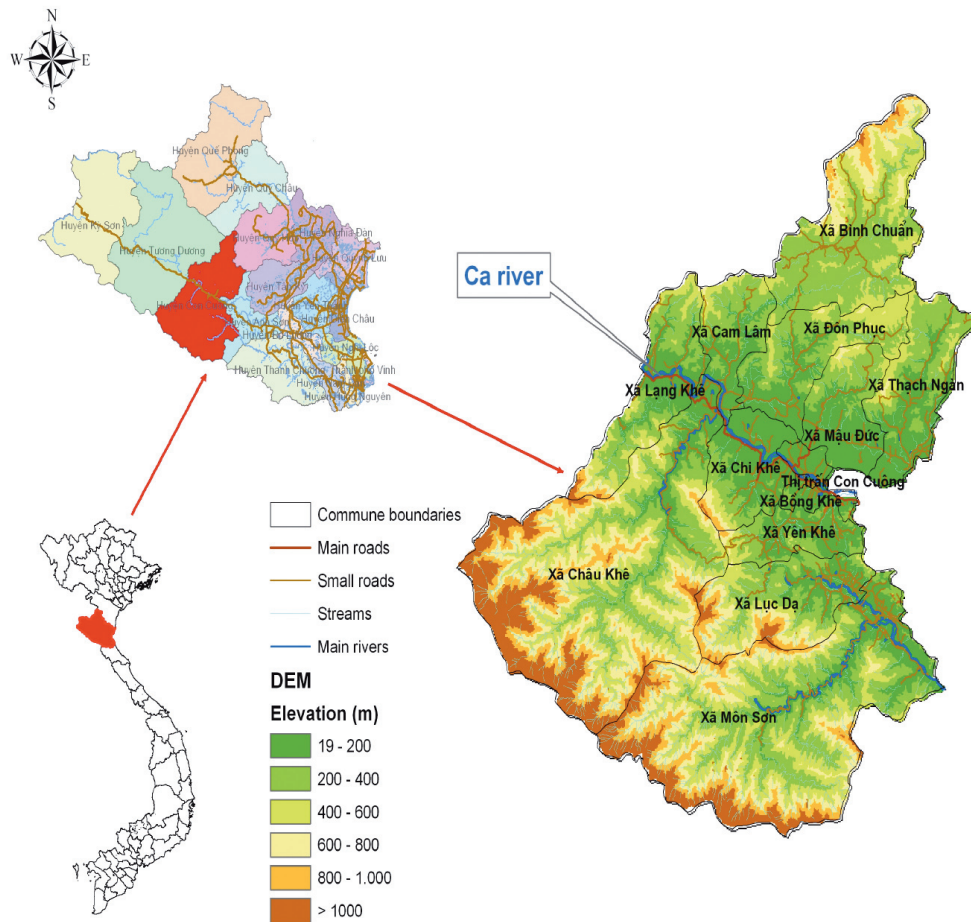
* Length of the river in Vietnam (The Ca river originates in Laos)

Source: (Nguyen 2000)

Figure 6. Main characteristics of Con Cuong in relation to water use



Map 1. Map showing the location of study area – Con Cuong district



Box 3. Water pollution in Diem spring (event 4088)

A paper powder processing factory has been operating in Pha village since 2002. Drainage from the production process which is directly discharged into Diem spring causes pollution of the spring. In 2003 people in Pha hamlet (Yen Khe commune) and Vinh Hoan hamlet (Bong Khe commune) who use water from the spring complained to communal and district authorities about bad water quality.

4. TEMPORAL AND SPECIAL DISTRIBUTION OF EVENTS

4.1 Spatial scale of events

The spatial scale of the events, i.e. whether the event takes place within a single community, within two or more communities or within two or more districts, is determined on the basis of where involved and/or affected people are from. For example, if the affected people belong to two different communities, the spatial scale of the event is indicated as ‘between two communities’. Another example is that if a conflictive event takes place among irrigation farmers from a single community, the spatial scale of the event is indicated as ‘within a single community’.

Almost two thirds of the identified events took place within a single community (Figure 7). This implies that most of the events are mainly related to water use and water works at the local scale. This is natural in a mountainous district like Con Cuong where the communities are often surrounded by mountain ranges.

Figure 7. Spatial scale of conflictive and cooperative water-related events

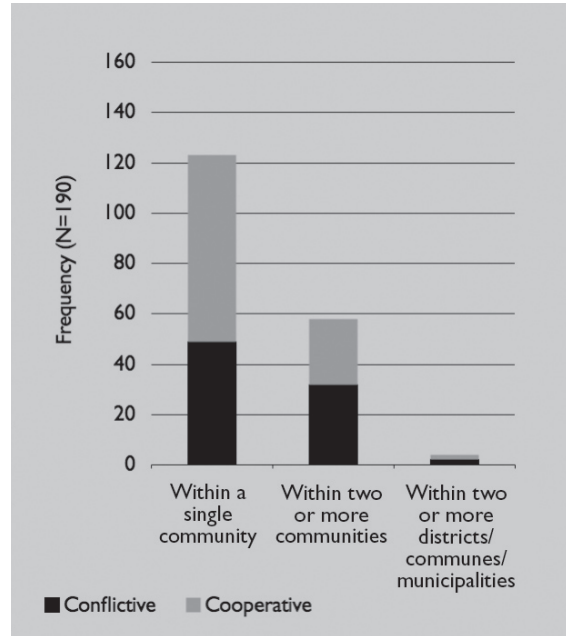
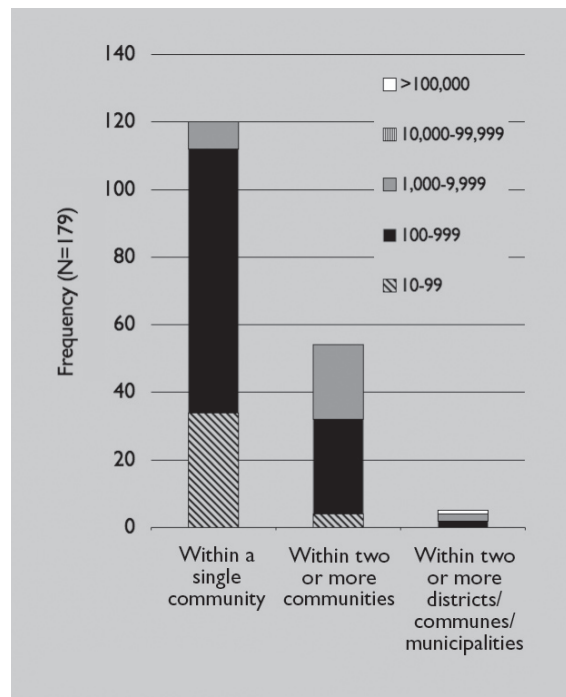


Figure 8. Spatial scale of events with different magnitudes in Con Cuong district

Number of events



Although only one-third of the events occurred at larger spatial scale, either among two or more communities (n=58) or among two or more districts (n=4), such events tend to affect or benefit a larger number of people. For instance, of the events taking place within a single community, only eight events were assessed to benefit or affect between 1,000 and 9,999 persons, while 22 of the events taking place between two or more communities were assessed to affect or benefit this number of people (Figure 8).

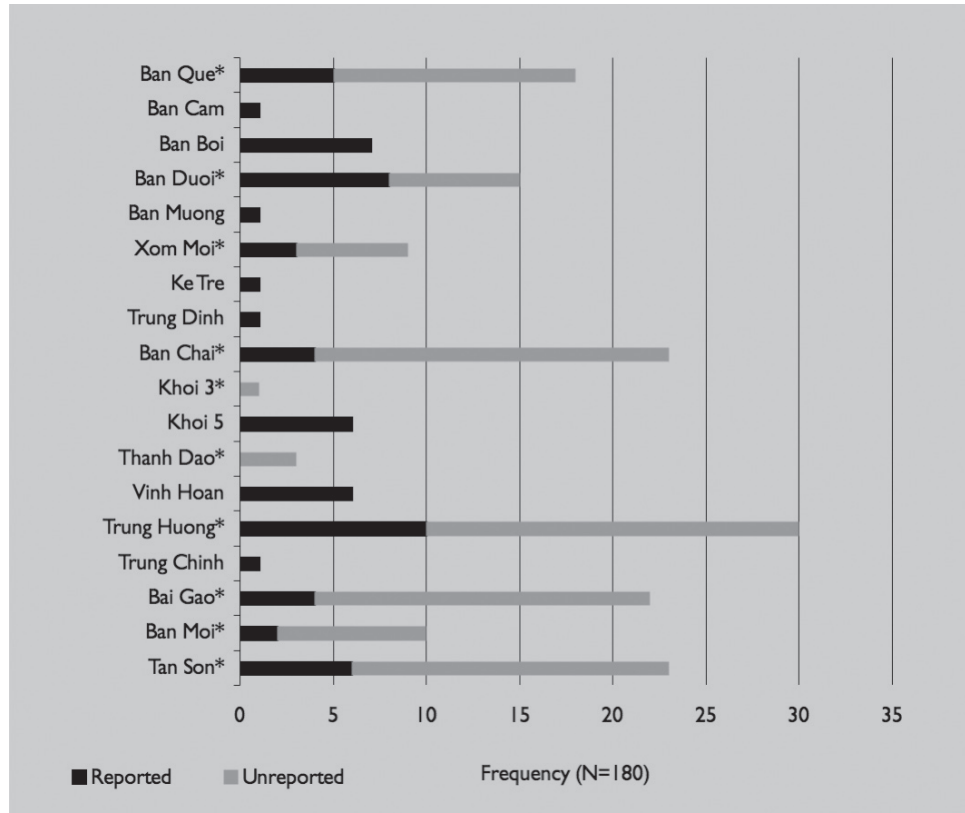
4.2 Spatial distribution of events

Of 190 events identified through our survey, 183 events take place at community level. Distribution of the events among these

communities is presented in Figure 9. The remaining events take place at larger scale, for instance at the whole commune or Con Cuong town. They are, therefore, not included in Figure 9.

It is obvious that more events were found in the sampled communities (indicated by '*' following the community name in Figure 9), except Khoi 3, a community in Con Cuong town, and Thanh Dao which belongs to Bong Khe commune located next to the town. Among these communities, Trung Huong hamlet is a place where there is the highest number of events taking place at (more than 30 events). Bai Gao hamlet is the next with more than 25 events, and Tan Son and Ban Chai are the third with about 13 events. During our survey, we found that the number of

Figure 9. Distribution of events across communities by source of information (*' indicate sampled communities) *Number of events*



events taking place in each community seems to be associated with its development of water infrastructure. This is confirmed in section 7.4 which deals with the importance of infrastructure for water-related conflict and cooperation.

Both conflictive and cooperative events were identified in the selected communities, except in Khoi 3 and Thanh Dao where only cooperative events took place. In contrast, from the eight non-sampled communities from which events were identified as reported events (without '*' in Figure 10), only cooperative events were identified in five of the communities (Trung Chinh, Trung Dinh, Ke Tre, Ban Muong and Ban Cam), while both conflictive and cooperative events took place in the remaining three non-sampled communities.

Map 2. Map showing the distribution of events identified in selected communities in Con Cuong district

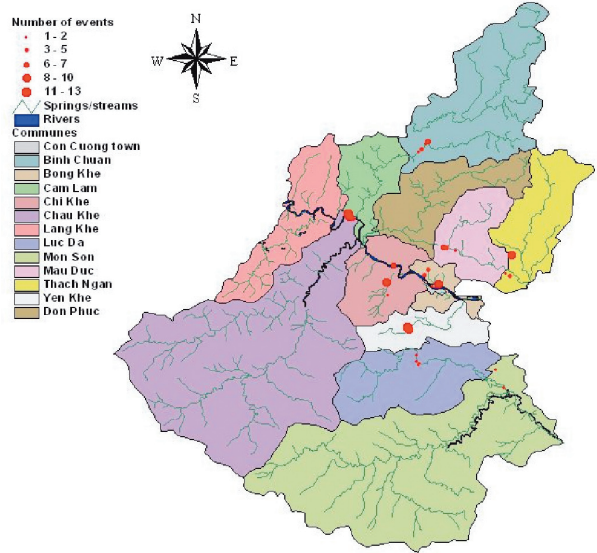
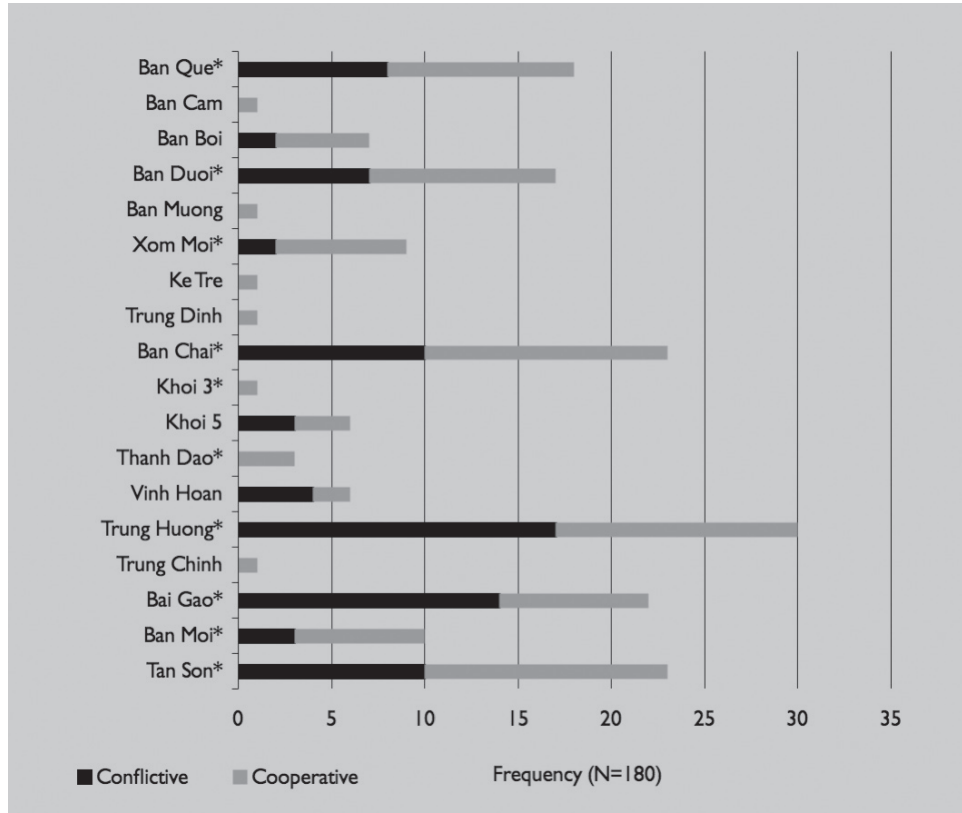


Figure 10. Distribution of events across communities by character (* indicate sampled communities) *Number of events*



Map 2 shows the spatial distribution of events taking place mostly within the 10 sampled communities. It should be noted that there are only 154 events shown up in the map, as we were able to identify their coordinate systems by using a GPS.

4.3 Temporal distribution of events

Our survey result shows that most of events have started recently. 51% (n=96) of the identified events occurred during the periods of 2001-2005 and 23% (n=53) took place between 2006-2008 (Figure 11). These events are mostly related to the infrastructure development. During these periods, an extensive number of infrastructures, including waterworks, have been developed in Con Cuong as well as in other mountainous districts as outputs of the implementation of

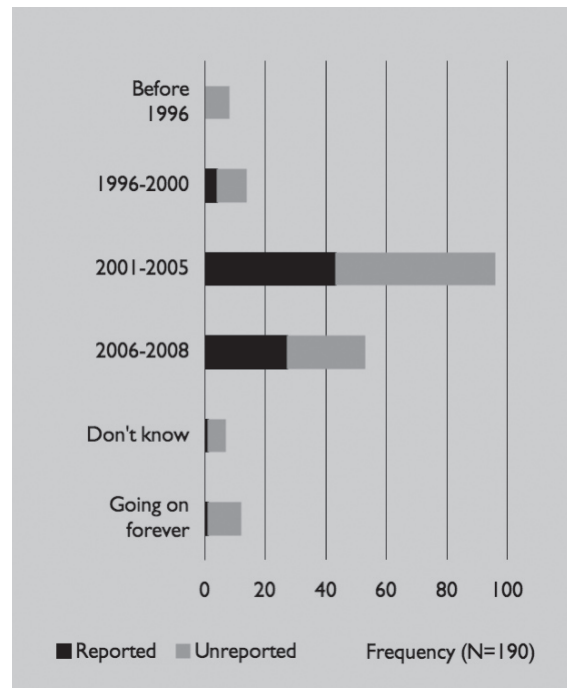
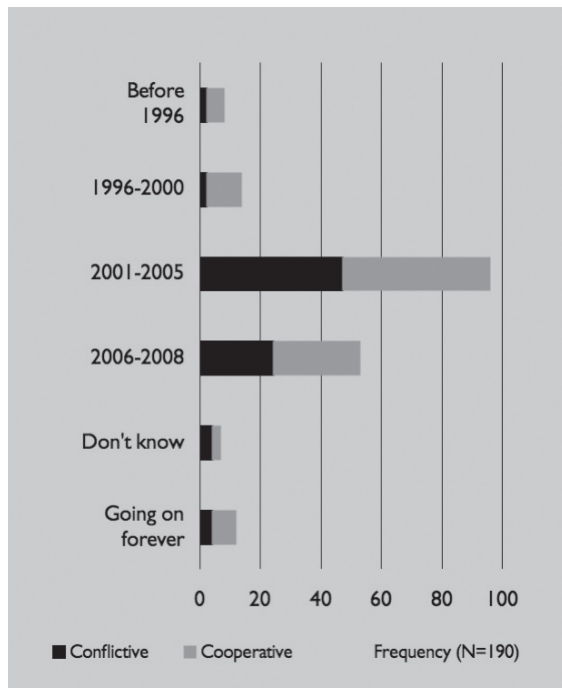
a number of development programs, such as program 134, program 135², and the program of national rural water supply and sanitation. The development of infrastructure may result in the high number of conflictive and cooperative events.

Although constituting a small proportion of the events, it is also interesting to know that there are several events which took their beginning in 1995 or before, and are still going on. These types of events are mostly associated to water use for drinking and irrigation without the involvement of infrastructure.

It is also easy to recognize that the ratio of cooperative events to conflictive events which took place before 2001 is higher than that after 2001. By the source of event, the same trend is also seen in the ratio of reported events to unreported events (Figure 11).

Figure 11. Temporal distribution of events having occurred within the last 10 years by character and source of information

Number of events



4.4 Starting season of events

Although the hydrological study of the program shows that the current water demand for domestic and productive (agriculture and livestock) use, could be satisfactorily met by the existing water sources, water scarcity – especially in the dry season and mainly as a result of uneven distribution – is a main reason for the significant increase in number of events in the dry season, both conflictive and cooperative (Figure 12). It is very interesting to note that the prevalence of conflictive and cooperative events is almost equal in both seasons. Of cooperative events, some of them are involved in establishment of water works such as dam, weir, and water pipe system. The time of construction normally starts in dry season which contributes to high number of cooperative events in dry season.

Figure 12. Starting season of events by character

Number of events

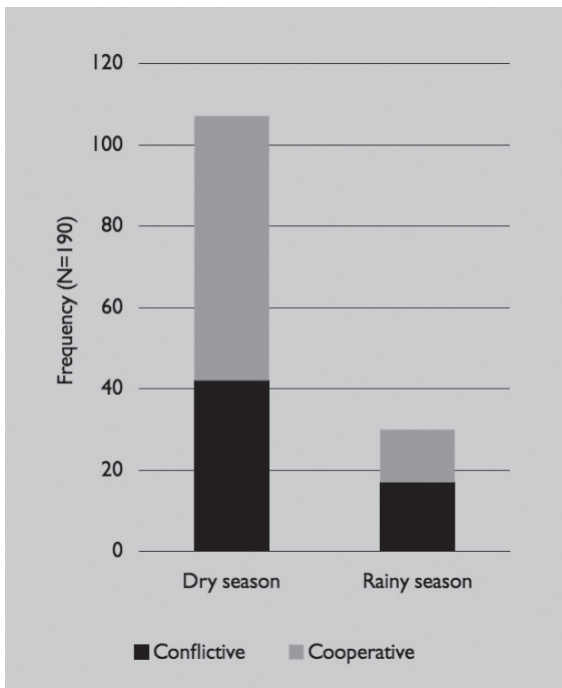
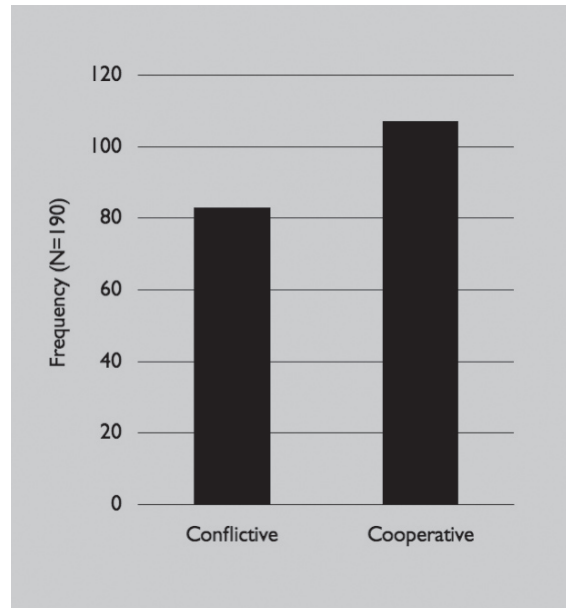


Figure 13. Number of events by character



5. NATURE OF EVENTS

5.1 Character of events

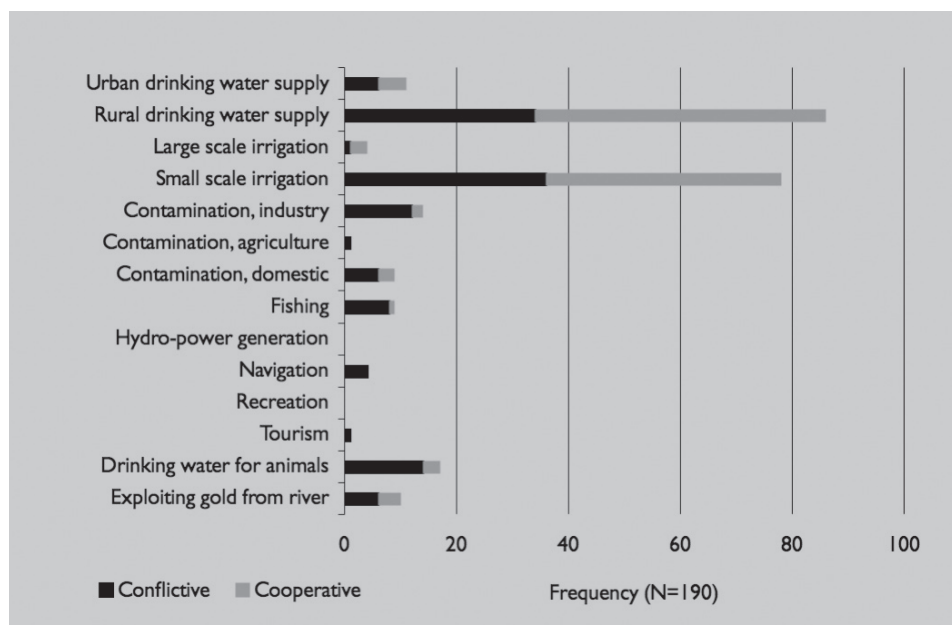
By character, a total of 83 conflictive and 107 cooperative events were identified. The cooperative events comprise a large number of events about the agreement on establishment of a gravity-fed pipe-water system and agreements developed after conflicts mainly with respect to irrigation water use. The key issues of conflictive events are disagreement about water use around gravity-fed piped water system, unequal distribution of irrigation, and water contamination resulted by mining activities. It is noted that conflict resolution is well-developed which contributes the high number of cooperative events.

5.2 Water use types of conflictive and cooperative events

Among the 16 types of water use which are mentioned in the format for event registration, 11 types were encountered during the

Figure 14. Water use types of conflictive and cooperative events in Con Cuong district - more than one option could be chosen

Number of events



inventory of water events in Con Cuong districts. Of these types of water use, rural drinking water supply³ and small-scale irrigation are involved with the highest numbers of events, namely 86 and 78 events, respectively. In these two types of water use, the number of conflictive events is approximately equal to the number of cooperative events. This means that beside disagreements of using water for drinking or irrigation, people seem to be actively involved in finding solutions for conflicts (Figure 14).

Although the industrial sector is not highly developed in Con Cuong district, there is a significant number of events, mostly conflictive events, involved in water use for industry, particularly related to discharge of contaminating substances (n=14). Mining and paper powder processing are the only two industries involved in these events in Con Cuong. The activities of these two industries are also caus-

ing events related to other types of water use, including urban drinking water supply, navigation, drinking water for animals and gold mining (Box 4).

Box 4. Spring contaminated by lead mining (event 4031)

In Tong Chai village, one lead mining company has been operating for four months. Drainage discharged from the lead-extracting process is released 3-4 times every day directly into the Chai spring and irrigation canal where local people use water not only for irrigation but also for domestic use (bathing, dish washing, etc.). People said that the mining company often releases discharge during night-time but sometimes even during day-time. The wa-

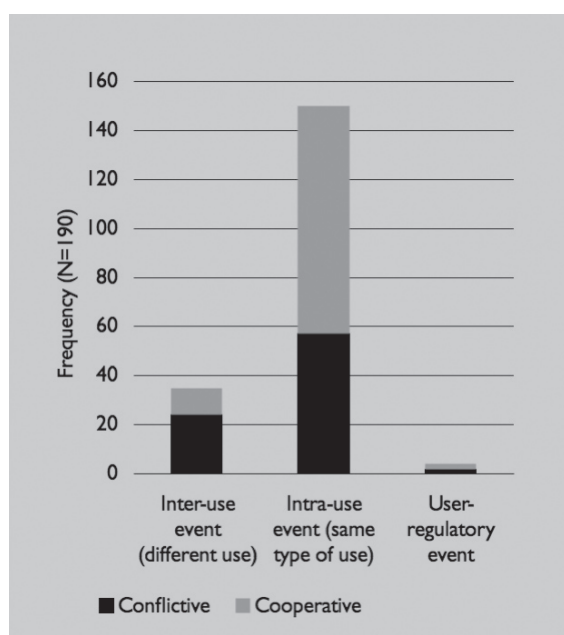
ter flow during that time is black. People are worried about the water contamination. Many of them feel itchy after bathing in the spring. They reported this issue to the rural community committee in the meeting since July 2007; however, the situation is on-going.

5.3 Use diversity of conflictive and cooperative water-related events

Approximately 80% (n=150; 93 cooperative and 57 conflictive events) of the events identified in Con Cuong district took place among water users who wish to use the water for the same purpose, e.g. for irrigation or domestic use only (intra-use events) while the remaining 20% (n=40) of the events took place among water users, wishing to use the water

Figure 15. Use diversity of conflictive and cooperative water-related events in Con Cuong

Number of events



for different purposes (inter-use events), e.g. water used both for irrigation and domestic use such as bathing, cloth washing, etc., or between water users and regulators of water access and use, e.g. between irrigation farmers and irrigation management committee (Figure 15). In Con Cuong, inter-use events mainly concern water use for discharge of contaminating substances and for domestic use or animals.

5.4 Issues involved in conflictive and cooperative water-related events

As mentioned above, rural drinking supply and irrigation are the two main water uses involved in the events identified in Con Cuong (Figure 16).

Events related to issues of development and maintenance of drinking water and irrigation water infrastructure took place more frequently compared to events related to other issues. In addition, cooperative events are more frequent than conflictive events with respect to these issues. Cooperation often takes place among authorities at different levels in support of construction projects for waterworks, between local authorities and water users, or among water users who collaborate to undertake the construction and maintenance of the waterworks.

Although assessments of the water balance for the Ca river watershed show current water demands for domestic uses and livestock and agricultural production can be met by available water resources, water scarcity especially in dry season is a significant issue in a number of events. Water scarcity is a result of uneven distribution of water availability due to the topographical effect. In about 20% of the events, this issue was recorded as the main issue.

Water scarcity is also a factor which may lead to other events. For instance, because

of the lack of irrigation for paddy fields at a critical stage, which will have large impact on grain yields, farmers may try to find a way to get water into their fields. This may cause conflicts among farmers or between farmers and water managers. After conflicts, however, there may also be cooperation between them to find a way to satisfy demands of irrigation water for every farmer (Box 5). Irrigation water use and management is considered as a water issue for these events.

Contamination and damaged water infrastructure are also major issues of conflictive events (Figure 16). Carving water pipes to get drinking water from gravity-fed water-piped systems (public waterworks) is a main issue related to damaged-water infrastructure in the case of Con Cuong district.

Box 5. Conflict and cooperation around uneven water distribution

Due to uneven land surface, water distribution for low and high fields is inefficient. There are mild conflicts among farmers who have high fields and farmers who have low fields, since farmers with high fields cultivate and supply fertilizer and prevent water in their fields from flowing down to neighbours' lower fields. This problem was raised in a community meeting and a solution was found. The leader of the production group instructed farmers to make small canals for water to flow from high fields to low fields.

Figure 16. Issues involved in conflictive and cooperative water-related events in Con Cuong district (more than one option could be selected)
Number of events

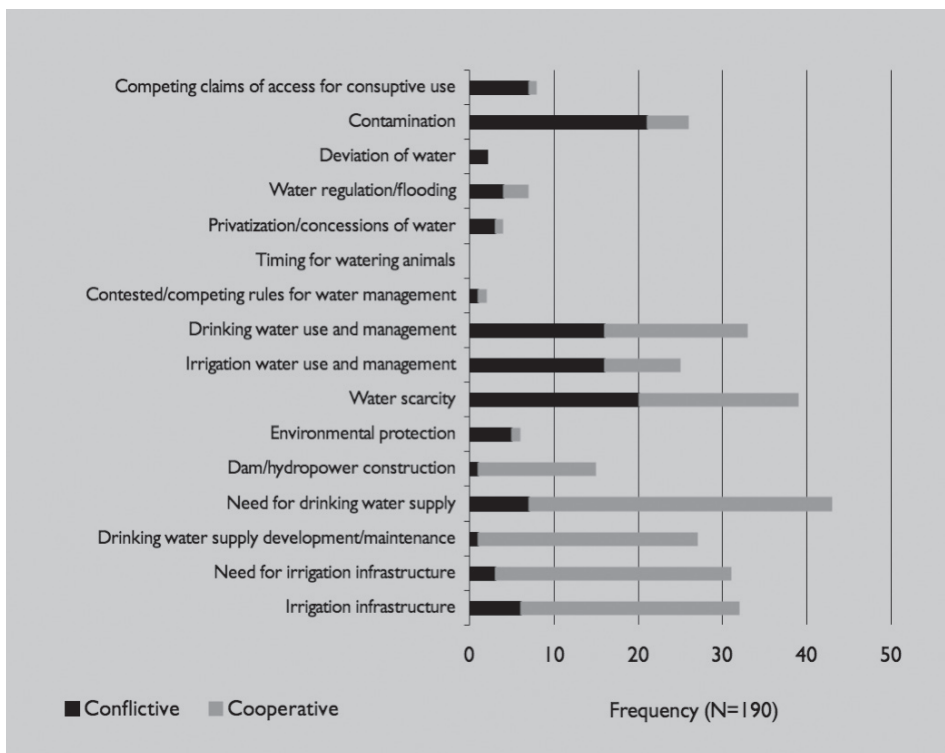
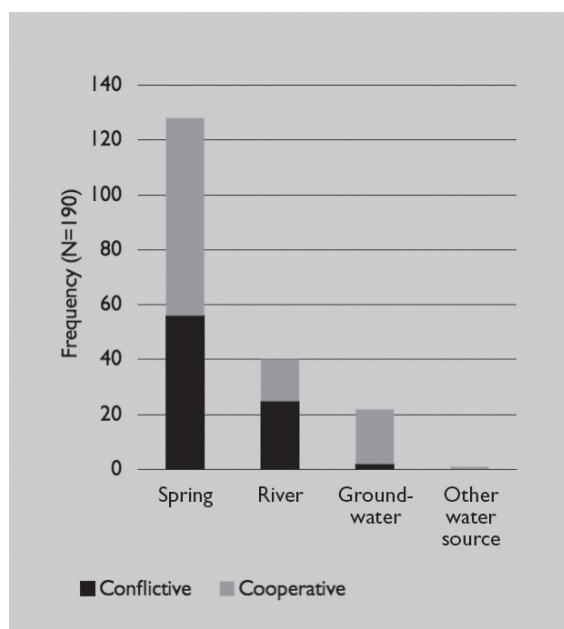


Figure 17. Water sources involved in conflictive and cooperative water-related events in Con Cuong district

Number of events



5.5 Type of water source and infrastructure involved in water events

As a result of the topographical conditions, natural springs are a main water source for both domestic use and irrigation in Con Cuong district. This water source, therefore, is involved in a large number of conflictive and cooperative water-related events which have been identified in the district (Figure 17), followed by the water source ‘river’, which is mainly involved in conflictive events related to discharge of contaminating substances from gold mining or service activities as well as management of irrigation water.

As shown in Figure 17, there are more than 20 events related to groundwater. In these events, groundwater is used for drinking water. Cooperative activities are mainly related to these events, such as the support from the gov-

ernment for constructing wells or well-water sharing among households. Sharing well-water with households who do not have wells is very common in all the communities we visited for inventory work in Con Cuong district. This could be considered a custom in rural areas of Vietnam, particularly in mountainous areas.

5.6 Types of infrastructure involved in the events

84% of the events identified through the inventory work were associated with water infrastructure.

For events related to domestic water use, there are three types of infrastructure involved, including tanks, piped water and wells ranging in descending order in terms of number of events (Figure 18). Tanks and piped-water systems are the main public infrastructures constructed under the Rural Water Supply and Sanitation (RWSS) program. Wells belong to either private households or the community. The more recently constructed wells were funded by the government program for rural development (program 134).

For events related to irrigation, irrigation canals and small dams are the main types of infrastructure involved. Numbers of events associated with these two types of infrastructure are 47 and 30 events, respectively, corresponding to 30% and 19% of the events which involve infrastructure, respectively (Figure 18). It is interesting to see that in the case of irrigation canal-related events, the number of conflictive events outweighs the number of cooperative events, while in the case of small dam-related events, the opposite is the case. Water thefts and uneven distribution of irrigation water are the main reasons causing conflicts related to irrigation canals, while disagreement on location for constructing dams is the main reason for conflicts related to small dams.

Figure 18. Water infrastructures involved in conflictive and cooperative water-related events in Con Cuong district
(more than one option could be selected)

Number of events

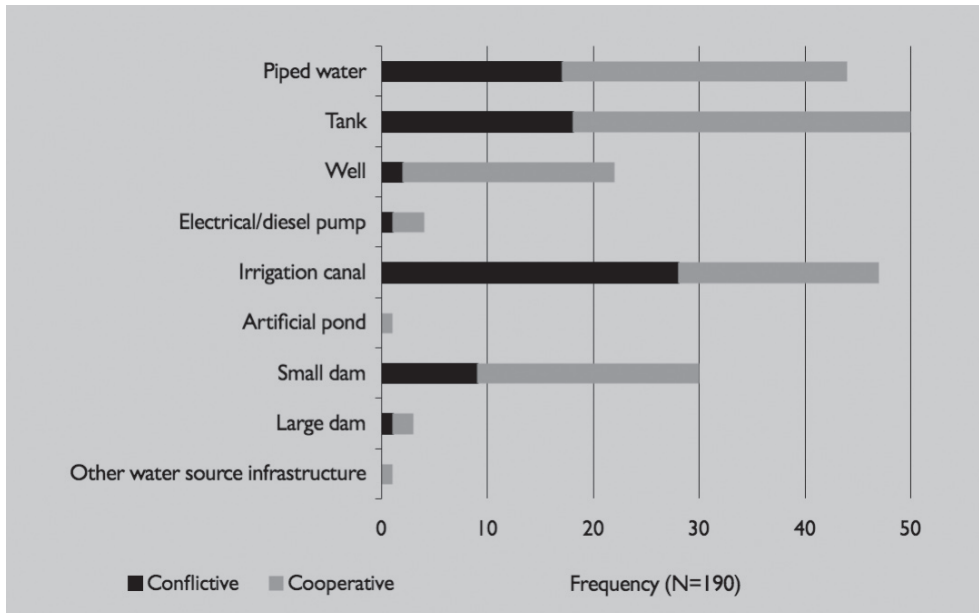
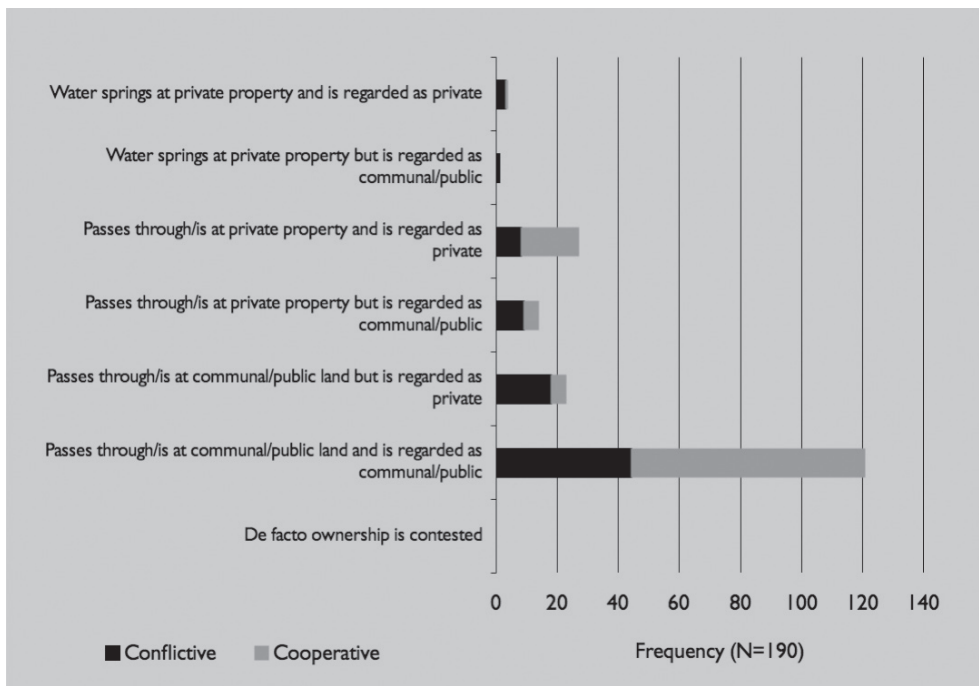


Figure 19. Ownership of water sources involved in conflictive and cooperative water-related events in Con Cuong district

Number of events



5.7 Ownership of water source involved in the events

Ownership of water sources associated with conflictive and cooperative water-related events is presented in Figure 19. As shown in the figure, there is a large number of events related to water sources flowing through public land and being regarded as public property (n=121). Anyone can access this kind of water source. A natural spring flowing through a community is an example. Such events are followed by events related to water sources passing through public land but considered as private and by events related to water sources passing through private land and regarded as private property. Events associated with water passing through public land but considered private tend to be conflictive events about water which is already paid for by the water users. For example, the water for irrigation flowing through the public canal is considered as private in case the water is pumped by an electrical pump and the irrigation water users have to pay for the electricity used for pumping the water. Events associated with water passing through private land and regarded as private are mainly cooperative and do mainly take place with respect to ground-water sources being accessed through wells.

6. EVENT STAKEHOLDERS AND THEIR ACTIONS

6.1 Direct parties involved in the events

Parties, who are directly involved in water-related events, are mostly water users, e.g. domestic water consumers, irrigation farmers, industry, and authorities at different levels of water management as well as infrastructure development (Figure 20).

Of the water users, rural domestic water consumers and irrigation farmers were involved in 60% of the water-related events identified in Con Cuong district.

Urban domestic consumers are present in few events about domestic water. They all use water from either their own well or tap water supplied from the Water Supply Company, in Figure 20 referred to as 'urban public water agency'. These events are mainly about water fee or quality.

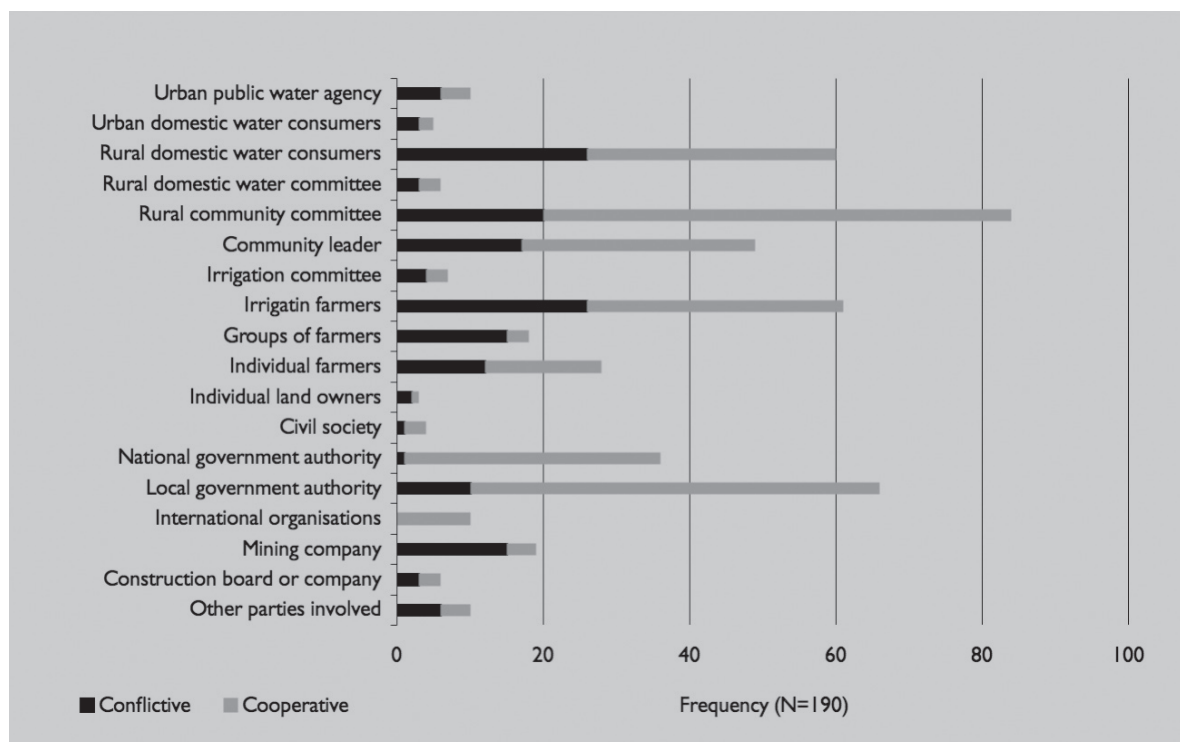
Mining companies, i.e. gold and lead mining, are direct stakeholders in 19 events which are mostly conflictive. Contamination of water sources, e.g. drainage discharged to springs and rivers, is the main issue for the events in which mining companies are involved.

When a conflict between water users takes place in a community, it will often be 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 will join to solve the conflict. However, water users also may collaborate with each other or with community leaders or with authorities at different levels to solve water conflicts or to improve water infrastructure. Therefore, community leaders and local government authorities (rural community committee and CPCs/DPCs) are directly involved in a very large number of events, i.e. 84 and 66 events respectively (Figure 20). Frequently, these organizations act as third parties to mediate conflicts or participate in the development of water projects. That is why more cooperative events see their involvement.

Authority at national level and international organizations are also directly involved in a number of events. Apart from a national authority which participate in one conflictive

Figure 20. Direct parties involved in conflictive and cooperative water-related events in Con Cuong district (more than one option could be selected)

Number of events



event, these parties only participate in cooperative events, through their support for the construction of dams, irrigation canals and piped-water systems.

6.2 Event magnitude

The number of persons directly involved in the events and number persons affected by the events are presented in Table 5. The share of men/women directly involved in and impacted by the events is also mentioned in the table.

Before going into discussion on event magnitude, it is important to note that the number of persons involved in the event or affected by the event, in many cases, is estimated by the number of people living in the community, if the event has taken place at community scale,

or by the number household members, if the event has individual households involved.

As shown in the Table 5, a little more than half of the events involve 10-99 persons, while close to a quarter of the events (23%) involves less than 10 persons and another quarter (23%) involves 100-999 persons. Events with less than 10 persons involved are mainly about well-water use and irrigation water use among several households. Despite their small number ($n=4$), events that involve between 1,000 and 9,999 persons are significantly important, as they take place at large scale with the direct involvement of more than 1000 persons. Gold mining in the Ca river is the main cause of these events. In this case, members of communities who are living along the river are assumed to be directly involved and affected by the event.

Table 5. Estimated number of persons involved and affected in the events in Con Cuong district

	# of events	%
<i>estimated number of persons directly involved in event</i>		
<10	41	23.0
10-99	93	52.2
100-999	40	22.5
1,000-9,999	4	2.2
Total	178	100
<i>estimated share of men/women directly involved in event</i>		
more women actively involved	29	23.0
more men actively involved	34	27.0
men and women equally actively involved	63	50.0
Total	126	100
<i>estimated number of people affected by/ benefiting from event issue</i>		
10-99	38	20.8
100-999	110	60.1
1,000-9,999	34	18.6
10,000-99,999	0	0
>=100,000	1	0.5
Total	183	100
<i>estimated share of men/women affected by or benefiting from the event issue</i>		
more women affected/benefiting	46	25.1
more men affected/benefiting	1	0.5
men and women equally affected/benefiting	136	74.3
Total	183	100

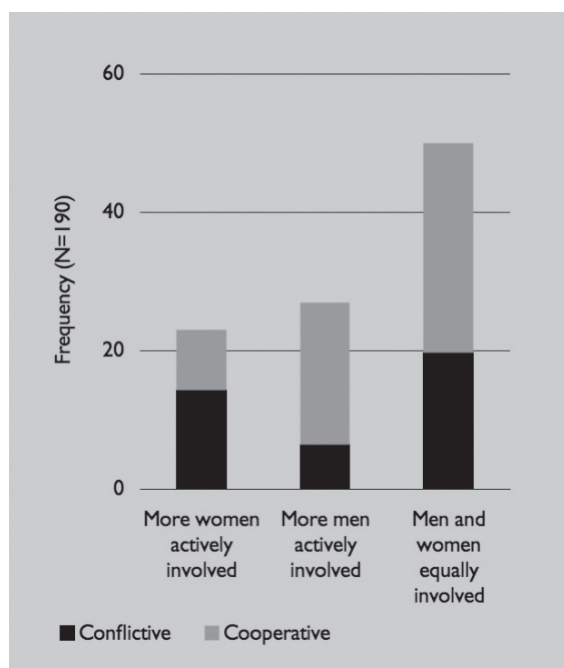
Regarding the ratio between men and women involved in the events, more than half of the events records men and women equally actively involved. The number of events, mainly conflictive, with more women actively involved amounts to 23%. These are often irrigation-related events taking place when farmers manage to get water into their paddy fields. The remaining part of the events involves more men than women. In this share, more cooperative events are seen, mainly about water infrastructure maintenance (Figure 21).

It is worth noting that in most cases the events have impact not only on the involved persons but on a wider range. Up to 60%

of the events may have negative or positive impacts on from 100 to 999 people. The remaining part of events may affect or benefit either small numbers of people (10-99) or very large numbers of people (>1,000). Men and women are equally affected or benefited by the majority of the identified events (74%; Table 5). The remaining part of the events potentially affects or benefits more women. From our experience, women are more influenced by domestic water-related events, particularly those which involve wells and gravity-fed piped-water systems, due to the fact that women are primarily responsible for getting water for domestic use in rural communities in Con Cuong district.

Figure 21. The estimated share of men/women directly involved in events by event character

Number of events



6.3 Types of actions taken during events

Holding public meetings and private meetings between parties are the most common actions being taken in 34% and 25% of the events, respectively (Table 6). These actions happen both in connection with conflictive and cooperative events.

In Con Cuong, a public meeting is usually the same as a community meeting. In most cases, water issues were raised during regular community meetings, i.e. the meetings held mainly for community affairs, including water-related issues. Around water issues, people have a chance to discuss how to sustain water access, for example by working out rules of water access, voting for members of water management board, etc. In such meetings, the rural community committee also works as

mediator in conflicts by suggesting solutions or negotiations which should be made by the involved persons.

In connection with a large number of cooperative events, private meetings were held, often meetings among authorities to discuss water development. In some cases between involved parties with the attendance of third parties to seek solutions and agreements for water events.

As shown in Table 6, the second most common actions taken during conflictive events are private statements of disagreement between the parties and public oral disagreement. In contrast, the common actions taken during cooperative events are private statements of agreement between the parties, written agreements between the parties, and construction and maintenance of public water infrastructure.

Payment in cash or kind is mainly involved in cooperative events, as part of agreements to run water management board or for maintenance activities. For conflictive events, payments in cash or kind mainly take place as the penalty for violating actions, such as water theft or pipe water carving.

Unconditional sharing of water is a common action in events relating to water well-sharing in addition to oral agreements among households. Private water infrastructure construction is also one of the actions involved in the well-water-related events.

6.4 References used to claim in events

Figure 22 below shows references which have been used to support claims in conflictive and cooperative water-related events in Con Cuong district. It can be seen from the figure that most of the events (n=156) take place based on 'urgent and critical need for water'.

Table 6. Types of action taken during conflictive and cooperative water-related events in Con Cuong district (N=190) – more than one option could be selected

<i>Types of actions</i>	<i>Event character</i>				<i>Total of events</i>	<i>%</i>
	<i>Conflictive</i>		<i>Cooperative</i>			
	<i># of events</i>	<i>%</i>	<i># of events</i>	<i>%</i>		
public meetings held	32	16.8	32	16.8	64	33.7
private meetings between parties	14	7.4	33	17.4	47	24.7
private statements of agreement between (some of) the parties	4	2.1	26	13.7	30	15.8
private statements of disagreement between (some of) the parties	31	16.3			31	16.3
oral agreement	4	2.1	18	9.5	22	11.6
public oral agreement			9	4.7	9	4.7
public oral disagreement	15	7.9			15	7.9
public written statements of disagreement submitted to third parties/ external authorities	4	2.1	1	0.5	5	2.6
written agreement - not sanctioned by third party	1	0.5	22	11.6	23	12.1
written agreement - sanctioned by third party			5	2.6	5	2.6
payment in cash or kind	2	1.1	12	6.3	14	7.4
unconditional sharing of water	2	1.1	12	6.3	14	7.4
public water infrastructure	13	6.8	53	27.9	66	34.7
<i>public water infrastructure obstructed</i>	5	2.6			5	2.6
<i>public water infrastructure destroyed</i>	8	4.2	1	0.5	9	4.7
<i>public water infrastructure stolen</i>	6	3.2	1	0.5	7	3.7
<i>public water infrastructure constructed</i>			28	14.7	28	14.7
<i>public water infrastructure repaired/protected</i>			21	11.1	21	11.1
private water infrastructure			8	4.2	8	4.2
<i>private water infrastructure constructed</i>			8	4.2	8	4.2
<i>private water infrastructure repaired</i>			1	0.5	1	0.5
private property (land, crops, houses, animals...)	5	2.6	1	0.5	6	3.2
private property protected			1	0.5	1	0.5
private property destroyed						
private property other	3	1.6			3	1.6

This is followed by reference made to ‘investment in infrastructure to use water’ with 40 events, corresponding to approximately 20% of the events. Investments in infrastructure to use water may have been made labour or in cash, for instance by local people contributing working days during the construction time or a percentage of the total construction cost. As shown in Figure 22, most claims made as part of cooperative events are based on this reference.

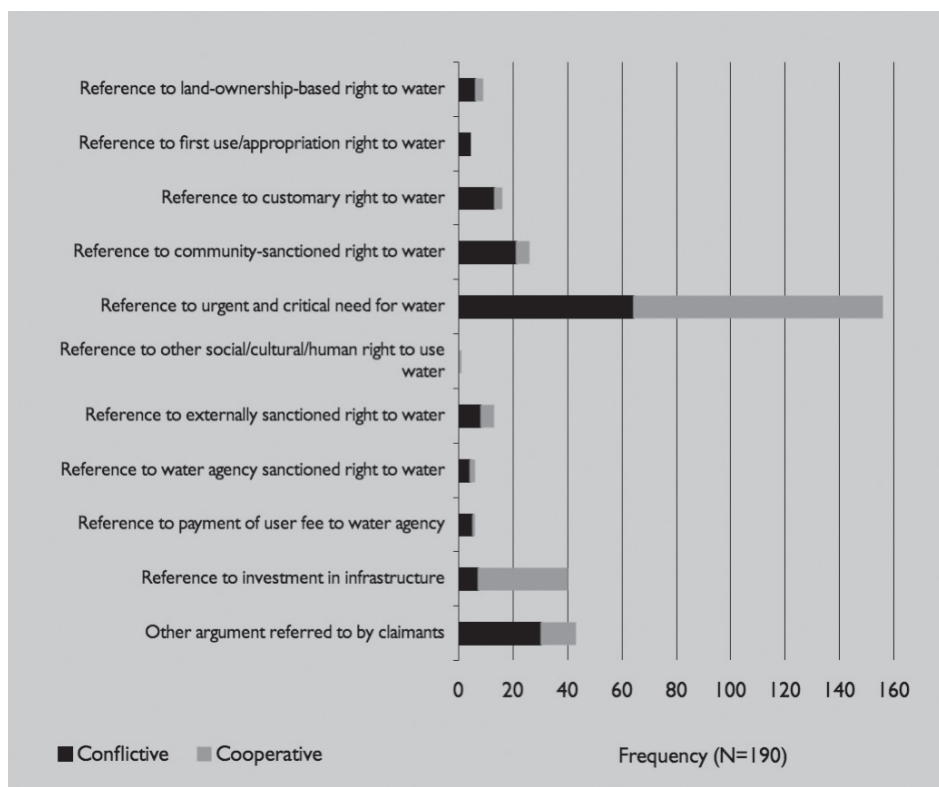
In approximately 10% of the events reference is made using ‘community sanctioned right’ in support of the claims made. The use of ‘community sanctioned right’ is based on community water-related rules written in a book which is called *huong uoc*

in Vietnamese. Rules in the book are often modified to keep pace with changes in the community.

In some events claims are made on the basis of belonging to the neighbourhood. Our experience is that people in the surveyed communities often are willing to share well-water for domestic use. They think that people have lived together in the community for a long time, therefore, they would feel uncomfortable if their neighbours lack water for domestic use, while water is available in their own wells. This refers to the reference ‘social/cultural/human right to water’ in the graph.

Figure 22. References used to claim in conflictive and cooperative water-related events in Con Cuong district (more than one option could be selected)

Number of events



7. INTENSITY OF EVENTS

Based on the intensity scale developed by the Competing for Water program (Table 1), the intensity of the collected events has been assessed. The result of intensity assessment is presented in Figure 23.

For the conflictive events, their intensities range from -1 to -4 according to the intensity scale. Of the conflictive events identified through inventory work, the majority (45 events) had the intensity of -3, which involve denouncements made to the third parties, while 29 events had the intensity of -1, reflecting verbal disagreement or informal verbal disputes. This means that while about half of the conflictive events have been reported to third party, there are still more than one third of the conflictive events taking place at low-intensity scale/verbal disagreement between the parties. Although 45 events have

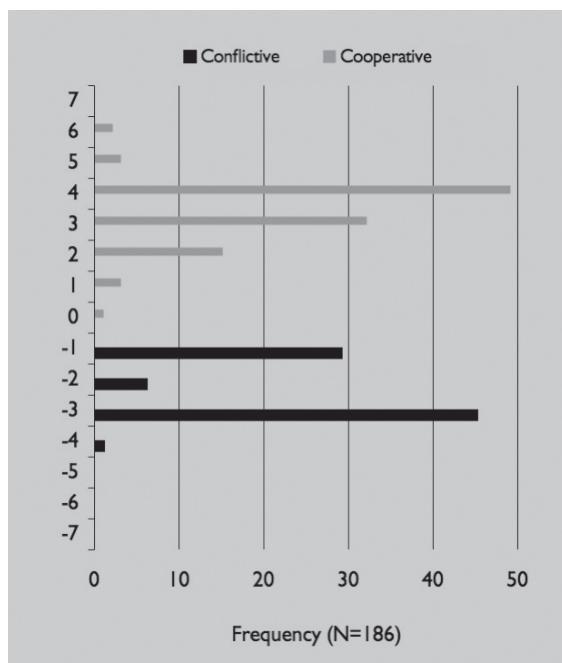
been denounced to third party, it should be noted that the level of third party involvement mainly remains at community level (see more in section 8).

For the cooperative events, their intensities are more spread according to the intensity scale, ranging between 1 and 6. Most of the cooperative events have the intensities '3' and '4', corresponding to verbal/written agreement with or without third party involvement. Most of the events which have the intensity 4 are related to construction of water infrastructure, such as dam, irrigation canal and gravity-fed piped water. The agreements on water infrastructure development are made at different authority levels. Some of them are the agreements which were reached after negotiations made by involved parties themselves without the mediation of third party. Examples of such events is when after some conflicts, agreements on timing of cultivation or making small gutters to lead water to the fields are reached by the irrigation farmers themselves. If endorsement from community leader or irrigation committee leader is needed, the events are scaled at intensity 3.

At present, there are about 30 boats exploiting gold along the river. Gold mining has become an urgent problem in many communes in Nghe An, which caused accumulation of mud, deviation of water, contamination, etc. While Bai Gao hamlet does not allow gold mining on the river side under its management, many other communities do. According to local people, the gold mining can cause land erosion, water deviation, water pollution (dirty, contaminating substances such as mercury, oil). In the meeting in the hamlet with people council committee representatives, the inhabitants expressed their concerns and asked them to stop gold mining on Ca River.

Figure 23. Event intensity according to local water event intensity scale (Table 1)

Number of events



8. INVOLVEMENT OF THIRD PARTY

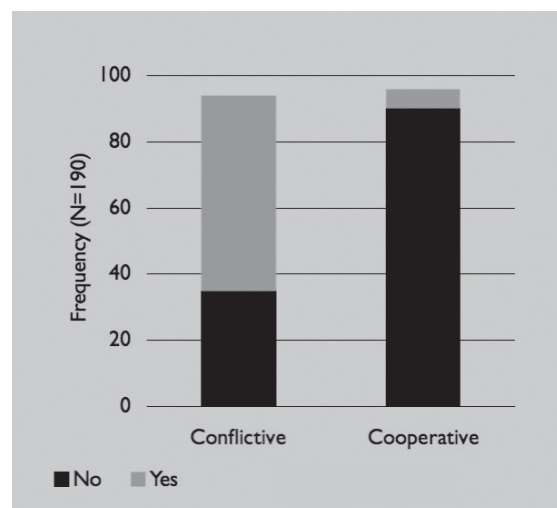
8.1 Formal demands submitted to the third party

The formal demands may be submitted to responsible officials and related agencies as written requests or as oral reports during public meetings or visit meetings paid by officials, either to state the issues or to call third party mediation. They are submitted by the directly involved actors or their authority representatives (Box 6).

It is not surprising that of the majority (91% of the 65 events submitted to third parties) of the events as part of which demands were submitted to a third party are conflictive (Figure 24). The following section will discuss in more detail who are the stakeholders call-

ing upon third party, and who are called upon as third party in water-related issues.

Figure 24. Formal demands submitted to the third party in conflictive and cooperative events



Box 6. Formal demand submitted to an official during his visit to the community

At present, there are about 30 boats exploiting gold along the river. Gold mining has become an urgent problem in many communes in Nghe An, which caused accumulation of mud, deviation of water, contamination, etc. While Bai Gao hamlet does not allow gold mining on the river side under its management, many other communities do. According to local people, the gold mining can cause land erosion, water deviation, water pollution (dirty, contaminating substances such as mercury, oil). In the meeting in the hamlet with people council committee representatives, the inhabitants expressed their concerns and asked them to stop gold mining on Ca River.

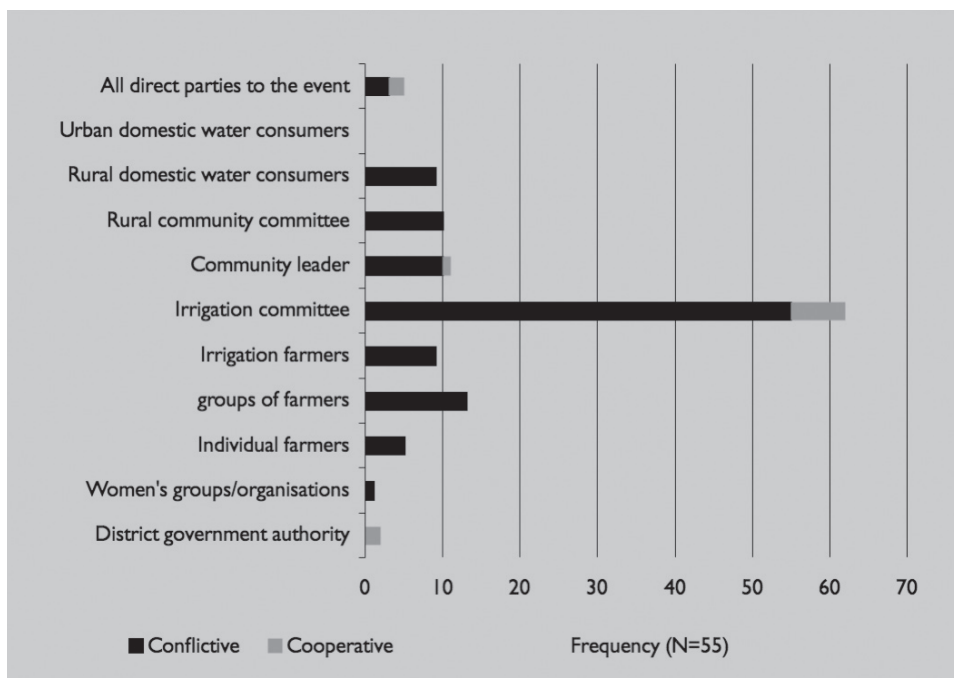
8.2 Stakeholders calling upon third party

Stakeholders who are involved in the events as direct parties and call upon third party are presented in Figure 25.

Rural drinking water and irrigation are the two main uses involved in conflictive events among water users, which explains the fact that groups of farmers, irrigation farmers, and rural domestic water consumers are the main stakeholders directly calling upon third party to solve their conflict. The levels they contacted, mainly remain at community level. Often they reported directly to the community leader and the rural community committee during community meetings. The reason why local people do not contact directly with third party at higher levels is assumed to be that the distance from the community to the commune office seems to be too far and the intensity of conflicts not strong enough to justify this effort.

Figure 25. Stakeholders calling upon third party (N=55)
– more than one option could be selected

Number of events



The data shows that community leaders and rural community committees play a role in a number of events calling for third party, not because they are the directly involved actors, but they are the ones who represent water consumers calling for higher authority. As discussed above, the involved actors often report issues to them, so if the issues are beyond their tasks and responsibilities and need to be reported to a higher level, they are the ones to represent the involved actors and call the third party.

It is necessary to note that although rural community-based organizations such as women's associations, farmer associations, youth associations, elderly people associations, veteran associations, and irrigation committees are well organized and work actively in Vietnam in general, and in the study sites in particular, their role in solving con-

flicts, or in other words in calling upon third party or acting as external party, so far has not been well recognized. The data shows that there is only one event which sees civil organization involvement as external party, in this case the women's association, calling third party because of contamination by lead mining. Particularly irrigation committees and rural domestic water committees have not fully shown their important role in water-related conflicts.

8.3 Types of third party called upon

Municipal/district authorities and local-level authorities are often called upon as third party. Among water conflictive events, 23 of them are reported to community committees, 15 reported to CPCs and 12 reported to DPC. It is noted that events are normally

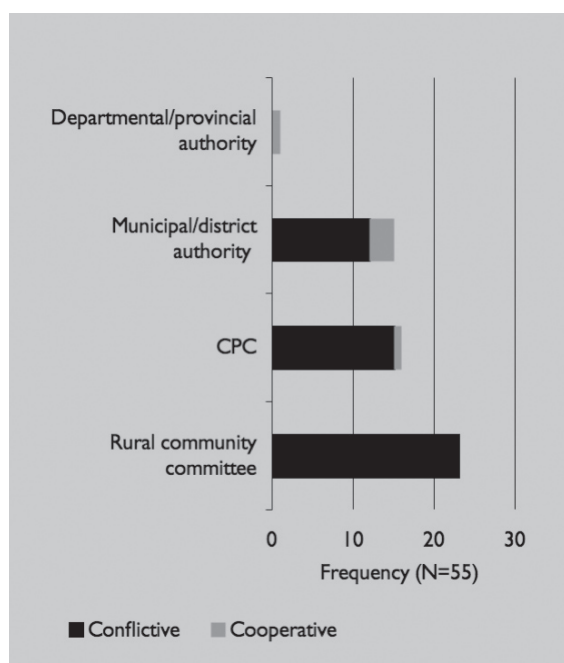
reported bottom-up, from community committee to commune committee, to district and higher ones.

For cooperative events in which a third party was called upon (five events), the the Provincial People's Committee (PPC) in one event, DPC was called upon in three cases, and the CPC in one event.

Figure 26. Stakeholders are called upon as third party (N=55)

– more than one option could be selected

Number of events



9. OUTCOMES OF EVENTS

9.1 Assessment of who gained in the events

Figure 27 depicts who are the gainers in competitive events, defined as the ones who won in conflictive events or the beneficiaries of cooperative events.

As discussed above, since 2001 a large number of the development programs

funded by the government and international organizations have been implemented to support disadvantaged areas including Con Cuong district to set up water infrastructures to help local people improve their water access and water quality, for instance gravity-fed piped-water systems, wells for domestic use, and irrigation works such as dams and concrete irrigation canals. Thus, the beneficiaries of such development programs are rural domestic water consumers and irrigation farmers. It can be said that these groups are the gainers of those cooperative events, in about 45% of total events. In specific, irrigation farmers are the gainers in 41 events and rural domestic consumers are the gainers in 31 events.

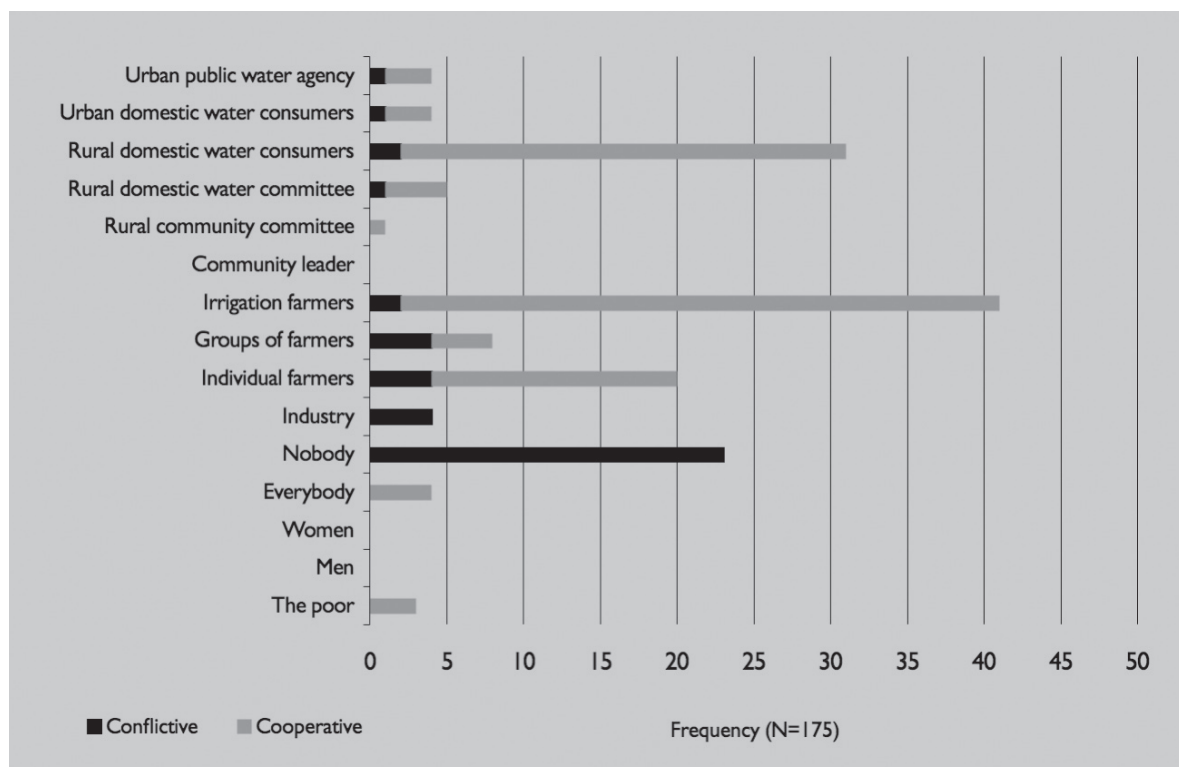
Besides the support from those programs, the local people cooperate themselves to improve their access to domestic water by sharing private wells with neighbours. They may contribute labour, implements when digging and dredging wells or just simply make verbal agreements. Individual households or individual farmers are the gainers in these well-related cooperative events.

It is not surprising that there is no clear result for the 23 conflictive events, in other words nobody gained in these ones. The conflicts are ongoing and the involved parties have not found solutions to their conflicts.

The poor are the gainers in three cooperative events. It should be emphasized that the poor in these events are the intended target beneficiaries of the project. For other events, in general it can be concluded that the poor may be the ones to get more benefit than other groups; however, they are not the target beneficiaries. The water project aims at benefiting all water domestic consumers, including the poor.

Figure 27. The gainers in competitive conflictive and cooperative events
– more than one option could be selected

Number of events



9.2 Assessment on who lost in the events

The data presented in Figure 28 reveals that in 88 out of 177 events for which the losers could be determined, nobody were assessed to have lost. These are all cooperative events. All parties involved benefited, at least to some extent, from these events.

Rural domestic consumers, groups of farmers, irrigation farmers, individual farmers, the involved actors in most events, are the losers in a number of events with frequencies of 18, 16, 14 and 10, respectively. These events are all conflictive. However, overall the number of events where these categories of users gained are higher than that where they lost.

Regarding conflictive events, most conflicts are solved through solutions reached among the direct parties and also through mediation from external parties, often the community leader, the rural community committee, CPCs and DPC. However, there are some conflicts which are still on-going, although they have been reported to third parties many times, for example contamination caused by gold and lead mining, paper powder processing. In these events water consumers are persons who are still affected and are 'losers' while the industry is 'gainer'. The data shows that industry is involved in 19 events, and assessed to be the loser in only three events. This implies that their activities are going on and continue contaminating water sources and threatening local people's water access.

Figure 28. The losers in competitive conflictive and cooperative events

Number of events

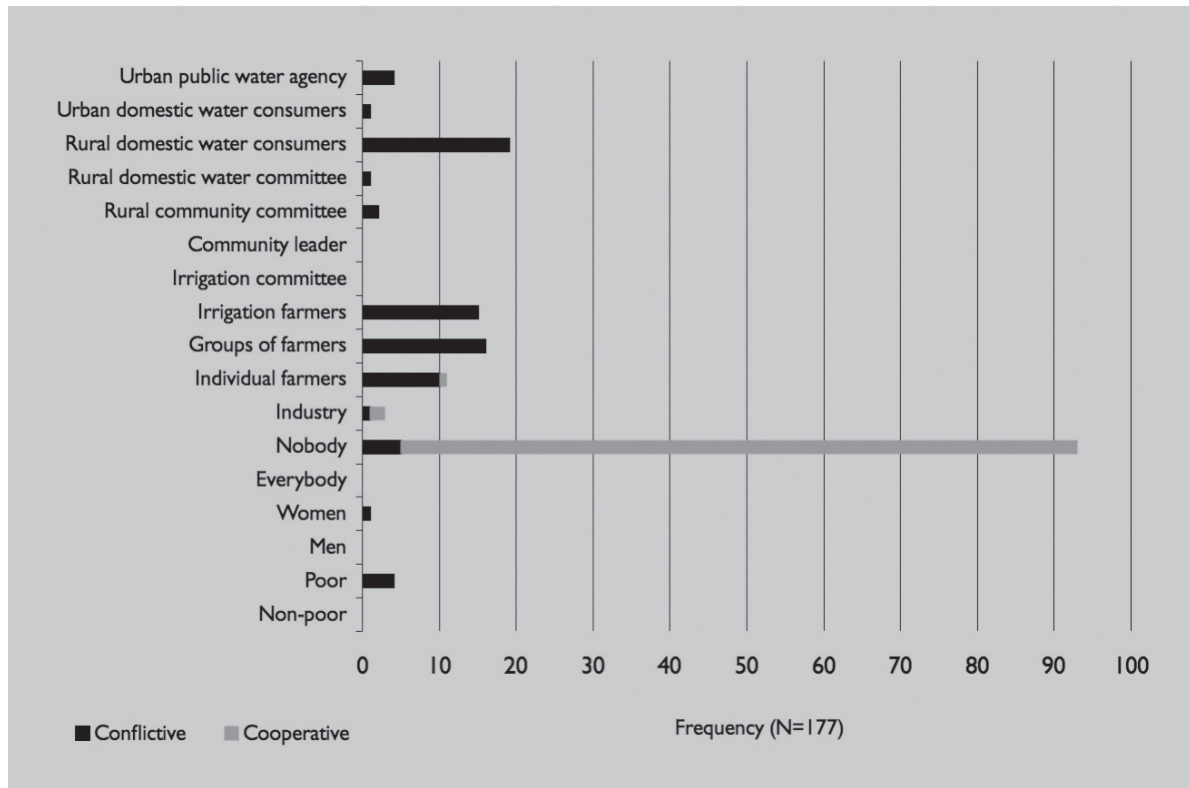
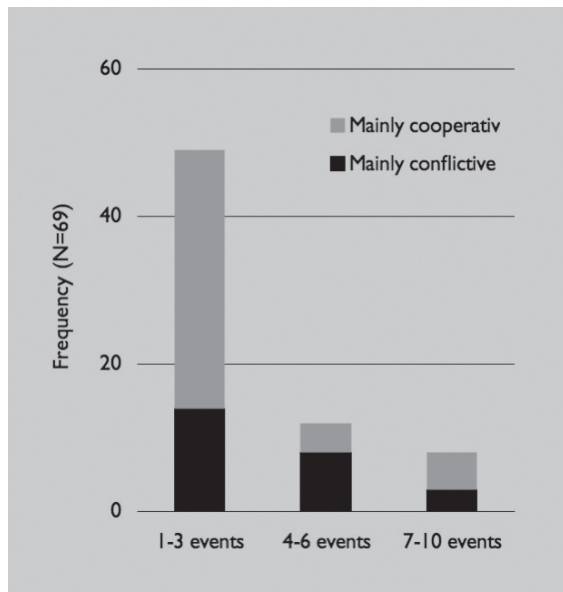


Figure 29. Number of events per situation (N=69)

Number of situations



10. SITUATION AND EVENTS

10.1 Number of events per situation

The number of events per situation ranges from 1 up to 10. Of a total of 69 situations, 49 situations consist of between one and three events. 71% of these situations are characterized as ‘mainly cooperative’. 12 situations consist of between four and six events while eight situations consist of between seven and 10 events (Figure 29). The situations cover conflictive or cooperative events or both as shown in Figure 29.

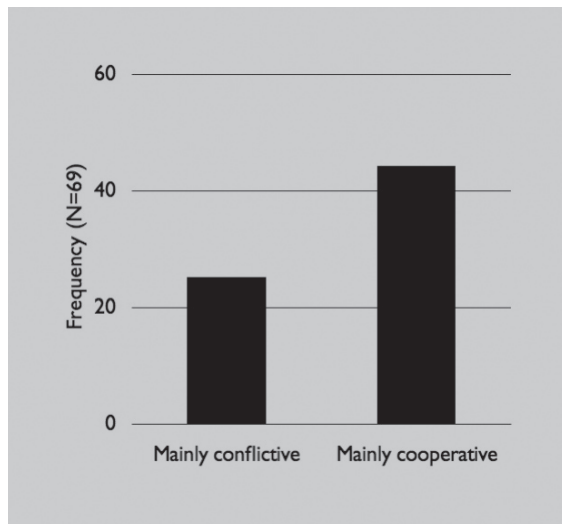
10.2 Character of situation

Figure 30 shows that the number of mainly cooperative situations is almost the double of

that of mainly conflictive situations (44 and 25 situations, respectively).

Figure 30. Overall character of situation

Number of situations



10.3 Current status of water situation

Of 25 mainly conflictive situations, there are 17 situations in which some conflictive

events are still on-going; five situations have been settled and agreements are kept. The on-going conflictive situations are mainly about irrigation water, such as unequal distribution and irrigation water stealing, something which frequently happens during the dry season.

Among total of 44 mainly cooperative situations, 32 situations are on-going at a similar or steady intensity or in which cooperation is further strengthening, which indicates that the involved parties keep their agreements and/or develop common water management mechanisms to secure their access to water. In four situations cooperation is weakening or has broken down. This means that the involved parties or one of them has violated agreed rules or that water-related issues among them occur some times during their cooperation. In the remaining part of the mainly cooperative situations cooperation has ended due to external factors or was established just for the time being, during the construction period, for example (Table 7).

Table 7. Current status of water situation (N=69)

<i>Current status of mainly conflictive situation</i>	<i>Frequency</i>	<i>Current status of mainly cooperative situation</i>	<i>Frequency</i>
ongoing at similar/steady intensity	17	ongoing at similar/steady intensity	32
has been settled and agreements are kept	5	cooperation is strengthening	2
has been settled but agreements are regularly violated	1	cooperation is weakening	4
other	2	cooperation is breaking	0
		other (cooperation ended or temporary)	6
Total	25		44

10.4 Mechanism used as part of situation

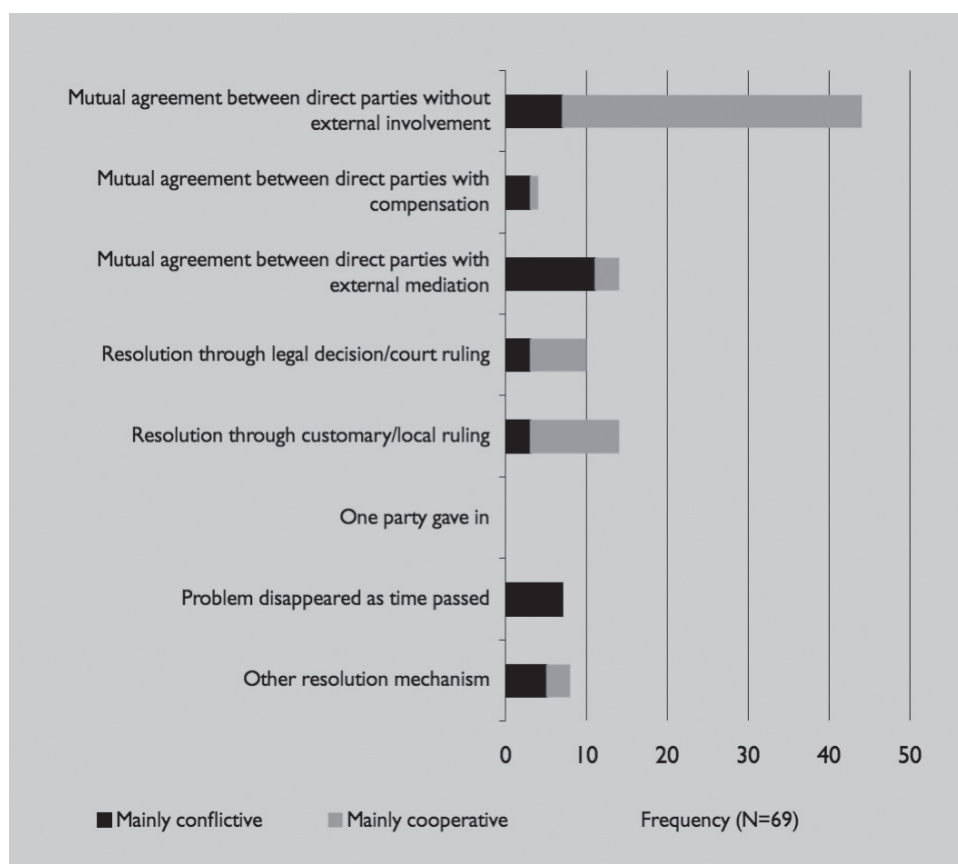
Mutual agreement between direct parties with or/and without external involvement and customary/local ruling is used as part of all situations (Figure 31). It is understandable that cooperation is mainly established based on mutual agreements between direct parties without external involvement. Involved parties use this kind of mechanism in 44 situations. Mutual agreements are sharing water with neighbours, making agreements on when to cultivate in order to secure enough water for all or making agreements on water works maintenance activities, etc.

For the mainly conflictive situations, mutual agreement between direct parties to solve their conflict is also seen, but with external mediation, normally by the local rural community. Thus, the local rural community plays a very active role in mediating water-related events and situations. There are 11 situations using this kind of mechanism.

Customary/local rules are used in 11 mainly cooperative and three mainly conflictive events. In addition, there are some conflicts which disappeared as time passed or which go on forever, for example events relating to irrigation water scarcity caused by unequal water distribution.

Figure 31. Mechanism used as part of mainly conflictive and mainly cooperative situation

Number of situations



II. CONCLUSION

The analysis has discussed the nature, the extent and the intensity of water-related events and situations, which are categorized as conflictive and cooperative ones. The analysis has also presented the major issues that are closely linked to occurrence of water events. Furthermore, investigations have been made concerning the involvement of both the directly involved internal actors, , and external ones, who are called upon to mediate in the competitive events, in order to reveal which actors are actively involved in water-related events and which institutions they often contact, when they have competing claims. The outcomes of events are also explored to see which parties gained or lost in each event.

More cooperative than conflictive events were identified. A higher proportion of conflictive than of cooperative events were denounced to third parties, the level of authority receiving claims and called upon as mediators, however, remaining at the rural level. Events not being submitted to third parties mainly ended up with verbal disagreement.

Most of the identified events took place within a single community or at local scale and among users wishing to use water for the same purpose. Inter-use events, i.e. events among water users wishing to use water for different purposes, are less frequent, mostly taking place across communities, affecting a large number of people and seeing water source contamination as a main issue.

Rural drinking water and small-scale irrigation are the two main water use types involved in large number of identified events. As a result, rural domestic consumers and groups of or individual irrigation farmers are frequently found as the direct actors in those events.

Development and maintenance of drinking water and irrigation water infrastructure are associated with many events, especially the cooperative ones. These are the results of support programs of the government as well as international organizations.

Women and men are equally involved and affected in the majority of events. However, in many cases even more men are found actively involved in the events while more women than men tend to be affected or benefiting from the events. Women are more involved in domestic water events.

Water scarcity caused by uneven distribution of water is a significant issue which leads to the majority of conflicts in the study site among water consumers and also with water managers; however, through mechanisms such as mutual agreements and local rules, water consumers also mutually collaborate and collaborate with community leaders or authorities to find appropriate water regulation and management to secure their water access.

Cooperation often takes place in the wake of conflicts often involving the directly involved parties themselves with or without mediation of external parties. However, there are also conflicts occurring after cooperation, since the involved parties break agreed rules.

Community leaders and rural community committees are seen as direct parties to high number of events but often they take part as representatives of water users rather than competing water users. They act as mediators and call for involvement of third parties. The roles of community leaders and rural community committees have shown their important and active role not only in the general issues of the community but also in water-related issues. Thus, there is a need to consider giving them a higher-level mandate or water governance role even where they actually do not have authorization.

The support from the government and the international development programs, and cooperation among water consumers and authorities at all levels in improving water infrastructure have improved the water quality and also water access for local people, rural domestic water consumers and irrigation farmers in particular. However, to improve the efficiency of water development programs, sustainability, i.e. how to maintain water infrastructure, should be considered – or in other words how to keep the cooperation on-going effectively, reduce potential conflicts, better organize and strengthen management and maintenance activities.

The role of rural community-based organizations in solving water-related issues has not been highly recognized in Con Cuong district. Therefore their participation in decision making and their participation in planning, implementation, and maintenance of local infrastructure, particularly their mandate in water-related issues, should be highly considered.

In conclusion, the analysis of the nature, the extent and the intensity of water-related events and situations in an upland district of Vietnam can provide lessons for local water governance and would help decision makers in the development of well-functioning management systems and institutional structures towards sustainable water resource management.

NOTES

- ¹ The focus group discussions were undertaken with representatives from community organizations. If their contribution to the event identification is relatively equal, they are considered as one information source, coded as community organizations. If one of them highlighted more information for events or was individually interviewed, he/she is considered as other source and given other code.
- ² Program 134 and 135 are national socio-economic development programs for disadvantaged, remote and mountainous areas.
- ³ Rural drinking water supply is about water from the gravity-fed piped-water system. The gravity-fed piped-water system is established in rural areas with funds from the government and international organizations to supply domestic water for rural people. The water is led from upstream source by pipe to cemented tanks. The tanks are shared by groups of several households. Every one can access the water without fee.
Urban drinking water supply is about water supplied by the Water Supply Company. In the district, only people in the town can approach this kind of water. The users have to register with the company and pay a monthly fee based on consumption quantity.

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