

# WATER, CRISIS AND CLIMATE CHANGE ASSESSMENT FRAMEWORK (WACCAF)

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# WATER, CRISIS AND CLIMATE CHANGE ASSESSMENT FRAMEWORK (WACCAF)

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## ACRONYMS

<b>FOEME</b>	Friends of the Earth Middle East
<b>GLOFs</b>	Glacial lake outburst floods
<b>GTZ</b>	Deutsche Gesellschaft für Technische Zusammenarbeit [German Society for Technical Cooperation]
<b>IfP</b>	Initiative for Peacebuilding
<b>Lpcd</b>	Litres per capita per day
<b>NEPAD</b>	New Partnership for Africa's Development
<b>NGO</b>	Non-Governmental Organisation
<b>UNDP</b>	UN Development Programme
<b>UNESCAP</b>	UN Economic and Social Commission for Asia and the Pacific
<b>UNESCO</b>	UN Education Scientific and Cultural Organisation
<b>UNFCCC</b>	UN Framework Convention on Climate Change
<b>WACCAF</b>	Water, Crisis and Climate Change Assessment Framework
<b>WEDC</b>	Water, Engineering and Development Centre
<b>WGMS</b>	World Glacier Monitoring Service
<b>WHO</b>	World Health Organization
<b>WWAP</b>	World Water Assessment Programme

# 1. INTRODUCTION

## 1.1 BACKGROUND

Climate change will negatively affect livelihoods in many developing countries and will increase competition over natural resources in many places. Water resources – a key source of livelihoods and indispensable for human health and sanitation – are already scarce in many regions and will be further affected by climatic changes. In this context, competition over and crises around the resources between and within countries are expected to happen more frequently. Disagreements over water-allocation priorities can easily exacerbate already existing tensions, as water is a source of power and its management often follows socio-political structures.<sup>1</sup> At the international level, dam projects or the depletion of transboundary aquifers cause tension. Within states, marginalisation of poor populations can manifest in diminished access to drinking and irrigation water supply. Marginalisation can also fuel disagreements between water users with competing interests, such as farmers and nomads. However, even where water resources are not scarce, conflict over distribution is frequent because ‘[T]he problem we face today is largely one of governance: equitably sharing this water while ensuring the sustainability of natural ecosystems’.<sup>2</sup>

At the same time, water provides great potential for cooperation: existing formal or informal methods of water management can help diminish tension and develop benefit-sharing activities,<sup>3</sup> and climate change-induced changes highlight the need for common approaches and collective adaptation. Looking back at disputes over water between states, the potential for cooperation becomes obvious – history shows that feuding states have overwhelmingly chosen cooperation over war to solve their water disputes.<sup>4</sup> The claims that this century’s wars will be fought over water resources should be re-evaluated in light of this information. That is not to say that water will not be an increasing source of tension between states competing for this scarce resource, but the real crisis and potential for conflict seems to reside within states and especially at the local level.<sup>5</sup>

Understanding local water conflicts and strengthening crisis prevention by identifying and addressing the root causes of conflict is of high priority in the face of these trends. However, analytical tools for assessing the relationship between water resources and conflict are still rare – although such instruments are urgently needed to design appropriate responses.<sup>6</sup> In addition, tools and training addressing water conflict mostly focus on the transboundary level and fail to address the local and intrastate level. In addition, they do not take into account the specific challenges related to climate change or pre-existing socio-political conflict. The role of water in peacebuilding and conflict-prevention processes remains insufficiently explored. While improved water supply gained high priority in the context of the Millennium Development Goals, the New Partnership for Africa’s

1 UN Development Programme (UNDP) (2006). *Human development report. Beyond scarcity: Power, poverty and the global water crisis*. Gordonsville: Palgrave Macmillan.

2 UN Education Scientific and Cultural Organisation (UNESCO)/World Water Assessment Programme (WWAP) (2006). *Water: A shared responsibility*. UN World Water Development Report 2, Paris: UNESCO/WWAP, p.3.

3 A. T. Wolf (2002). ‘The importance of regional cooperation on water management for confidence-building: Lessons learned’. International Workshop on Transboundary Water Cooperation and Sustainable Peace, San José, Costa Rica; Friends of the Earth Middle East (FOEME) (2005). *Good water neighbors: A model for community development programs in regions of conflict. Developing cross-border community partnerships to overcome conflict and advance human security*. Amman/Bethlehem/Tel Aviv: FOEME.

4 E. Lecoutere, B. D’Exelle and B. Van Campenhout (2010). *Who engages in water scarcity conflicts? A field experiment with irrigators in semi-arid Africa*, Research Working Paper 31. Brighton: MICROCON. Available at: [http://www.microconflict.eu/publications/RWP31\\_EL\\_BD\\_BVC.pdf](http://www.microconflict.eu/publications/RWP31_EL_BD_BVC.pdf)

5 A. T. Wolf (1999). ‘Water and human security’. *AVISO Bulletin*, Vol. 3.

6 A. Gaus and A. Houdret (2009). *Environmental conflict trainings: A synopsis of approaches and further needs*. Initiative for Peacebuilding/European Commission: Brussels. Available at [http://www.initiativeforpeacebuilding.org/resources/Environmental\\_Conflict\\_Training\\_Report\\_2009-08-17.pdf](http://www.initiativeforpeacebuilding.org/resources/Environmental_Conflict_Training_Report_2009-08-17.pdf)

Development (NEPAD), and other initiatives, many actors in the water sector still stick to classic water supply and management projects without sufficiently considering conflict and cooperation potential.<sup>7</sup>

## 1.2 INITIATIVE FOR PEACEBUILDING

Having identified the need for a tool assessing the links among water resources, conflict and climate change, adelphi developed the Water, Crisis and Climate Change Assessment Framework (**WACCAF**). It is funded through the EU's Peacebuilding Partnership Programme, which finances development and research activities related to conflict prevention, mediation and peacebuilding. The framework builds upon the outcomes of the EU's Initiative for Peacebuilding (IfP).<sup>8</sup> As part of IfP, adelphi worked together with partners from Africa, the Middle East, the Caucasus and Europe on natural-resource management and peacebuilding. The continuation of these research and training activities is IfP – Early Warning, funded by the same programme and carried out by a network of nine European civil society organisations.<sup>9</sup> Within this project, adelphi focuses its activities on the cluster "Climate Change and Conflict".

## 1.3 PURPOSE OF THIS TOOL

This tool attempts to fill identified gaps in dealing with environmental and water conflict in research and practice. Choosing to name the tool Water, Crisis and Climate Change Assessment Framework emphasises the context in which conflicts can develop. Abrupt change can occur in an environment with unstable or complex conditions, such as a crisis in political, social or economic affairs. Considering water crisis as a starting point, the tool is centred on conflict potential arising from increased competition over water access and/or availability between user and/or management groups in the water sector. Competition and insufficient water availability can be caused by natural phenomena such as climate change or by unequal allocation. Taking a look at the root causes and factors of these conflicts, the tool also assesses the root causes and factors of conflicts and considers crises in the broader socio-political context, thereby allowing for a practical assessment of existing or potential conflict trends. It is based on the assumption that conflicts over natural resources and the environment are always embedded in a broader setting, where socio-political, environmental and economic factors create potential crisis situations and offer entry points for cooperation.<sup>10</sup>

The assessment therefore includes:

- (1) Analysis of water access and availability;
- (2) Study of the broader context;
- (3) Identification of conflict prevention and cooperation potential;
- (4) Concise summary of key findings and results, guided by a typology of water conflicts.

Water access and availability is analysed by taking into account three factors: water management and infrastructure; environment and human impact; climate change. The full water analysis is then considered in a broader context by looking at the socio-political setting and marginalisation, existing or previous conflicts, as well as international factors such as transboundary water resources. The assessment then looks at existing ties among (potential) conflict parties, institutions for conflict mediation, and forms of negotiation, as well as peacebuilding opportunities within the water sector itself and beyond. Finally, a summary connects the dots of the overall assessment and presents policy options and opportunities for further action.

The tool provides a qualitative assessment of crisis and conflict potential in the water sector. The information required to proceed with the assessment should optimally be obtained from a combination of desk studies and field research depending on budget and security constraints. An approach involving field research is preferred, as the information obtained in the desk studies can be validated and knowledge gaps filled through interviews carried

7 A. Houdret, et al. (2010). *The water security nexus: Challenges and opportunities for development cooperation*. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

8 See <http://www.initiativeforpeacebuilding.eu/> for the results and publications, including adelphi's case studies on natural resource cooperation and peacebuilding.

9 See <http://www.ifp-ew.eu/>

10 A. Houdret (2008). 'Scarce water, plenty of conflicts? Local water conflicts and the role of development cooperation', accessed on 4th June 2010. Available at [http://inef.uni-due.de/page/documents/PolicyBrief03\\_en.pdf](http://inef.uni-due.de/page/documents/PolicyBrief03_en.pdf)

out in the field. Water conflicts are a very challenging subject to study, as they are defined by extremely complex socio-economic and political factors. We have tried to develop the tool in a way that encourages its users to think about the variables influencing water conflicts in a broader context rather than imposing predefined factors which would undermine the complexity of the task. Depending on time constraints, the user of the framework may choose to focus their study on one of the main categories impacting the potential for conflict. This category can be selected based on the expertise of the individual or organisation wishing to conduct the assessment.

## 1.4 WHO CAN USE WACCAF?

This assessment framework was developed for actors working in the water sector or involved in crisis management activities who want to understand water conflicts and the cooperation potential of the resource. Although some prior knowledge of conflicts and water is helpful, this framework is also appropriate for people who have no prior understanding of or experience in these fields. The assessment framework is very flexible and versatile and can be used by organisations and individuals involved in water management and water development projects, or for research and academic study.

## 2. HOW TO USE THE FRAMEWORK – SCOPE AND KEY STEPS

This section includes a short introduction and overview of WACCAF. It starts by defining the scope of the framework, which describes what kind of conflicts and actors the framework addresses. Next, the basic assumptions the framework builds upon are introduced and explained. This part serves as the contextual background. In the third part, the key steps for using the framework are laid out and described.

### 2.1 SCOPE

WACCAF is a tool to analyse and understand internal<sup>11</sup> water conflicts and to develop subsequent priorities for action such as conflict-prevention efforts or conflict-sensitive development projects. The framework helps assess key variables associated with potential, evolving or ongoing water conflicts, as well as conflict resolution and cooperation potential linked to the resource. It is based on existing research, empirical evidence of water and other conflicts, and on information gathered during our field research. The framework organises this knowledge into a structure for analysis that proved to be useful in the field.

The framework addresses **conflicts between different water user and management groups** since water conflicts mostly take place between these groups (for a definition see “Basic Assumptions” below). User groups include direct water users which can be separated into agricultural, domestic and industrial users.<sup>12</sup> Water-management groups manage access and/or availability of the resource for different user groups. Box 1 gives definitions and examples of both groups.

#### Box 1. Water User and Management Groups

*Definition of water user group:* A group which uses water directly for its domestic, professional or livelihood needs.

*Usage of water includes:*

1. Using the water itself, e.g. drinking or irrigation;
2. Using the water in an industrial/commercial process creating effluence;
3. Using the water body, e.g. fishing or recreation.

*User groups include:*

1. Agricultural users like farmers, fishermen and pastoralists;
2. Industrial and commercial users, like paper mills or hydroelectric power plants;
3. Domestic water users.

*Definition of natural-resource-management groups:* A group which controls the availability and/or access to water resources. These groups and their rules can be formal, like government institutions, or informal, like local councils. There are two main management groups which play an important role in water access and availability:

<sup>11</sup> Internal water conflicts refer to water conflicts within a country.

<sup>12</sup> P. H. Gleick, et al. (2009). *The world's water 2008–2009*. Washington, DC: Island Press.

1. Water managers: Management groups which govern water availability and access directly. Examples include water service providers, government institutions, local water-management committees or traditional water-governance institutions.
2. Ecosystem managers: Management groups which govern water availability and access indirectly by managing certain ecosystems. Examples include government authorities managing wetlands or protected nature reserves.

Sometimes managers can also be water users, like an owner of a piece of land which houses a water point used by both the owner and the community.

## 2.2 BASIC ASSUMPTIONS AND CONCEPTS

WACCAF builds upon specific assumptions and concepts of water conflicts which are used throughout the framework to guide the analysis. This section introduces those assumptions and concepts and the following sections provide more specific detail and application of them. For an overview of the logic of the framework, see Figure 1.

It is important to understand that the assumptions and concepts presented here are only guidance; water conflicts, like all conflicts, are very complex and context specific. This means that the user of the framework must be aware that there may be cases which deviate or do not fit neatly into WACCAF.

### SOURCES OF WATER CONFLICT

First, the framework rests upon the assumption that competition between different user and management groups over water access or availability can turn into conflict. There is no automatism and the likelihood of conflict depends on a variety of factors, but there are certain combinations of factors which seem to be more important. Research suggests that, if **unequal water access and/or availability** affects already **marginalised groups**, it can exacerbate existing tensions and make a community more prone to conflict.<sup>13</sup> At the same time, conflict prevention and transformation can use this entry point by reinforcing marginalised groups and combating root causes of conflict.<sup>14</sup> Thus, these two concepts, unequal water access and availability and marginalisation, are important for our analysis.

### WATER ACCESS AND AVAILABILITY

User groups need to access water to be able to use it or the resources it contains, e.g. fish. Access points to water can include water taps, boreholes and river banks.

Water availability describes the water which can be used, and it can be influenced by impacting the quantity and/or the quality of water. For example, there might be enough water available (quantity) but it may be polluted (quality) and therefore not available for certain uses.

In many cases, issues beyond water access and availability play a role in water conflicts. For example, pastoralists might destroy gardens and fields while accessing water with their big herds, and further conflict may arise over the destruction caused. This is a good example of the complexity of water conflicts and the need to also look beyond this framework.

13 J. Gehrig and M. M. Rogers (2009). *Water and conflict: Incorporating peacebuilding into water development*. Catholic Relief Services, accessed on 4th June 2010. Available at <http://www.indiaenvironmentportal.org.in/files/waterconflict.pdf>; A. Houdret, et al. (2010). Op. cit.; A. Houdret (2008). Op. cit.; A. Richards (2002). *Coping with water scarcity: The governance challenge*. San Diego: Institute on Global Conflict and Cooperation; E. Lecoutere, B. D'Exelle and B. Van Campenhout (2010). Op. cit.

14 D. Bloomfield, M. Fischer and B. Schmelzle (2006). *Social change and conflict transformation*. No. 5. Berlin: Berghof Research Center for Constructive Conflict Management. Available at [http://www.berghof-handbook.net/documents/publications/dialogue5\\_sochange\\_complete.pdf](http://www.berghof-handbook.net/documents/publications/dialogue5_sochange_complete.pdf); G. Bächler (1994). *Desertification and conflict. The marginalization of poverty and of Environmental Conflict*, *Environment and Conflicts Project (ENCOP)*, Occasional Paper 10. Zurich/Bern: ETH Zurich/Schweizerische Friedensstiftung.

## MARGINALISATION

The second important concept is marginalisation of certain social groups, defined as certain individuals or groups being excluded from economic, social and political means of promoting self-determination.<sup>15</sup>

## DEFINING WATER CONFLICTS

Defining conflicts can be its own science. Two broad but helpful definitions of conflict are:

*'Conflict is a relationship among two or more parties, whether marked by violence or not, based on actual or perceived differences in needs, interests and goals'.<sup>16</sup>*

*'A conflict arises when parties disagree about the distribution of material or symbolic resources and act on the basis of these perceived incompatibilities'.<sup>17</sup>*

To better understand water conflicts, the following section includes important characteristics and an explanation of the conflict escalation chain, which shows how a water conflict can play out and manifest itself. Note that the steps of the escalation chain do not always play out in this order and, for this analysis, any one, some or all of the steps constitute a conflict.

As mentioned above, water conflicts involve water issues but are rarely restricted to those issues alone, and often involve other issues, such as past conflicts or socio-political or economic interests.<sup>18</sup>

## FORMS OF WATER CONFLICT

Water conflicts often manifest themselves at first *verbally* (e.g. protests or diplomatic complaints) and conflict groups refer to established formal or informal institutions.

*Confrontations* entailing damage of infrastructure, riots or breaches of agreements may result if no agreement can be reached in due course.

*Violent escalation* of the conflict depends on a number of factors, such as the socio-political and institutional environment, as well as the existence of previous conflicts.<sup>19</sup>

Thus, we have a wide conflict definition which includes:

- Verbal exchanges and (diplomatic) tensions;
- Confrontations, such as riots, damage to infrastructure and breaches of agreements; d
- Violent escalations.<sup>20</sup>

## CRISIS AND CONFLICT POTENTIAL

The framework helps assess the crisis and conflict potential in a given region. The variables that underlie conflicts are many and the dynamic relationships between them are often not well understood. It is therefore difficult to quantify these variables and create a tool capable of scaling the probability for conflict. WACCAF aims to reveal how key variables and factors can influence the potential for crisis and conflict. On the basis of this understanding, concrete options for policy intervention and conflict-sensitive development can then be formulated.

15 M. Burton and C. Kagan (2005). 'Marginalization'. In G. Nelson and I. Prilleltensky (Eds.). *Community psychology: In pursuit of liberation and well-being*. Palgrave Macmillan. Ch.14, pp.293–308.

16 K. Means, et al. (2002). *Community-based forest resource conflict management. A training package*. FAO-Rome: Food and Agriculture Organization of the United Nations, p.9. Available at <http://www.fao.org/DOCREP/005/Y4300E/Y4300E00.HTM>

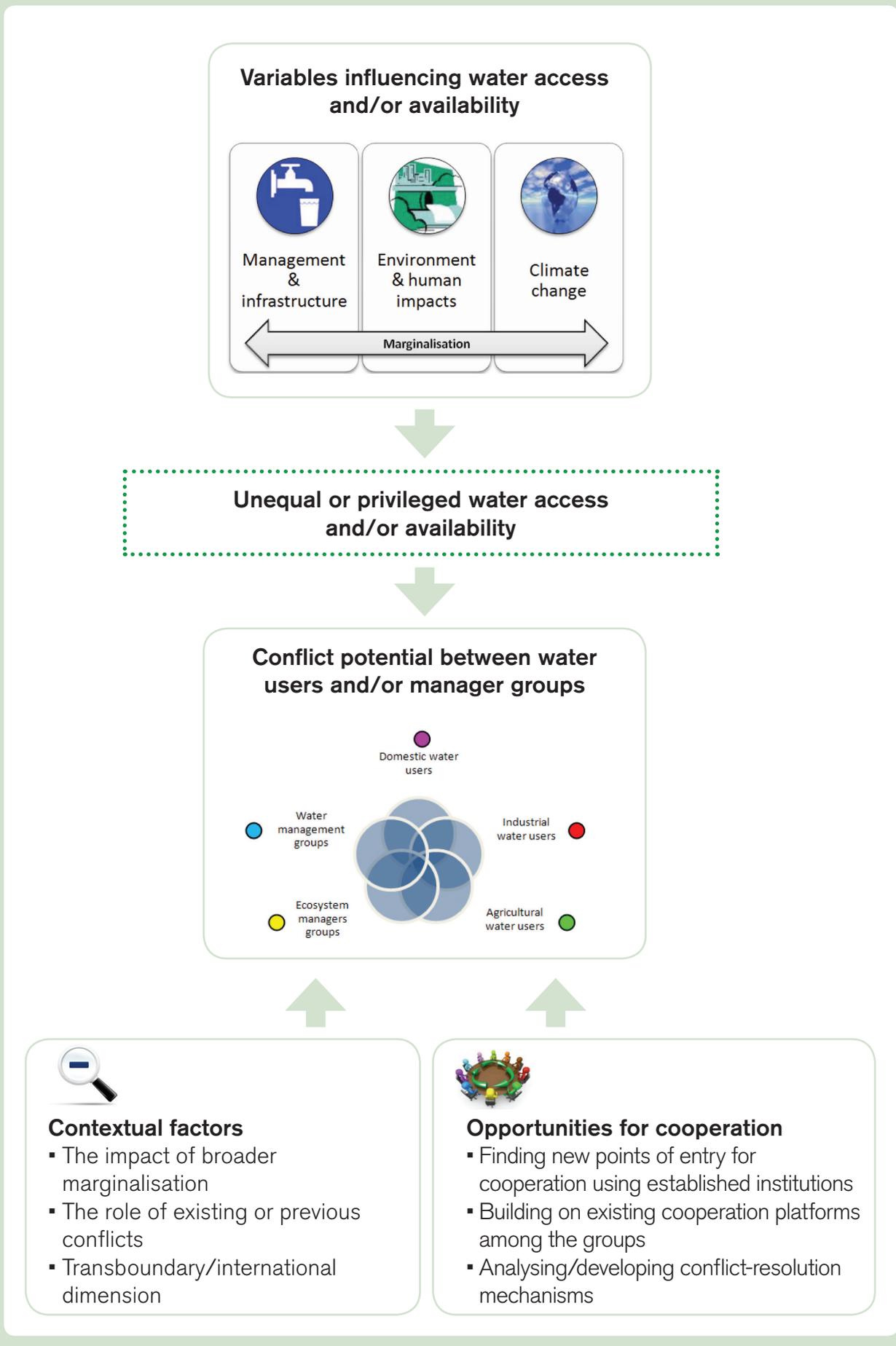
17 International Alert (1996). *Resource pack for conflict transformation*, Section 1. London: International Alert, p.3.

18 P. Tamas (2003). *Water resource scarcity and conflict: Review of applicable indicators and systems of references*. Paris, France: UNESCO. Available at <http://unesdoc.unesco.org/images/0013/001333/133307e.pdf>

19 Y. Yasmi, H. Schanz and A. Salim (2006). 'Manifestation of conflict escalation in natural resource management', *Environmental Science & Policy*, Vol. 9, No. 6, pp.538–46.

20 A. Houdret (2008). Op. cit.

**FIGURE 1. THE WATER, CRISIS AND CLIMATE CHANGE ASSESSMENT FRAMEWORK (WACCAF)**



## 2.3 HOW TO USE THE ASSESSMENT FRAMEWORK

The preferable approach to using the assessment framework is a combination of desk study and field research. Normally, the starting point of any assessment is an extensive desk study phase in which all relevant literature is screened and analysed. Based on these findings, priorities for field research, such as geographical hot spots, target groups and problem constellations, are identified. The goal for the field research is to close knowledge gaps and confirm or refute important findings of the desk-study phase. The results may require further analysis of new aspects which have not been considered before. The findings of the field research and the desk studies are then combined into a final assessment. As the field research activities will include interviews, Box 2 provides tips for conducting these in a sensitive setting.

The following sections provide a structure for your analysis. Each section is one step of your analysis and starts out with a short description of how to proceed. It continues with a general explanation and introduction to all important concepts and factors. It also provides a guiding question, a possible output and, at the end, a set of more detailed questions and tools to give you guidance for your research.

### Box 2. How To Do Interviews?

Interviews are an essential part of field research, but talking to people involved in and affected by water conflicts can have its own challenges. Here are some tips on how to avoid some of the pitfalls.

- **Speak the other's language:** It is important to understand the concepts and structure of the framework, but when talking to people on the ground try not to impose these concepts and structures on your interviewee. You will have to translate the concepts of WACCAF into a language the interviewee understands – both methodologically and verbally. Also, be careful not to impose your assumptions or the assumptions made in WACCAF. Be open to answers which do not support your assumptions and try to understand the interviewee's own framework of understanding. You can prepare for this by understanding who you will talk to and anticipating certain issues which will be hard to find out or talk about. For example, government officials might not be willing to talk about negative effects of their policies.
- **Find the right words:** Talking about conflict and/or marginalisation is not easy. Often people are afraid. Sometimes they want to omit their own wrongdoing. Members of marginalised communities can also be shy and not used to talking to strangers. Finally, people are often not aware that there is a conflict or that they are marginalised or marginalising other groups. If you have the impression that you are in one of these situations, try to express yourself in a careful way and ask questions which give you the information you need without using those concepts. Confronting people with overly direct assumptions or expressions may provoke negative reactions and people will either not answer or lead you in a wrong direction. For example, instead of asking if there are conflicts around water, ask more specifically about possible manifestations of these conflicts, such as people fighting over water or about certain grievances towards other groups or water polluters or consumers. Approach marginalisation the same way: instead of asking if one group is marginalised, ask if certain groups have less money or are poorer or have a different position in decision-making processes.

#### Some quick tips for interviews:

1. Carefully choose your interview partners so that you cover a wide range of stakeholders in your survey. Write down a list of questions before the interview and prioritise them.
2. Do not pose yes or no questions. Try to ask leading questions such as "How does water scarcity affect you?" rather than "Does water scarcity affect you?" Responses to leading questions will provide more detail and support for your research.
3. Do not pose biased questions such as "Don't you think that water users are polluting the river?" Instead, give the interviewee the opportunity to explain their point of view on the topic by asking "Which problems of water pollution do you face?"
4. Refer to other situations you came across in the field to show your knowledge of the local context and get feedback on the information you obtained.
5. To check the responses, summarise the answers of your interviewee so they can correct you or add more detail.

The next part of the introduction will briefly describe the different steps of the analysis and explain how they will build upon each other.

### STEP 1: CHOOSING A REGION AND/OR CONFLICT

This first step does not have its own section, but is only described here. It helps you define the scope of your assessment. The key questions you should answer before you start are the following:

#### Answering the where

Since you want to use this framework, chances are high that you have a specific case or region already in mind. To start your assessment, you have to choose a region and/or conflict you want to analyse. Keep in mind that the scale of analysis (local, regional, basin-wide crisis, etc.) also depends on your available financial and time resources.

#### Answering the why

Next, try to identify the main reasons why you wish to conduct this analysis and why you think this assessment is relevant for the selected region.

Here are some guiding questions which might help you with your decision:

- For donors or development organisations: What are the key regions and issues your organisation is focusing on? Which of these regions currently have “hot” issues and where can you build upon local partners?
- For academia: Where are pre-existing (water) conflicts or manifestations of (water) conflicts?

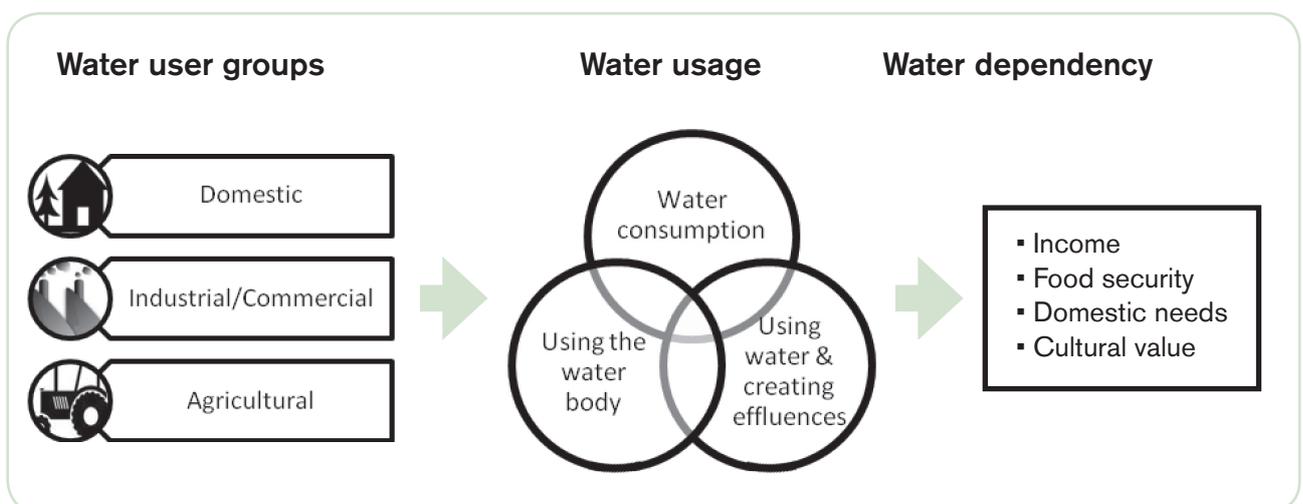
#### Answering the what

The choice of your subject of analysis should depend on your research interest and the available resources. Try to make your topic of analysis as specific as possible. This will help you focus your research and use the available resources more efficiently.

#### Answering the who

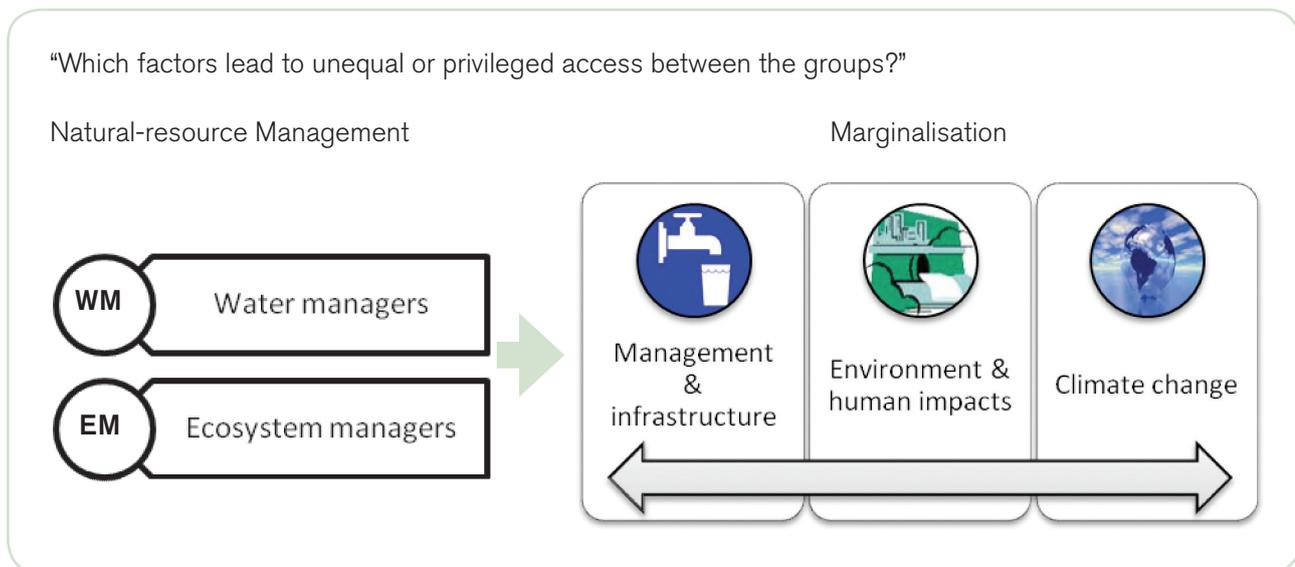
In order to carry out your research, you will have to develop a local network of contacts to help you gather information. Try to identify those with whom you can collaborate in your research and, if necessary, with which institutions you can develop a partnership.

### STEP 2: IDENTIFICATION OF USER GROUPS (SECTION 3)



The starting point for our assessment of water conflicts is the tension between different user and management groups. Thus, after choosing the region and/or conflict, the important water-user groups have to be identified (management groups will be identified in the next step). This step of the analysis also entails a first assessment of how those groups depend on water for livelihoods since this can have an influence on conflict and cooperation potential.<sup>21</sup> The output of this step is a first list of actors and their water dependency. This list is part of actor mapping which will continue throughout the next steps. Actor mapping is explained in section 3.

### STEP 3: ANALYSIS OF WATER AVAILABILITY AND ACCESS (SECTION 4)



The next step is to analyse water access to and availability for each user group. The main part of your analysis is to understand why different user groups have unequal access to water and/or unequal availability of water, and the role marginalisation in regard to water plays. Thus, two of the main factors which influence conflict potential – unequal access and/or availability and marginalisation – are analysed. After a general introduction into unequal access and availability, marginalisation and conflict potential, this section is divided into three broad categories of factors which are important to water availability and access:

- The role of water management and infrastructure;
- The environment and human impact;
- The role of climate change.

### STEP 4: ANALYSIS OF THE BROADER CONTEXT (SECTION 5)

- Broader marginalisation
- Existing or previous conflicts
- Transboundary/international dimension



As a next step, we look at the broader social, economic and cultural context, more specifically at factors which are known to increase the likelihood of conflict. This will help you put the findings from step 3 into a broader perspective. First, this concerns the interplay between unequal water access and availability and broader marginalisation of certain groups. Second, the history of conflict, such as pre-existing conflicts or tension between certain groups, is considered. Third, the international dimension of water conflicts is taken into account.

<sup>21</sup> P. Moore (2010). *Sustainable livelihoods, environmental security and conflict mitigation*. Washington, DC: The World Conservation Union (IUCN). Available at [http://cmsdata.iucn.org/downloads/061221\\_ls\\_final.pdf](http://cmsdata.iucn.org/downloads/061221_ls_final.pdf)

## STEP 5: IDENTIFICATION OF COOPERATION, CONFLICT-RESOLUTION AND PREVENTION POTENTIAL (SECTION 6)

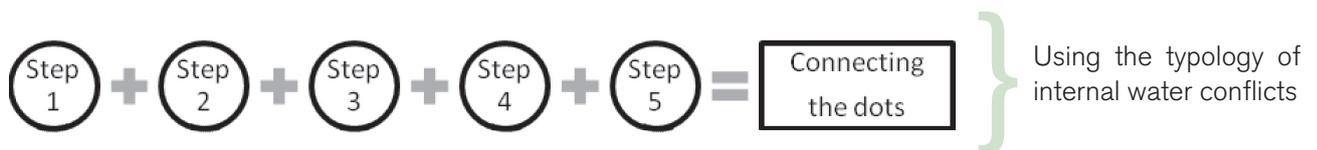
- Finding new points of entry for cooperation using recognised institutions
- Building on existing cooperation platforms among the groups
- Analysing/developing conflict-resolution mechanisms



The next step is to analyse the cooperation, conflict-resolution and/or conflict-prevention potential between certain groups. This part links the assessment framework to recommendations of how to decrease the conflict potential, since means for conflict resolution and cooperation are potential entry points for action.

## STEP 6: CONNECTING THE DOTS (SECTION 7)

The last step is to connect the dots of the analysis. Since all water conflicts are very specific and different, a typology of water conflicts is introduced. Each type of conflict is explained and followed by an overview of how this type of conflict fits into the different factors and concepts outlined in sections 3 to 5 of the assessment framework. This typology can help you recognise patterns and understand the interplay of the different factors defining the likelihood of conflict. In the end, it is the user of this framework who has to connect the dots and analyse the subsequent conflict and cooperation potential.

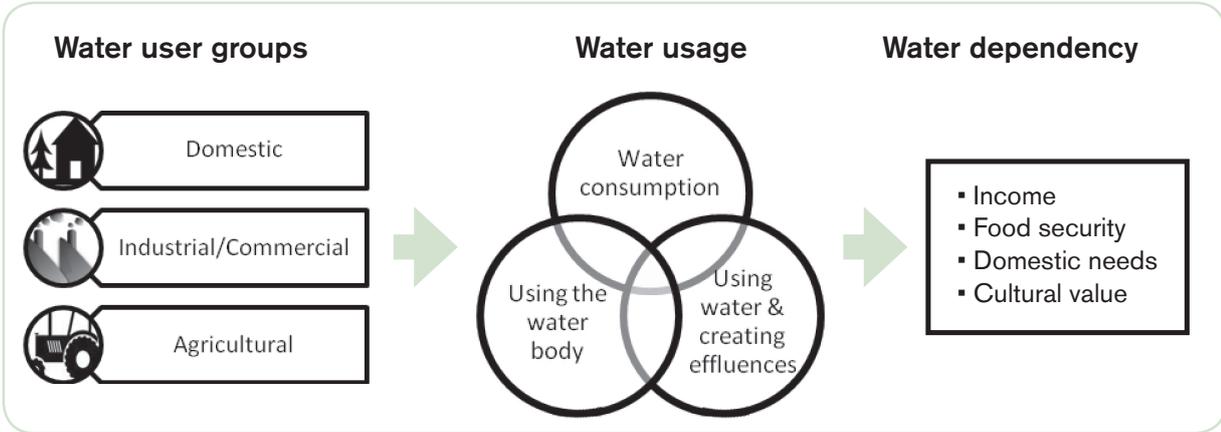


**FIGURE 2. OVERVIEW OF WACCAF METHODOLOGY**

**Step 1: Choosing a region and/or conflict**

Answering the where, why, what and who?

**Step 2: Identification of user groups**

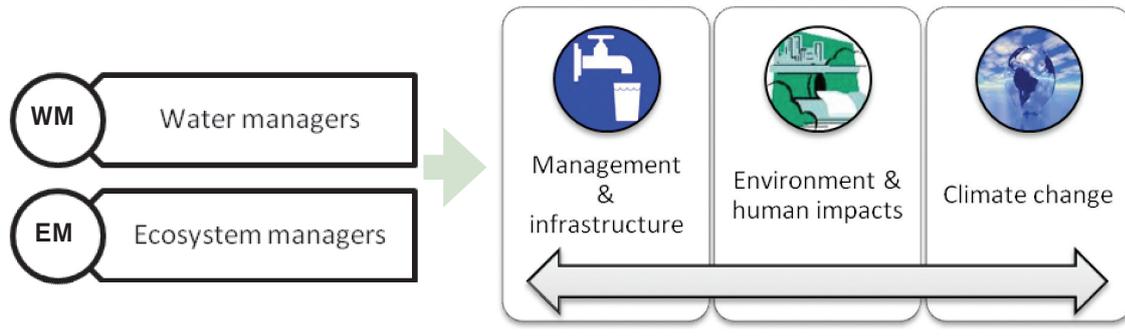


**Step 3: Analysis of water availability and access**

“Which factors lead to unequal or privileged access between the groups?”

Natural-resource Management

Marginalisation



**Step 4: Analysis of the broader context**

- Broader marginalisation
- Existing or previous conflicts
- Transboundary/international dimension

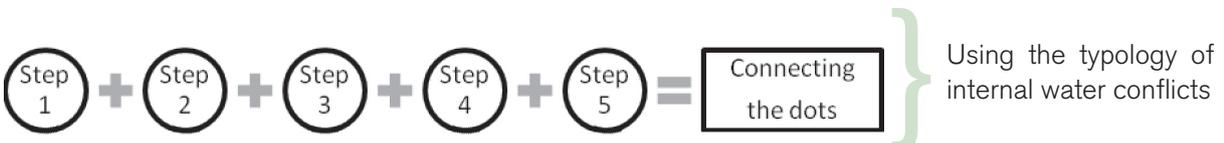


**Step 5: Identification of cooperation, conflict-resolution and prevention potential**

- Finding new points of entry for cooperation using recognised institutions
- Building on existing cooperation platforms among the groups
- Analysing/developing conflict-resolution mechanisms



**Step 6: Connecting the dots**



### 3. IDENTIFICATION OF WATER USER GROUPS

 **Guiding question:** Who are the different water-user groups and how do they depend on water resources?



**Output:** A list of user groups including information on how they depend on water.

#### How to proceed

After choosing a region or conflict, the next step is to identify the user groups. This is just a preliminary identification and more user groups might be identified during the assessment.

In this section, you should only start with the water users you are aware of and analyse how they depend on water. The relations between and among the different groups will be analysed in the next section. Water-management groups will be identified in the next section. Be aware that most groups, although they might seem to be homogenous, have quite divergent views and interests. As a result, it sometimes makes sense to split these groups into sub-groups for the analysis.

The output of this section will be a first list of user groups and their dependency on water. This will give you an initial indication of the vulnerability of the different user groups. The assessment of water dependency and its relevance will be explained in the following section.

#### Water Dependency of User Groups

Different user groups depend differently on water for their livelihood. This dependence interacts with conflict potential, as higher dependence may indicate higher potential for conflict if not enough water is available or accessible.<sup>22</sup> However, as with other factors fuelling conflict, there is no automatic link between dependence on water and conflict. It is always the interplay of several push and pull factors that determines escalation or cooperative outcomes.

The following factors are important when assessing the extent of a user group's dependency on water:

- *Income:* Many user groups are directly dependent for most of their income on water, e.g. farmers. This dependence might be mitigated by alternative income streams, e.g. remittances from relatives abroad or in the city. Note that some user groups might also be employed in water-intensive sectors – such as cement or beverage factories – and thus be dependent on a stable water supply for their income.
- *Food security:* Many user groups do not have a regular income and thus depend on subsistence farming for their nutrition needs. Thus, their food security directly depends on the water needed to cultivate crops and feed livestock.
- *Domestic needs:* Whether living in rural or urban areas, user groups depend on water for their domestic needs, which include water for drinking and basic hygiene, among many other uses. Domestic water needs depend on many factors including climate, cultural habits, income level and lifestyle of the user group. According to the World Health Organization (WHO), 7 litres per capita per day (Lpcd) is the minimum “survival” allocation which can be sustained only for a few days. Medium-term allocation (sustainable for a few months) should provide between 15 and 20 Lpcd to people in emergency settings.<sup>23</sup> For long-term water allocation standards, intermediate to optimal access should range between 50 and 100 Lpcd. The distance to access points, number of taps and water quality are also important factors to consider when assessing water supply per

<sup>22</sup> P. Moore (2010). *Op. cit.*

<sup>23</sup> B. Reed (2005). *Minimum water quantity needed for domestic use in emergencies*. Geneva: WHO and Water, Engineering and Development Centre (WEDC).

capita.<sup>24</sup> Nevertheless, water shortages are felt strongly not only by the poor but also by the middle and upper classes. Although the latter groups are not impacted in their food security and have greater financial and technical means to adapt to water shortages, such as purchasing bottled water, they can perceive that their daily life is affected by water shortages in ways which are not acceptable.

Besides the material value and the importance for livelihoods, water can also have symbolic religious or cultural value for certain user groups. For example, some religions believe in spirits living in water bodies, as in Uganda where an official ceremony to “move” a spirit out of a waterfall was necessary to allow for the construction of a new dam.<sup>25</sup>

#### Questions:

- Who is using water and for what?
- How directly is the livelihood of the user group dependent on water?
- How do the different user groups perceive the impact of less water access and/or availability on their livelihood and/or lifestyle?
- Do the different water groups have alternative sources of income which are not dependent on water?
- Does water have an important symbolic value to certain user groups?

### TOOLBOX 1. LIST OF USER AND MANAGEMENT GROUPS

The following template can be used to gather and organise your information. In this part of your analysis, you will not identify all important groups and not be able to fill in all the information. The list will fill up as you go along with your analysis. Feel free to add categories you think are important.

Also, this list can serve a second purpose as the starting point for the actor-mapping tool in the next section.

User or management group	Water dependency/ water use	Impact on water availability and/or access	Translates into less or more water for
Large-scale farmers	Irrigation and domestic use	Water overuse, sinking water table	Subsistence farmers
...	...	...	...

24 G. Howard and J. Bartram (2003). 'Domestic water quantity, service level and health', accessed on 4th August 2010. Available at [http://www.who.int/water\\_sanitation\\_health/diseases/wsh0302/en/index.html](http://www.who.int/water_sanitation_health/diseases/wsh0302/en/index.html)

25 Interview with local non-governmental organisation (NGO), Uganda, 2010.

## 4. ANALYSIS OF WATER ACCESS AND AVAILABILITY



**Guiding question:** How and why do different groups have privileged or unequal water access and/or availability?



**Output:** An analysis explaining privileged or unequal water access and/or availability of certain user groups, the role marginalisation plays and what that means in regard to the conflict potential.

### How to proceed

After the user groups are identified, the next step is to analyse the water availability and/or access of each group and understand how and why some groups have privileged or unequal water access and/or availability. As part of this analysis, you might find new user or management groups. In this case, you should also analyse their dependence on water. A special focus will be placed on the role of marginalisation in regard to water. These two points – **unequal water access and/or availability** and **marginalisation** – are central to understanding ongoing water conflicts, as well as conflict and cooperation potential.

Water access and availability of different user groups is dependent on a number of variables, grouped into three broad categories of factors:

1. The role of water management and infrastructure
2. The environment and human impact
3. The role of climate change

Most of the time the three sets of factors interact and more than one set of factors determine water access and availability. Accordingly, you should decide if you are going to analyse all of those categories or just choose the ones you think are needed for your assessment.

In this section, each of these categories of factors is explained separately with a special focus on how water access and availability interact with marginalisation. Certain key concepts will be explained as they appear. In addition, the end of each section contains a list of specific questions for that category.

During your analysis of water access and/or availability, you might also come across manifestations of the conflict itself, such as protests, verbal exchanges and instances of violence. Note them down, as they will be analysed in detail in section 5.2.

The following section provides a general introduction to unequal water access and/or availability and marginalisation. It highlights some important points and concepts for your analysis. After this general introduction, the three sets of factors – more specifically, how they can impact water access and/or availability and how they interact with marginalisation – are explained.

At the end of this section, there is an actor-mapping tool that may help you to visualise and better understand the complex interactions between the different user and management groups and water resources.

## 4.1 UNEQUAL WATER ACCESS AND/OR AVAILABILITY, MARGINALISATION AND CONFLICT POTENTIAL

In this part of the analysis, we are interested in cases which led to unequal water access and/or availability of different water users. Privileged water access and/or availability becomes a problem if it translates into less water for another user group and that situation is **perceived as unjust or unequal**.<sup>26</sup> For example, an industrial factory located upstream has privileged water access and pollutes the water for downstream users. This situation can become a source of conflict if the downstream users are dependent on the same resource for their domestic needs or livelihoods and are aware of the cause of pollution or decreasing water availability.

Sometimes perceptions can also be wrong. A group may perceive that their water supply is influenced by another group, while, in fact, the water scarcity is caused by a different factor. But, as with objective causes of unequal access or availability, even perceived causes can fuel grievances. They both determine the attitude of the parties towards the resource and its access, and may thereby lead to changing behaviour towards the other group, including tension and conflict.<sup>27</sup>

Often user groups are not aware that other groups actually have an impact on “their” water, especially if those users have low levels of information or environmental awareness, such as a polluter or water consumer located far upstream from deleterious downstream impacts. In this situation, conflict is unlikely as it is difficult for the affected user group to draw links between the cause of their restricted water access or availability.

Unequal or privileged access to water or less water availability often goes hand in hand with broader political and/or socio-economic marginalisation of certain social, ethnic and/or religious groups, and a certain group which is marginalised is also likely to be marginalised in regard to water.<sup>28</sup>

**Socio-economic marginalisation** in regard to water is often connected to the lower socio-economic status of certain groups.<sup>29</sup> Their poverty also leads to less water access and/or availability – for example, urban poor might not have the money to pay for water services or poor farmers might not have the financial and technical means to dig wells. But this is not always the case; sometimes groups with higher socio-economic status can be marginalised, such as the financially successful Indian immigrants under the dictatorship of Idi Amin in Uganda.

Socio-economically marginalised groups are also more likely to experience **political marginalisation**. They are not fully integrated into decision-making processes, may not have voting rights and may have only limited access to the means to express their opinions and concerns in the political system. Their socio-economic marginalisation weakens their negotiation positions as well as their formal and informal rights to claim access to water or influence other groups to stop impacting water availability. Marginalisation influences the overall discontent and may encourage conflictive behaviour.<sup>30</sup> On the other hand, socio-economically and politically stronger groups, such as large-scale farmers, can more easily secure their water supply as they have stronger positions which can translate into political influence, corruption and important financial means to ensure water access and availability.<sup>31</sup> In addition, this stronger position often allows them to influence water access and availability to other groups by, for example, supporting legislation that favours big polluting industries. Socio-economically stronger groups often have more political power. Thus, water access and availability is often part of the broader social context of socio-economic status and political power, which needs to be taken into account when analysing water conflicts.

In this situation, unequal access to water or impacts on water access and availability may feed into already existing cleavages and grievances to the extent that tensions and the likelihood of conflict increase. Inequality not only triggers conflict but often also leads to stronger group identities both in the marginalised and in the more powerful

26 J. Gehrig and M. M. Rogers (2009). Op. cit.

27 Ibid.

28 UNDP (2006). Op. cit.

29 World Water Assessment Programme (2006). *Water: A shared responsibility*. Berghahn Books.

30 V. Dudouet, B. Schmelzle and D. Bloomfield (2005). *Theories of social change and their contribution to the practice of conflict transformation: Developing the state of the art in conflict transformation theory and practice*. Berlin: Berghof Research Center for Constructive Conflict Management. Available at <http://www.berghof-conflictresearch.org/documents/publications/br11e.pdf>

31 A. Houdret, et al. (2010). Op. cit.

groups. These group identities resulting from marginalisation can serve as an important mobilisation resource and strategy in conflicts, especially when they turn violent.<sup>32</sup> As with unequal water access and availability, in some cases, marginalised groups are not aware that they are marginalised. In this case, their marginalisation will probably not increase conflict potential. Thus, as research on environmental security has shown, there is no automatic link between resource degradation and conflict or marginalisation and conflict. Conflict is always created by a specific set of intervening factors interacting with resource degradation and marginalisation.<sup>33</sup>

## 4.2 THE ROLE OF WATER MANAGEMENT AND INFRASTRUCTURE

Water is often managed by **formal and/or informal institutions**. Formal water-management institutions can be, for example, national, regional or local state water-management authorities or public and private water service providers. Informal water-management institutions may include traditional institutions such as religious councils or leaders controlling water allocation or traditional irrigation communities. These institutions decide about the rules and priorities of water allocation to the different users. They often also build and maintain water infrastructure. If water is not a free service, they may also collect tariffs.

Water **governance** by these institutions can lead to unequal water access and availability. The choice of a certain type of infrastructure, allocation patterns or conflict-resolution mechanisms may favour specific groups. The technical, managerial and financial capacities of these institutions are crucial for improved allocation plans and sustainable use of the resource among users. For example, agricultural water supply is often not taken into account in urban planning and by water-management authorities. The fact that infrastructure can be set up in a way that later can lead to conflicts shows the importance of thorough planning.<sup>34</sup>

### Box 3. Conflict-Sensitive Water Project in Uganda

Saferworld and its local partners in Uganda built a system to share water between two villages using a gravitational flow scheme. The system drew water from a source located near a village higher up in the mountains and used gravitational force to distribute the water to the lower village in the valley. The region had suffered from a history of violent conflicts over ethnicity, creating significant tensions between the two groups.

Having learned from past experiences and considering existing tensions, a conflict-sensitive approach was used to prevent new water conflicts. The conflict potential of setting up new infrastructure became quickly apparent, when discussions over the distribution of the water taps turned into heated debates among the groups. Both groups, feeling marginalised and underrepresented with little access to resources or jobs, fought intensively in order to secure their access to water. Throughout the project, it was crucial to keep the planning of the infrastructure – such as pipe layout, tap distribution and reservoir placement – transparent in order to create project ownership and reduce tensions among the groups. Other concerns, such as landowners claiming rights to the water when the water pipes passed through their land, had to be taken into account and addressed through all phases of the project to minimise the conflict risk.

Following the design and construction phases of the project, the next important step was to establish a management committee that would ensure long-term sustainability of the project. In order to reduce the perceived injustices between the groups and minimise the potential for conflict, it was important that the managing committee included a representative from all groups and that transparency was respected in all steps of the operation and maintenance activities. This became especially important when tariffs began to be collected. For example, concerns increased when the opening of a planned bank account was delayed and the responsibility of holding the capital contributions was temporarily transferred to the committee's treasurer.

32 UNDP (2004). *Human development report: Cultural liberty in today's diverse world*. USA: Oxford University Press.

33 G. Bächler, K. Spillmann and M. Suliman (2002). *Transformation of resource conflicts: Approach and instruments*. Bern: Peter Lang Publishing/European Academic Publishers.

34 K. Harris (2008). *Water and conflict: Making water delivery conflict-sensitive in Uganda*. Saferworld, CECORE, REDROC, YODEO. Available at <http://www.gsdr.org/go/display&type=Document&id=3575>

Concerns were also raised when the water tariff per head at a tap was determined without following the initially agreed protocol. The committee was supposed to divide the overall tap tariff by the number of users to determine the tariff rate, but in this case the tariff rate was determined without counting the total number of users. These points illustrate how important a functioning and transparent management institution is to a conflict-sensitive and sustainable water supply scheme.

Saferworld and its local partners showed that, if a conflict-sensitive approach is applied through the different phases of a water project, a conflict situation can be avoided and all groups depending on the water resource can benefit from the added value of the infrastructure.<sup>35</sup>

Water management is always embedded in socio-political structures. Therefore, water governance institutions may mirror **socio-economic and political marginalisation**. Decisions over allocation consequently tend to follow specific and not necessarily objective priorities of the decision-makers because 'economic and hydrological interactions are further embedded within cultural and social contexts that eventually define the distribution of costs and benefits within the society, and are thus highly political in character'.<sup>36</sup> This is particularly obvious in the case of traditional irrigation communities and their formal and informal rules for water management.<sup>37</sup> Certain user groups might not be represented or have less power in the decision-making processes of water-management institutions. For example, women are usually not represented in many of the traditional irrigation communities.<sup>38</sup> Governments on the local, regional or national level might also decide to give certain users preferred access and availability. For example, a government might decide to give more water rights to large farmers than small farmers. In urban settings, growing demand often leads to rising water prices for domestic users.<sup>39</sup> Poor families will be the first who cannot pay the higher water fees and, thus, will lose access to clean water.

**Bad governance**, like corruption, can aggravate socio-economic and political marginalisation, as more powerful and resourceful groups can more easily influence decision-making processes in this situation. Bad governance in the water sector usually translates into reduced water access and/or availability for the people most dependent on the resource.<sup>40</sup> It lets more powerful groups get around the rules and regulations in the water sector, allowing them to deplete and pollute water stocks, exploit and destroy valuable ecosystems, and steal money used to build and maintain infrastructure providing water to the poor.<sup>41</sup> Corruption is not the only driver of bad governance. For example, at the local level, the lack of financial resources and technical capacity can push people to adopt unsustainable water-management practices without regard for – or knowledge of – the long-term repercussions on the resource and the environment.

35 For more information on this project, please see K. Harris (2008). *Op. cit.*

36 F. Molle and J. Berkoff (Eds.) (2007). *Irrigation water pricing: The gap between theory and practice*. Oxfordshire/Cambridge: CABI Publishing, p.21.

37 P. P. Mollinga and J. A. Bolding (Eds.) (2004). *The politics of irrigation reform. Contested policy formulation and implementation in Asia, Africa and Latin America*. Hampshire: Ashgate Publishing Limited.

38 J. Koopman, R. Kweka, M. Mboya, et al. (2001). *Community participation in traditional irrigation scheme rehabilitation projects in Tanzania*. Dar es Salaam, Tanzania: Ministry of Agriculture and Cooperatives. Available at [http://pdf.usaid.gov/pdf\\_docs/PNACL421.pdf](http://pdf.usaid.gov/pdf_docs/PNACL421.pdf)

39 UN-Habitat (2005). 'The challenge of water and sanitation in cities', accessed on 1st July 2010. Available at <http://www.unhabitat.org/content.asp?typeid=19&catid=593&cid=6871#>

40 A. Richards (2002). *Op. cit.*; UNDP (2006). *Op. cit.*

41 Transparency International (2008). *Global corruption report 2008: Corruption in the water sector*. Cambridge University Press.

#### Box 4. Governance

Governance is a term that is often used in development literature. Major donors and development organisations are increasingly structuring their programmes and responses with the promotion of good governance as a central pillar. Governance is applicable in several contexts (e.g. corporate governance and project governance) and on several levels (e.g. local, national and international governance).

The UN Economic and Social Commission for Asia and the Pacific (UNESCAP) summarises governance as the process of decision-making and the process by which decisions are or are not implemented. These processes involve formal and/or informal actors (decision-making) and established structures (implementation). The government is an important actor for governance; however, the circle of actors also extends beyond the public sector to include the private sector and society.

Good governance guides the decision making and implementation process following a set of key principles that include participation, the rule of law, transparency, responsiveness, being consensus oriented, equity and inclusiveness, effectiveness, and efficiency and accountability. Good governance requires effective political institutions capable of using their political power responsibly to manage the state's public resources. Many also argue that democracy is essential for good governance.<sup>42</sup>

'In the United Nations' Millennium Declaration, the international community reached a consensus that good governance is not only an aim in itself, but also a key factor in attaining human development and in successful poverty reduction and peace-building.'<sup>43</sup>

An especially conflict-prone situation can occur when **water management changes**; for example, the privatisation of water services.<sup>44</sup> This situation can go hand in hand with new infrastructure, allocation patterns, management authorities or rising prices. These will all affect water access and availability and may have different impacts on the user groups including conflict.<sup>45</sup>

Conflicts may also arise if no water-management institution is in place. In this situation, any user can access the amount of water they want, which can easily lead to overuse by certain user groups (see also section 4.3 "The Environment and Human Impact"). In addition, as there is no management authority, no mechanisms for conflict resolution are in place.

#### Box 5. Privatisation of the Cochabamba Water Supply

In 2000 violent protests erupted in the Bolivian city of Cochabamba in response to the privatisation of the public water supply. The government had been pressured by the World Bank and other international organisations to privatise its water services in order to be eligible for the renewal of an important loan supporting the country's economic recovery. Shortly after the state signed a 40-year concession contract handing over its water supply agency to Aguas Del Tunari, an international private water consortium, water rates dramatically increased to support restoration of the existing deteriorating water system and expansion of network coverage.

Following the sharp increase in drinking-water tariffs, consumers felt they were paying more for the same poor service and responded with demonstrations in the streets of Cochabamba. Poor households – already suffering

42 UNESCAP (2010). 'What is good governance?' Thailand, Bangkok: UNESCAP, accessed on 6th August 2010. Available at <http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.pdf>

43 GTZ (2010). 'Good governance', accessed on 6th August 2010. Available at <http://www.gtz.de/en/themen/882.htm>

44 E. P. Beltrán (2003). *Water, privatization and conflict: Women from the Cochabamba Valley*. Washington: Heinrich-Böll-Stiftung.

45 B. Balanyá, B. Brennan, O. Hoedeman, et al. (2005). *Reclaiming public water: Achievements, struggles and visions from around the world*, 2nd edition. Amsterdam: Transnational Institute (TNI) and Corporate Europe Observatory (CEO). Available at <http://www.tni.org/archives/books/publicwater.pdf>; M. Barlow and T. Clarke (2002). *Blue gold: The battle against corporate theft of the world's water*. Toronto: Stoddart Publishing Co. Ltd.

from water scarcity left unaddressed for years by the weak water institutions – had to use a significant share of their monthly income to pay for water services. In addition, peasant irrigators opposed a law threatening their control over the existing traditional irrigation systems that were initially created by the communities to adapt to the lack of government attention and support to rural areas. Farming cooperatives also feared that the law would prevent them from drilling their own water wells and affect the informal market for water based on an ancient system of property rights. Deeply rooted in the Andean culture, these traditional systems and water rights had survived years of colonisation and discrimination from local elites and were threatened by the concession contract which granted exclusive use of water resources to Aguas Del Tunari.<sup>46</sup>

The protests rapidly grew with tens of thousands soon joining the demonstrations. While Aguas Del Tunari was not willing to reconsider its decision on the water tariffs, the conflict escalated to include violent clashes between civilians, law-enforcement officials and the military, leaving more than a hundred people injured and one person dead. Having based the protests upon unresolved grievances, protesters – feeling economically and politically marginalised – expanded their demands beyond the problems associated with the privatisation of water to include other issues, such as rising unemployment rates. The government eventually declared martial law when protesters restricted access to the city by establishing roadblocks.

The impacts of the water privatisation were felt most strongly among women. They were more vulnerable since they already suffered from gender discrimination, economic marginalisation and established hierarchies within the family. In the end, the entire family suffered the repercussions of the crisis, as women carry the responsibility of ensuring and strategising the household's supply of water.<sup>47</sup>

#### Questions:

- Which formal and/or informal water-management institutions control water access and availability?
- How do these water-management institutions control access and availability?
  - How is the water infrastructure set up and does it lead to unequal access and/or availability?
  - What are the allocation patterns and do they lead to unequal access and/or availability?
  - How are conflicting water needs addressed? For example, are there conflict-resolution mechanisms?
- Why does water management lead to unequal access and availability?
  - Are certain government policies favouring water access and availability of different user groups?
  - Do water-management institutions have the capacity and technical and financial means to provide water for all users?
  - Are the planning capacities of the water-management institutions sufficient to efficiently manage the resource and prevent or solve related conflicts?
  - Are all user groups represented in the water-management institutions or do certain groups have more influence in the decision-making processes of water-management institutions?
  - Are water prices too high for certain user groups so that their basic need for water for livelihoods and domestic supply is not secured?
  - Are there cases of corruption in the water-management institution? For example, can the water managers be bribed to gain privileged access or availability?

<sup>46</sup> E. P. Beltrán (2003). *Op. cit.*

<sup>47</sup> *Ibid.*

### 4.3 THE ENVIRONMENT AND HUMAN IMPACT

Humans can impact water resources **directly by pollution or overuse**. Population growth, urbanisation and economic development often increase pollution and water use – to the point that the resource is overused. Economic development and urbanisation are, for example, often connected to changes in lifestyle as living standards rise.<sup>48</sup> These higher living standards are mostly connected to more pollution and an increase in water consumption. But the human impact on water resources can also be **indirect via different ecosystems** which perform important functions in the water cycle.<sup>49</sup> For example, forests serve as natural water storage and filtration systems. They are also important regulators of the local climate in many regions. Cutting down these forests can, in turn, lead to changes in water quality or precipitation.

Problems primarily arise if certain groups impact or control water resources or ecosystems in a way which restricts access and/or availability for other user groups. Most of the time other factors play into this. This starts with the **physical environment** which can favour certain user groups by giving them privileged access and/or the power to influence water availability and/or water access of other user groups.<sup>50</sup> For example, upstream users can draw too much water or pollute a river, leaving not enough or only polluted water for downstream users.

The physical location of certain groups is often connected to **control over land and/or land ownership**. Certain groups can restrict access to a water resource which is on their territory, for example, an individual restricting access to their land which has a well, or a government declaring certain areas protected and thus restricting access to water. Land owners can also degrade ecosystems on their territory, which can, in turn, lead to less water for other user groups. In these cases, the boundary between land and water conflicts is hard to draw.<sup>51</sup>

#### Box 6. Jakarta's Development Policies Influence Water Access and Availability

Jakarta, the capital of Indonesia, is a megacity of 9 million people. In recent years government policies have been promoting public-private partnerships supporting intensive production industries (e.g. tea plantations) and the construction of large infrastructure projects around the city. These projects, combined with rapid urbanisation increasing the number of settlements, have been dramatically affecting the drainage capacity of the city, preventing proper water infiltration inside the soils and destroying large forest areas capable of storing precipitation water. These activities have, in turn, increased the city's vulnerability to flood, from which the poor communities ultimately suffer the most. As a result of the public-private partnerships, populations have been forced to move and settle in marginal areas. The government sees these people as "illegal" settlers and has been reducing their public service provision, including their access to water. This has forced them to settle in areas increasingly closer to river banks. Although the level of awareness to the causes and risks associated with floods and waterborne diseases is quite high among the marginalised groups, they have no choice but to resort to behaviours which further exacerbate their vulnerability. For example, because of the cuts in public services, they are forced to dump waste into the rivers, thereby increasing pollution which affects their water availability and the already poor drainage capacity of the city. In times of flooding, economically marginalised groups are forced to drink contaminated water, as they have no access to clean water and often do not have the financial means to purchase clean water.

This case shows how governance, marginalisation and environmental degradation all contribute to increasing the vulnerability of poor communities to waterborne diseases. As the marginalised groups are aware that their present state of vulnerability and their lack of water access and availability are a result of their behaviours in response to discriminating governmental policies, the potential for conflict could significantly increase as the situation further deteriorates.<sup>52</sup>

48 J. D. Sachs (2009). *Common wealth: Economics for a crowded planet*. Reprint, Penguin (Non-Classics).

49 Millennium Ecosystem Assessment (2005). *Ecosystems and human well-being: Synthesis*. Washington, DC: Island Press.

50 K. Harris (2008). Op. cit.

51 A. Houdret, et al. (2010). Op. cit.

52 P. Texier (2008). 'Floods in Jakarta: When the extreme reveals daily structural constraints and mismanagement'. *Disaster Prevention and Management*, Vol. 17, No. 3, pp.358–72.

**Governance**, informal or formal, plays an important role in regard to human impacts on the environment. Government institutions can decide on certain **policies** which aggravate or alleviate problems around water and ecosystems. For example, a government can decide that certain user groups are a priority, such as important industries or agricultural sectors, and thus privilege those user groups or it can decide to lower industrial effluence standards, leading to the pollution of water resources and rendering them unusable for the local population.<sup>53</sup> Also, a government can actively encourage certain groups to obtain land or settle in certain areas which are important for water access and availability.<sup>54</sup>

But there can also be **governance problems** such as corruption, lacking capacities or failure to implement legislation. This often aggravates pollution, water overuse and ecosystem degradation.<sup>55</sup> In that situation, more powerful user groups can easily not abide by regulations. It is important to understand how underlying **socio-economic and political marginalisation** interacts with environmental factors. In the case of land, ownership is often based on formal or informal land-tenure systems. These tenure systems can mirror the marginalisation of certain groups.<sup>56</sup> For example, certain powerful groups can simply have more financial and political means to acquire land or they might be able to misuse existing institutions through corruption. Sometimes, better socio-economic status also allows these groups to better adapt to water scarcity or even gives them the means to access water. For example, there are cases where overuse by farmers has led to a drop in water tables. In this situation, farmers have to dig ever deeper wells to access water. Deeper wells are more expensive and only farmers with enough capital can afford this. Poor subsistence farmers with not enough capital are left without water.<sup>57</sup> Sometimes, governments also provide financial and technical support only to certain groups.

### Box 7. Water Conflicts and Extractive Industries

Mining operations can have significant impacts on water availability. Unsustainable water usage in processes associated with the extraction of the valuable minerals can affect the quantity and/or the quality of the water consumed by communities living downstream of the affected watershed. Water contamination usually occurs when by-products such as cyanide, mercury and acids are released into waterways, destroying important ecosystems and posing serious threats to human health. Severe impacts on human and environmental health can fuel tensions and lead to violent conflicts, if environmental awareness within the affected communities is high.<sup>58</sup>

Peru has a long history of mining conflicts. Unsustainable mining practices have caused several conflicts within the country, including violent conflicts resulting in the killing of community leaders and environmental activists. The escalation of conflict is often driven by government policies favouring the rapid expansion of the industry monitored by weak state regulation that, in turn, encourages corporations to adopt poor environmental practices. The Department of Piura is particularly vulnerable to conflicts linked to poor governance. The region is productive mainly because of irrigation systems channelling water from the Andes to fields growing agriculture exports and domestic food. Poor peasants securing their livelihoods on subsistence farming and off-farm labour live in the highlands of the region. In 2007 Monterrico Metals began mining operations in the highlands, quickly leading to severe conflicts. Farmers, environmental activists and international actors joined the protests about impacts of the planned operations on water availability. Two farmers were killed in the protests. The conflict led to a referendum in which 90 percent of citizens voted against the mining project. Following the referendum, mine workers worried about their job security, creating a divide among the poor within the community. In the end, the central government and the company used their political power to continue mine operations, neglecting the concerns of the marginalised communities. With all parties having lost trust in each other, the potential for conflict is likely to remain high. A way forward in building peace would be to establish a transparent, formal and external programme monitoring and communicating the impacts of the mine operations on the region's water supply.<sup>59</sup>

53 R. Meinzen-Dick and P. P. Appasamy. *Urbanization and intersectoral competition for water*. Woodrow Wilson International Center for Scholars. Available at <http://www.wilsoncenter.org/topics/pubs/popwawa3.pdf>

54 J. Gehrig and M. M. Rogers (2009). Op. cit.

55 UNDP (2006). Op. cit.

56 H. M. Amman and A. K. Duraiappah (2004). 'Land tenure and conflict resolution: A game theoretic approach in the Narok District in Kenya', *Environment and Development Economics*, Vol. 9, No. 3, pp.383–407.

57 A. Houdret, et al. (2010). Op. cit.; A. Houdret (2008). Op. cit.

58 J. Gehrig and M. M. Rogers (2009). Op. cit.

59 A. Bebbington and M. Williams (2008). *Water and mining conflicts in Peru*. Mountain Research and Development, Vol 28, No 3/4. Available at [http://snobear.colorado.edu/Markw/Research/08\\_peru.pdf](http://snobear.colorado.edu/Markw/Research/08_peru.pdf)

*Questions:*

- What are the major impacts of humans on the environment with regard to water?
  - What are the direct impacts, e.g. pollution and overuse?
  - What are the indirect impacts, e.g. ecosystem degradation?
- How is this impact connected to the physical location of certain groups?
  - Are there upstream-downstream constellations of user groups and how are they affected by the changes?
  - Do certain groups control or have land ownership of certain ecosystems or water resources which put them into a privileged position or give them the opportunity to impact other groups?
- What is the level of environmental awareness of the different groups?
  - Are they aware of their impact on the environment and the consequences for water access and availability?
  - Are impacted user groups aware of the impact other groups have on their water access and availability?
- Why do certain groups have control and/or land ownership which allows them to impact water access and availability for other user groups?
  - What role does governance – formal or informal – play, for example, on land-tenure systems?
  - How do government policies affect nature conservation or settlement policies?
- How do government policies impact water overuse and/or pollution?
  - Is there relevant environmental legislation and regulation, such as water quality standards, and are they being implemented?
  - Which development and/or economic policies have an impact on overuse and/or pollution of water resources?
- How do these governance systems and policies exclude or privilege certain groups in regard to water?
  - How do certain groups profit more from governance systems and policies?
  - Why do certain groups have more influence on important policies and or governance institutions, formal or informal?
  - What role does the socio-economic status of the different groups play?
- How are governance problems, e.g. corruption and lacking capacities, aggravating impacts on water or ecosystems?
  - Why is environmental legislation and regulation not implemented?
  - Are there cases of corruption with regard to pollution or overuse?
  - Are there cases of corruption around land and water resources?
- Do certain groups have more impact on water access and/or availability because of better financial and technical means?
  - Are there difference in the scale of operations of different user groups, e.g. large-scale and small-scale farmers?
  - What role do government support schemes play, such as certain groups which receive subsidies to support their access to water?

## 4.4 THE ROLE OF CLIMATE CHANGE

Global warming caused by anthropogenic emissions is likely to change the earth's climate. The increasing energy trapped on earth as a result of the greenhouse effect could accelerate the processes by which water is transferred within our climate system. Hydrologic studies predict, among other things, that the intensification of the water cycle caused by global warming will cause substantial changes in precipitation patterns, intensity and extremes. This may lead to an increase in extreme climatic events, such as droughts, floods and storms. In addition, scientists predict that higher surface temperatures will accelerate the widespread melting of snow and ice reserves and contribute to rising sea level. These changes could significantly impact the water access and availability of different user groups.

At a global level, global warming is expected to cause higher mean **precipitation**. More rainfall and snowfall will occur worldwide and precipitation patterns are likely to change – especially in regard to frequency, duration, intensity and geographic distribution. This will have direct impacts on water availability on farmers who, for example, depend on rain-fed agriculture. The changes in precipitation could also lead to increased frequency, duration and intensity of drought events and/or extreme weather events, such as storm surges and floods. These events can also affect water access and availability in multiple ways – for example, intense rainfall can increase the concentration of pollutants washed into waterways.

In cold and/or mountain climates, the **melting of snow cover and land ice** is expected to impact the timing and discharge rate of river flows. For example, more water could flow in rivers and streams earlier in the spring, leading to less water at an earlier stage of the summer season. The accelerated melting of snow cover combined with more precipitation due to higher temperatures could also increase the risk of floods.

### Box 8. Glacier Melt Multiplying Conflict Risks

The Himalayan glaciers have been commonly referred to as the “third” pole. They are a crucial resource to many as they supply freshwater to one-sixth of humanity in the densely populated surroundings of Central Asia.<sup>60</sup> During the 20th century, with the exception of one or two decades around the 1970s, glacier retreat in the Himalayas was dominant with some areas losing between 25 and 35 percent of their total mass. The melting of Himalayan glaciers could potentially have devastating impacts on the livelihoods of nearby populations. In addition, observations have shown that glacier retreat has contributed to the formation of glacial lakes, increasing the vulnerability of local populations to glacial lake outburst floods (GLOFs).<sup>61</sup>

In India, accelerated glacial melt combined with erratic precipitation caused by climate change is impacting groundwater recharge rates. Adding the pressure of rising water demands due to population growth, these factors have translated into higher competition over the scarce resource, leading to water conflicts. Such is the case in the Vadali village of Gujarat, where water scarcity and marginalisation has led to less water availability for certain user groups. In late 2004 rich farmers from the higher caste successfully boycotted the construction of a drinking-water well that would provide relief for the entire village. As they owned farm wells on their lands, the wealthier farmers could manage their water needs without resorting to the communal well during the dry season. Their interests rested in ensuring enough water availability in the water table to provide for their livestock. On the other side, landless villagers, having no access to water wells, were forced to purchase water from these farmers which helped the higher caste further benefit from water scarcity. In this case, political, social and economic marginalisation of the landless villagers led to serious resource inequity in the village. Poor villagers from the lower castes have also been condemned to pay more for water than the wealthier castes.<sup>62</sup>

60 G. Wang (2007). 'Himalayan glacial melt', Greenpeace International, accessed on 6th March 2010. Available at <http://www.greenpeace.org/international/en/news/features/himalayan-glacial-melt/>

61 M. Zemp, et al. (2008). 'Global glacier changes: Facts and figures', accessed on 6th March 2010. Available at <http://www.grid.unep.ch/glaciers/pdfs/cover.pdf>

62 A. Prakash and R. Sama (2006). *Social undercurrents in a water-scarce village*. Available at [http://conflicts.indiawaterportal.org/sites/conflicts.indiawaterportal.org/files/conflicts\\_vadali.pdf](http://conflicts.indiawaterportal.org/sites/conflicts.indiawaterportal.org/files/conflicts_vadali.pdf)

Rising temperatures are expected to accelerate the melting of glaciers, ice caps and ice sheets. Coupled with the thermal expansion of the sea due to temperature rise, these factors will contribute to **rising sea levels**. This can increase the risk of floods in vulnerable coastal regions and lead to salt intrusions into coastal aquifers impacting water quality.<sup>63</sup>

The impacts on water availability and accessibility can be a **direct consequence** of these climatic changes – for example, when less rainwater is available due to changing precipitation patterns. However, the impacts on water access and availability can also be caused by a **series of events**. The pollution of groundwater due to a flood caused by the accelerated melting of glaciers is a good example. In this case, water availability is affected by pollution caused by a flood which, in turn, is caused by the accelerated melting of glaciers due to global warming. It is important to understand these chains of events can also be exacerbated by environmental and/or human impacts.

In fact, the consequences of climate change are often **exacerbated by environmental factors and/or human impacts**. For example, climate change can increase the number of flood events in a coastal region affecting water access and availability. However, coastal communities might have increased their vulnerability to floods by settling too close to the water or flood plains. In addition, different ecosystems perform essential functions within the water cycle and can significantly reduce vulnerability to climate change. For example, wetlands, mangroves and coral reefs reduce the impacts of floods. Forests and wetlands are important regulators of the local climate and affect precipitation. Degradation of these ecosystems increases the impacts of climate change.<sup>64</sup> Therefore, it is important to understand the interaction between the environment, human impact and climate change.

**Socio-economic marginalisation** can also increase the vulnerability of populations to the impacts of climate change.<sup>65</sup> Groups with low incomes might not have the economic capabilities to develop **resilience or adapt to climate change**. For example, if water access and/or availability are reduced due to floods, people with greater income can purchase bottled water, while poorer people might have to consume polluted water. In addition, poorer people are often dependent on one source of income for their livelihood, such as farming. If they lose this source, they do not have an alternative livelihood which could compensate. Richer people, on the other hand, often have more than one source of income and might be able to find alternative livelihoods more easily, due to higher education and financial means for necessary investments. Also, water users might not have the information on how climate change will impact their water access and availability and are, therefore, insufficiently prepared for the upcoming challenges. Climate change **mitigation** – the reduction of greenhouse gas emissions – plays only a small role for vulnerable communities living in poverty, because they are the ones contributing least to greenhouse gas emissions. Climate change adaptation, especially in regard to water, on the other hand, is crucial in reducing the vulnerability of poor and marginalised communities.<sup>66</sup> However, mitigation and adaptation measures themselves may also lead to new conflicts. For example, the construction of a dam to secure water supply or measures for demand management may end up restraining water availability for certain users.

63 B. Bates, et al. (2008). *Climate change and water*. Geneva: IPCC Secretariat; P. H. Gleick, et al. (2009). *Op. cit.*; P. Kabat and B. Bates (2003). *Climate changes the water rules: How water managers can cope with today's climate variability and tomorrow's climate change*. Netherlands: Dialogue on Water and Climate.

64 K. Trumper, et al. (2009). *The natural fix? The role of ecosystems in climate mitigation*. A UNEP Rapid Response Assessment, United Nations.

65 C. Raleigh (2010). 'Political marginalisation, climate change, and conflict in African Sahel States', *International Studies Review*, Vol. 12, No. 1, pp.69–86.

66 UN Framework Convention on Climate Change (UNFCCC) (2007). *Climate change: Impacts, vulnerabilities and adaptation in developing countries*. Bonn, Germany: UNFCCC. Available at <http://unfccc.int/resource/docs/publications/impacts.pdf>

### Box 9. Climate Change and Pastoralist Conflicts

Pastoralism is essentially a quest through communal lands for “accessible” water in order to raise livestock and secure livelihoods when water becomes less “available” in a region. Although pastoralism has been an effective response to climate change and water scarcity, pastoralist movements are today being increasingly restricted by government policies favouring other sectors (e.g. intensive agriculture, tourism and environmental protection). Often stigmatised as backward and primitive, pastoralists today are forced to move into increasingly marginal or populated areas, raising the potential for conflict between farmers and pastoralists competing for scarcer land and water.

The Karamojan region in Uganda has been plagued by insecurity stemming from such conflicts. The *Karamojong* have been marginalised throughout history. They have continued to suffer from discrimination since colonisation. In fact, the region has been continuously denied state support in the form of basic public services, security and economic development. Together with the presence of small arms in the region, this bad governance pattern created a vicious cycle. The insufficient judicial system and the absence of the rule of law have resulted in a culture of impunity, leading to more and more pastoralists taking up arms to secure cattle and scarce resources. Some pastoralists tried to cope by switching to agriculture when most of their cattle died or were stolen by neighbouring tribes. However, their lack of experience in agriculture makes them even more vulnerable to food insecurity and further marginalises them.

As the population of cattle and humans increases in the region and the effects of climate change increase the frequency and intensity of drought, water resources are likely to become less available. Feeding into already existing conflict dynamics, the potential for violent conflicts increases. Governance issues and the marginalisation of the pastoralists is likely to further limit their access to water and climate change adaptation support. Conflict-resolution and prevention measures must take into account the repercussions of climate change and capitalise on the potential for cooperation between farmers and pastoralists competing for the same resources.<sup>67</sup>

**Governance** plays a key role in adapting to climate change and with regard to vulnerability of population groups. Adaptation measures require strong governance and policies at the local, national and transboundary level. As part of any governance efforts, the potential impacts of the measures themselves need to be understood, especially in relation to other potential sources of marginalisation and conflict, in order to design adequate measures. Both conflict prevention and early adaptation to changing water supply require good governance in order to implement responses in an effective, transparent and conflict-sensitive way. But climate change adaptation may not be a political priority for the governing institutions. This can be an indicator or result of **political marginalisation**. Another indicator can be privileged access for different groups to funds supporting financial and technical capacities for climate change adaptation.<sup>68</sup>

#### Questions:

- What are the impacts of climate change on water access and availability for the different user groups?
  - Are there changes in frequency, duration, intensity and geographic distribution of rainfall and snowfall? What are the impacts on water access and availability for the different user groups?
  - Are there changes in frequency, duration and intensity of extreme weather events, such as storm surges and floods, and what are the impacts on water access and availability for the different user groups?
  - Are there changes in the timing and discharge rate of stream flows and what are the impacts on water access and availability for the different user groups?
  - Is the area likely to be affected by sea level rise and what would be the impacts on water access and availability for the different user groups?

67 Oxfam GB (2000). *Oxfam Karamoja conflict study: A report*. Oxfam GB. Available at [http://www.oxfam.org.uk/resources/learning/pastoralism/downloads/karamoja\\_conflict.pdf](http://www.oxfam.org.uk/resources/learning/pastoralism/downloads/karamoja_conflict.pdf)

68 C. Raleigh (2010). Op. cit.

- Are there changes in recharge rates of underground aquifers and what are the impacts on water access and availability for the different user groups?
- How are the human impacts on the environment (identified and analysed in the next section) interacting with the impacts of climate change?
- What is the extent of the adaptive capacity of the different user groups to climate change?
  - Are the different user groups aware of the impacts climate change will have on their water access and availability?
  - What financial and technical means do the different user groups have to adapt to climate change effects on their livelihoods and domestic water supply?
  - How are government institutions reacting to climate change, e.g. are they supporting adaptation measures or sensitising the population?

## TOOLBOX 2. ACTOR MAPPING

Sometimes it helps to visualise the analysis of Step 3 to better understand the interactions of the different groups and factors. This can be done by a technique called actor mapping. Actor mapping is often used to analyse conflicts and the relationships among different actors. We have adapted this technique to our framework by including actors as well as water resources and external factors influencing water availability and/or access. The focus of this exercise is to better understand how different actors and factors impact water resources and the (possible) conflict structures.

You can use this exercise in a group using coloured cards, markers and a big pin-board, or alone using sheets of paper and a pen.

If you have a list of groups, like the one described in Toolbox 1, use this as a starting point.

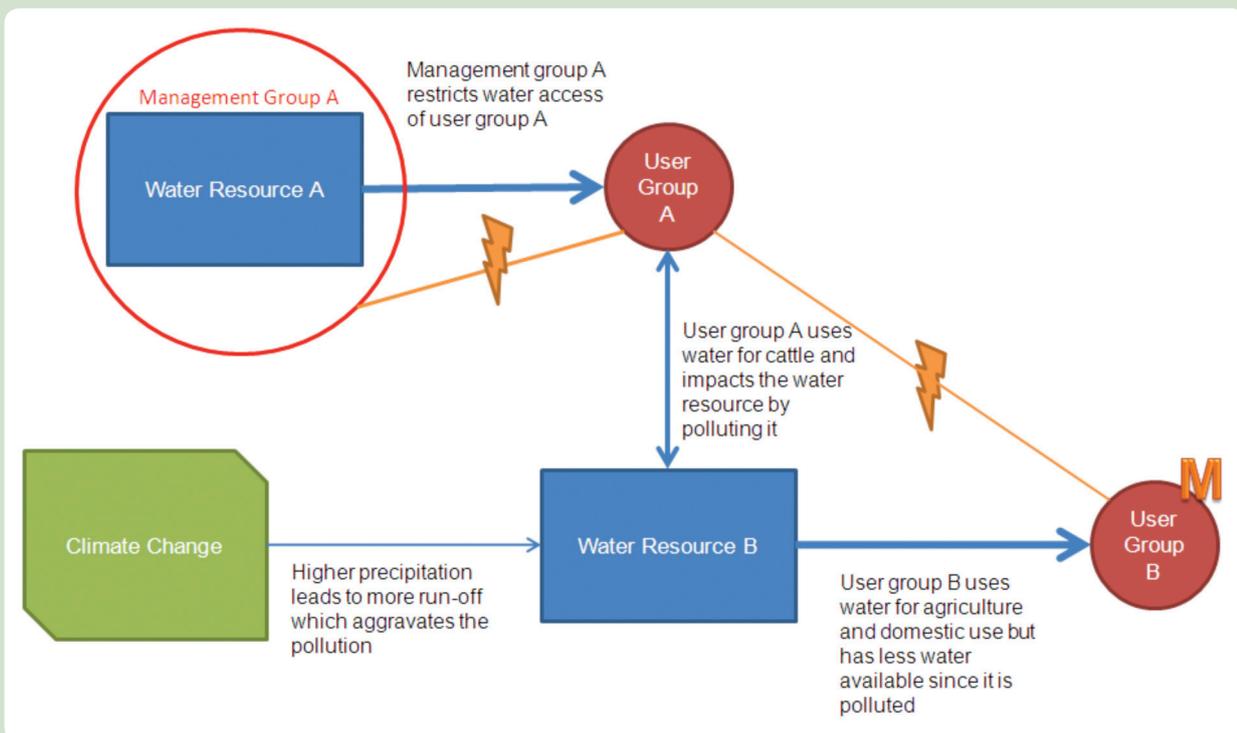
### Step 1:

- Start out with different cards for the water resources and user groups. First, put down all water resources and visualise all water uses and impacts with arrows. The strength of the arrow can be used as an indicator of severity and extent of the impact.
- Next to the arrow, write a short description of the use or impact.
- Mark every managed water resource with a circle around it and identify the name of the management group.

### Step 2:

- Mark marginalised groups with an M.
- Add external impacts such as climate change if necessary.
- Mark potential conflicts between different groups with lines and a flash; if there were specific incidents, you can also write them down next to the line. The strength of the line can be used as an indicator of the salience or intensity of the conflict.

### Example:



## 5. ANALYSIS OF THE BROADER CONTEXT

 **Guiding question:** How do your findings on unequal access to and availability of water affect, or how are they affected by, the broader context of the region under study?



**Output:** An analysis of the broader context which influences the conflict potential of local water conflicts.

### How to proceed

After analysing access and availability, as well as the role of marginalisation in this context, we are now turning to other factors that may fuel conflict without always being directly linked to water resources. This section builds upon the findings of section 4 and helps you put them into broader perspective. Three factors are analysed in this section. The first concerns the broader marginalisation context. As mentioned above, marginalisation in regard to water is often linked to broader discrimination of a certain population or water-user group. If you have identified marginalised groups in regard to water in the first part of your analysis, this section will help you understand the depth of their marginalisation in a broader context. You probably will have found hints to broader marginalisation already in Step 3, but, even if this is not the case, it is important that you check your user and management groups in this regard. Thus, the groups you have identified in the first part of the assessment framework (section 4) will now be looked at more carefully in order to determine how far they are also marginalised in regard to other non-water-related issues.

Another important contextual factor is the history of conflicts, which includes, but is not confined to, water conflicts. Ongoing and/or past conflicts in the community, region or country – such as civil war, ethnic rivalries or intrastate wars – are likely to increase the potential for conflict, as a culture of violence has been installed, cooperative mechanisms for conflict resolution are weak, and arms may be easily available. Maybe you have already found manifestations of conflicts in the first part of your analysis; now it is the time to find out if those interact with other or similar conflicts. Even if there are no manifestations of conflict, a history of conflict between certain management and/or user groups is a strong indicator of the likelihood of future conflict.

### 5.1 THE IMPACT OF BROADER MARGINALISATION

Marginalisation means that a social group is discriminated against (also see definition in section 2.2). This can go as far as being oppressed. The reasons for this can be many and can be driven, for example, by religion, culture, caste, ethnicity, tribe, etc. There are certain features which help identify marginalised groups. A good starting point is the socio-economic status of the different groups. Analogous to **socio-economic marginalisation** in regard to water, marginalised groups are often poorer with lower socio-economic status. But there are also cases of marginalised groups which are wealthier than the average. In addition, marginalised groups often do not have the same access to employment opportunities or government services, such as education and healthcare.

Again, as in the specific case of **political marginalisation** in regard to water, they often do not have the same political power to influence formal or informal decision-making processes or are excluded from those decision-making processes and governance institutions.<sup>69</sup> Often political decision-making processes and institutions mirror deeper cleavages or power structures of a country or region. Their design may exclude certain social, ethnic or religious groups. Or certain more powerful groups can misuse institutions or illegally influence governance through corruption or coercion. Transparency and participation are important factors in preventing this situation (see Box 4).

69 B. Adhikari and S. Di Falco (2008). 'Social inequality and collective action: An empirical study of forest commons', accessed on 12th July 2010. Available at <http://www.forestrynepal.org/publications/article/4153>

*Questions:*

- Are there reports of discrimination against certain groups?
- Which groups do not have equal access to government services, such as healthcare and education, and why?
- Which groups are limited in regard to the work they can do or the livelihoods they can pursue and why?
- Are certain social groups especially prone to poverty and why?
- Which groups do not have the same political representation and/or power in formal or informal decision-making processes and institutions and why?

## 5.2 THE ROLE OF EXISTING OR PREVIOUS CONFLICTS

The potential for water conflicts is much higher if there is already a history of conflict<sup>70</sup> or if there are ongoing conflicts between user groups. This includes but is not confined to water conflicts. Thus, your starting point should be manifestations of water conflicts you found in the first part of your analysis but should not be limited to those. Try to understand how the overall setting – including past conflicts or war – influences the emergence of disputes over water and how these need to be taken into account when analysing potential impacts of climate change on the resource and its sharing. There may well be a “hidden conflict” underlying the water conflict.<sup>71</sup>

Ongoing or past conflicts are likely to have led to a **polarisation and strong group identities**. The memory of conflict, especially if it included violence, is a very strong building block for group identities and can be used as a mobilisation tool in conflicts.<sup>72</sup> Examples for conflicts are civil wars, separatist or independence movements, or tensions along ethnic or social lines. Conflicts can be on every level – from the community level (inside and between communities) to the regional and national level. Often conflicts and cleavages in a society can be created or aggravated by **political leaders** who mobilise constituencies around these issues.

However, it is not only direct conflict between user groups that increases the risk of conflict; ongoing or past **conflicts in the region** or neighbouring countries also increase the risk. There are multiple ways in which conflicts in the neighbourhood can have a destabilising influence. Conflicts can create **refugee flows** of displaced people across borders, sometimes increasing the competition over water or increasing the pressure on ecosystems in the receiving region. Conflicts also make **small arms** more easily available, providing the means to turn a conflict violent. Also conflicts can “**spill over**”;<sup>73</sup> for example, if there is a conflict between two ethnic groups in a neighbouring country and these same groups also live beyond the border, or if rebel groups use neighbouring countries as a base or retreat area. This might lead to a situation where a conflict moves across the border.<sup>74</sup>

*Questions:*

- Is there a history of or are there ongoing (water) conflicts in the country?
  - How do or did conflicts manifest themselves, e.g. tensions, protests, violence, etc.? Who are or were the conflict parties?
  - What are the main political, social, ethnic, etc. cleavages in society and do they create or have they created conflicts? Which role do water resources directly or indirectly play in this context?
  - How do political leaders manage conflicts and/or cleavages in society?
  - Have past elections been accompanied by violence and why?
  - Is the local army currently involved in conflict?

70 Please note the “conflict” definition in section 2.2. This definition includes tensions, verbal confrontations, protests and any occurrence of violence.

71 K. Means, et al. (2002). Op. cit.

72 D. Enns (2007). *Identity and victimhood. Questions for conflict management practice*, Occasional Paper No. 28. Berlin, Germany: Berghof. Available at <http://www.berghof-conflictresearch.org/documents/publications/boc28e.pdf>

73 R. Geiss (2009). *Armed violence in fragile states: Low-intensity conflicts, spillover conflicts, and sporadic law enforcement operations by third parties*. ICRC. Available at <http://www.icrc.org/eng/assets/files/other/irrc-873-geiss.pdf>

74 D. Smith (2004). *Trends and causes of armed conflict*. Berghof Conflict Research. Available at [http://berghof-handbook.net/documents/publications/smith\\_handbook.pdf](http://berghof-handbook.net/documents/publications/smith_handbook.pdf); L. Fearnely and L. Chiwandamira (2006). *Understanding armed conflict and peacebuilding in Africa*. Pretoria: IDASA.

- Are there non-state armed groups, such as rebels, active in the region of analysis or in other parts of the country? Are they trying to control certain resources?
- Are small arms easily available to conflict parties?
- Is there a history of or are there ongoing conflicts in the broader region including neighbouring countries?
  - How do or did conflicts manifest themselves, e.g. tensions, protests, violence, etc.?
  - Are small arms easily moving across borders?
  - Are conflicts in the region mirroring conflicts in the assessed country?
  - Is the country assessed or the population living in border regions involved in conflicts in the region or neighbouring countries?
  - Are refugee populations increasing the competition over water and/or land?
  - How are the relations between the region of analysis and neighbouring regions, provinces or countries? What is the role of water issues?

### 5.3 TRANSBOUNDARY/INTERNATIONAL DIMENSION

Many water bodies span borders and countries. Water resources which cross borders are not limited to rivers but also include lakes and groundwater aquifers. This assessment framework does not cover conflicts arising between countries or user and management groups in different countries over transboundary water bodies.

However, internal water conflicts can also have international dimensions. This could be the case if water users and/or managers in one country impact water availability for water users and/or managers in another country. A very common case is the implementation of flow-regulation measures in an upstream country; for example, the diversion of large amounts of water for irrigated agriculture or to supply drinking water to large cities. This might lead to water scarcity and increased competition between users in the downstream country.<sup>75</sup> Thus, to understand the downstream conflict, the analysis cannot stop at the border. Effects from across the border on water availability and access have to be taken into account. However, international water ties between riparian countries may also help tackle local water conflicts and transboundary water resources can be an opportunity for peacebuilding.<sup>76</sup>

If you are analysing the conflict potential or ongoing conflict in a border region, other cross-border issues might arise. Many borders are porous and people can easily move across, thereby creating more pressure on water resources. For example, pastoralists in East Africa often move from country to country in their search for water and pasture, often creating conflicts with local populations. Another example is refugee movements mentioned in section 5.2. Water bodies, such as rivers, sometimes define political boundaries between countries. When these water bodies change, conflicts can arise as the borders change along with them. Transboundary water resources at the surface or below ground can also cause disputes between riparian states when the quantity and/or quality of water is affected by human impacts or other factors.<sup>77</sup>

<sup>75</sup> A. Houdret, et al. (2010). Op. cit.

<sup>76</sup> A. Kramer (2008). *Regional water cooperation and peacebuilding in the Middle East*, Initiative for Peacebuilding: Brussels. Available at [http://www.initiativeforpeacebuilding.eu/pdf/Regional\\_Water\\_Cooperation\\_and\\_Peacebuilding\\_in\\_the\\_Middle\\_East.pdf](http://www.initiativeforpeacebuilding.eu/pdf/Regional_Water_Cooperation_and_Peacebuilding_in_the_Middle_East.pdf); D. Phillips, et al. (2006). *Trans-boundary water cooperation as a tool for conflict prevention and broader benefit sharing*. Stockholm: Government of Sweden/Department For International Development Cooperation/Expert Group On Development Issues. Available at <http://www.ifh.uni-karlsruhe.de/people/fenton/Water-Resources/Transboundary%20Water%20Cooperation.pdf>

<sup>77</sup> C. J. Darnault (2008). *Overexploitation and contamination of shared groundwater resources: Management, (bio)technological, and political approaches to avoid conflicts*. Springer.

### Box 10. Semliki River (Uganda)

The Semliki River lies between Uganda and the Democratic Republic of the Congo (DRC) in the Great Lakes Region of Africa. Its natural course defines the political border between the two countries. The populations living in the region have been constantly suffering from the effects of violent conflicts which have plagued the region. Recently new oil reserves have been discovered under the river bed contributing to an increase in violent clashes between the two countries.

The Semliki River is partly responsible for exacerbating these tensions in the region. Global warming and anthropogenic environmental degradation are causing severe river-bank erosion, which in turn is changing the course of the river and thus the political border between the two countries.

The repercussions of these changes are affecting relationships between the two countries at a political level surrounding the oil issues. The ethnic groups living along the river have little political or financial support to cope with these changes. Farmers have become especially vulnerable, since many of them have lost farmland which is now on Congolese territory. In addition, farmers are generally poorer than other groups, such as pastoralists, which weakens their leverage during negotiations within local councils. Without any institutional support, they are forced to negotiate with the Congolese authorities. The absence of the rule of law and the presence of small arms in the DRC is undermining their ability to reach fair compromises. Ugandan farmers, who have lost their lands, are now obliged to pay fees to the Congolese authorities to access their lands as well as cross the river via canoe shuttle service. This situation is causing frustrations to rise among the farmers, which increases the potential for conflict in the region. Conflicts may erupt between the farmers and richer pastoralists who are simultaneously aggravating the erosion of river banks by accessing the river with their cattle and benefiting from the council's support through their income advantage.<sup>78</sup>

Be aware that cross-border issues and conflicts have their own peculiarities, including the fact that they play out on the international and diplomatic level.<sup>79</sup>

#### Questions:

- Are there any transboundary water bodies in your region of analysis?
- How do water users and managers from across the border impact water availability and/or access?
- Are (new) user groups coming from across the border?
- Are there or have there been other transboundary issues influencing water conflict (potential)?

<sup>78</sup> Interviews with NGOs, local government, and community members, Uganda, 2010.

<sup>79</sup> For more information on international water conflicts and how to analyse them, please see A. Houdret, et al. (2010). Op. cit.

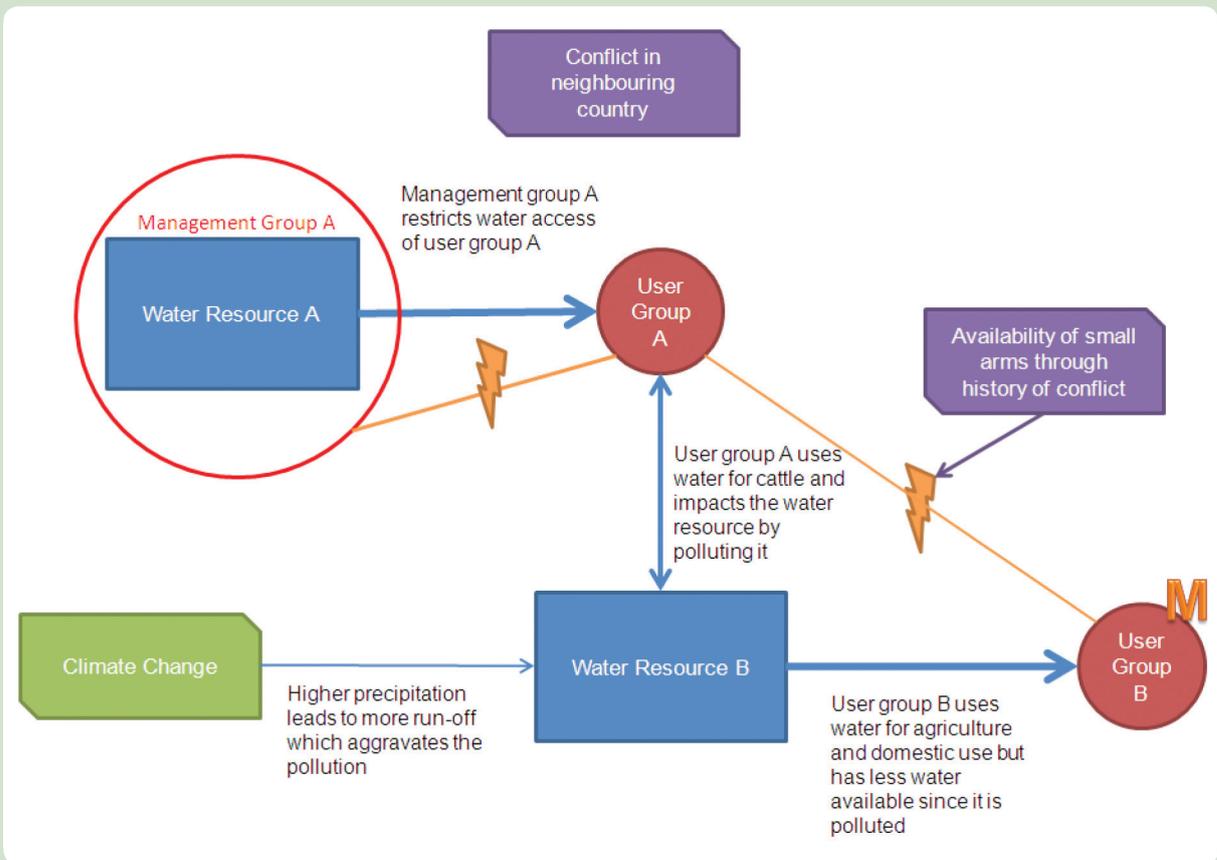
### TOOLBOX 3. ACTOR MAPPING – BROADER CONTEXT

If you created an actor map in Step 3, you can continue using it and add the broader context. There are two ways to do this: first, write the impacts from the broader context on the conflict (potential) on cards. Then:

- Place these cards on the board outside of the actor map, thereby visually showing that they are background forces impacting the overall conflict (potential). Or:
- Place the cards next to one of the lines signifying conflict (potential) and mark their impact with an arrow. As before, you can add information on this impact by simply writing it next to the arrow.

These two options can also be combined.

**Example** (broader context in purple):



## 6. IDENTIFICATION OF COOPERATION, CONFLICT-RESOLUTION AND PREVENTION POTENTIAL

 **Guiding question:** How do cooperation and conflict-resolution mechanisms decrease the likelihood of conflict or its violent escalation?

 **Output:** An analysis of cooperation and conflict-resolution mechanisms that can be mobilised to reduce water-conflict potential.

### How to proceed

The output of this section is an analysis of the factors enhancing cooperation and conflict resolution in the water sector and beyond. The identified institutions, actors and mechanisms can contribute to reducing water-conflict potential. They are therefore extremely relevant for designing entry points and possible activities to prevent a conflict from escalating into violence or to resolve or transform a conflict or crisis. Thus, this section not only helps us to assess conflict potential but also points to possible conflict-prevention and resolution opportunities.

The main problems and conflict factors identified above can be used to formulate a list of conflict-resolution and/or prevention opportunities, as well as cooperation possibilities. The starting points of your analysis are existing conflict-resolution mechanisms and institutions, as well as cooperation between different actors – this includes but is not limited to conflict resolution and cooperation in the water sector. While previous steps focused on conflictive relationships between actors, the analysis in this section focuses on the links between the different actors which can be used to decrease the potential for conflict – such as strengthening social and economic ties between communities and involving them in common processes. Often, such common platforms and shared interests already exist but their potential in terms of conflict prevention and resolution is not sufficiently considered. The output of this section is an analysis of cooperation and conflict-resolution mechanisms which can serve as entry points for actions to decrease conflict potential.

The following section gives you an introduction to conflict resolution and cooperation, and some factors which are important to assessing their effectiveness.

### Cooperation, conflict resolution and prevention

Institutions for water management, but also non-water-related mechanisms for **conflict resolution**, can – if they are **legitimate, inclusive, representative and transparent** – help solve and prevent conflicts.<sup>80</sup> 'When conflict management institutions are strong, distributional outcomes are less sensitive to any group's opportunistic behaviour aimed at obtaining a disproportionate share of available resources'.<sup>81</sup> If they do not fulfil these criteria, chances are high that one or more groups will be excluded from the conflict-resolution process, and that decisions or actions will be regarded as unfair or unjust, creating grievances. In this case, conflict-resolution mechanisms can lead to conflict by marginalising certain social groups.

<sup>80</sup> See also G. Bächler, K. Spillmann and M. Suliman (2002). *Op. cit.*

<sup>81</sup> World Bank (2002). *Reducing vulnerability and increasing opportunity: Social protection in the Middle East and North Africa. Orientations in Development*. Washington, DC: World Bank, p.27.

Conflict resolution in general includes all actions that try to resolve or transform a conflict; for example, actions that solve underlying problems, such as the degradation of certain ecosystems or the allocation patterns for water. These actions and mechanisms can be institutionalised as formal regulatory bodies or as traditional authorities. It depends greatly on the specific local context, whether one or the other is more efficient; they should therefore both be taken into account in the analysis.

### Definitions

*Conflict resolution:* All actions that help to solve or transform conflict (potential)

*Conflict prevention:* All actions that help to reduce the potential for conflict

*Cooperation:* Working together for a common benefit

Besides specific institutions in charge of conflict resolution, all actions that reduce the potential for conflict can prevent conflict. One important mechanism to reduce the potential for conflict is strengthening **cooperation between (potential) conflict parties**. Cooperation as a principle entails more than one group working together for a common benefit. As groups cooperate, communication channels are opened up, trust is built, and stable relationships are created. Examples can be seen in business exchange, cultural associations and common institutions for managing livelihoods. Cooperation can also contribute to decreasing the likelihood of water conflicts as channels for existing managing disagreements.<sup>82</sup> Cleaver analyses the potential of social relationships for solving water conflicts in Tanzania and concludes: 'preferred channels for resolving disputes over resource use are existing social and cultural structures. [...] Social forms of conflict resolution (often conducted through village elders) emphasise the generous interpretation of compliance with the rules (a blind eye is turned to a limited amount of free riding), the negotiation of compliance over time, rather than at a single event, and the desire for reconciliatory rather than adversarial solutions (fines and punishments are imposed only in the last resort)'.<sup>83</sup>

This also includes cooperation at a transboundary level, such as trade links or cross-border environmental cooperation in managing nature conservation reserves.<sup>84</sup> Besides actions that try to strengthen or improve the relationships between conflicting groups, actions to reduce the potential for conflict can also be very general in nature and aimed at broader problem structures that underlie a conflict (potential); for example, by fighting corruption or developing better capacities in the water sector.

### Box 11. Cooperation in the Water Sector for Peacebuilding in Papua New Guinea

Water can create important divides but it is also a great resource to connect people. As water is essential for life, it can successfully promote cooperation among different groups relying on the availability and accessibility of the resource.

Promoting cooperation among groups sharing the resource can also serve as a successful strategy for peacebuilding and conflict resolution at a community level. For example, working together on water infrastructure and management projects can bring conflict parties together in order to improve their water access and availability. Oxfam used this approach to promote peace among conflicting tribes in the highlands of Papua New Guinea. The country receives a lot of rainfall but less than 10 percent of the population has access to safe water for drinking with large disparities in water provision within the country. Additionally, the waterways used by the marginalised communities in the highlands are often polluted by sewage, coffee pulping and tailings from large mines. Tribal fighting has increased in recent years and is impeding the

82 P. Mathieu, A. Benali and O. Aubriot (2001). 'Dynamiques institutionnelles et conflit autour des droits d'eau dans un système d'irrigation traditionnel au Maroc' [Institutional dynamics and conflicts around water rights in a traditional irrigation system in Morocco], *Revue Tiers Monde*, Vol. 42, No. 166, pp.353–74; FOEME (2005). Op. cit.

83 F. Cleaver and T. Franks (2003). 'How institutions elude design: River basin management and sustainable livelihood'. Conference: The Alternative Water Forum, 1st–2nd May 2003, University of Bradford, accessed 1st February 2008. Available at <http://www.brad.ac.uk/acad/bcid/GTP/CleaverFranks.pdf>

84 A. Houdret and M. Westerkamp (2010). *Peacebuilding across Lake Albert: Reinforcing environmental cooperation between Uganda and the Democratic Republic of Congo*. IfP: Brussels. Available at [http://www.initiativeforpeacebuilding.eu/pdf/peacebuilding\\_lake\\_albert.pdf](http://www.initiativeforpeacebuilding.eu/pdf/peacebuilding_lake_albert.pdf)

development of the region. It has also caused the displacement of many families, who have chosen to relocate to safer areas away from the lands which provide for their livelihoods. Working with women who have taken the initiative to take action in ending the conflict, Oxfam is successfully bringing former enemies together to work on the construction and management of a new water-supply system, building trust and opening communication channels among the groups in the process.<sup>85</sup>

Using a conflict-sensitive approach, water infrastructure projects have the potential to foster cooperation in the design and construction phases of the project but also during the operation and maintenance of the water-supply system. Indeed, if water-management institutions are legitimate, recognised and transparent, they can significantly improve the long-term sustainability of a peace process.

It is important to understand that conflict-resolution mechanisms and cooperation do not have to be specifically designed for the water sector to decrease the likelihood of water conflicts. This also works the other way: new cooperation projects in the water sector can be a starting point for conflict prevention and peacebuilding in a broader sense. Just as cooperation projects in other sectors have an influence on water conflicts, water cooperation projects also have an influence on other conflicts.

Strengthening cooperation and conflict prevention can therefore be encouraged through water-specific measures and instruments, such as the creation of water-management institutions, but also through the reinforcement of existing, non-water-related ties between conflicting parties. In order to estimate the potential of existing institutions to contribute to the resolution or prevention of water conflicts, their legitimacy at the local, national and regional level – and especially from the point of view of the conflicting parties themselves – has to be carefully assessed.

The crucial question is: how do you get conflicting parties to sit down together to solve a conflict or how do you get them to start cooperating if they have no interest in doing so? As pointed out above, cooperation depends on the common interest of the cooperating groups. If no common interest exists, cooperation will most likely not take place or break down quickly. In this case, the incentives for the conflicting parties have to be changed and a common interest created. This can be achieved by making it more costly to not cooperate, for example, by punishing a group for not cooperating, or by rewarding a group which cooperates. Making non-cooperation more costly can, for example, be achieved by getting an external actor to intervene, such as the national government imposing stricter regulation. Rewarding certain groups for cooperation can be difficult, especially if they already possess more power and resources; for example, it can be perceived as unfair if a user group that already has more water is rewarded by getting better irrigation technology which enables them to use less water. But sometimes this is the only way to provide incentives and convince groups to start cooperating and transform the conflict.

As in the other steps, there are no generic solutions to achieve this. In order to identify conflict-resolution and prevention activities, you have to understand the interests and positions of all actors. Based on this analysis, cooperation and conflict-resolution or -prevention opportunities can be identified or created. It is very important that all solutions are conflict and context sensitive in order to minimise unintended consequences and to not create or fuel conflict. In the context of development cooperation, this principle is called “do no harm”.<sup>86</sup> Conflict sensitive means understanding the context, understanding the interactions between one’s own actions and the context, and acting upon this understanding.<sup>87</sup>

At the same time, it is important to note here that conflict is part of every social group and society. Conflicts can be an important catalytic force for social change; for example, righting an injustice such as the marginalisation of a certain social group. Conflict-resolution mechanisms and cooperation can help manage those conflicts

85 Oxfam NZ (2010). ‘Papua New Guinea: Water in Bougainville. Oxfam NZ’, accessed on 2nd August 2010. Available at <http://www.oxfam.org.nz/what-we-do/where-we-work/pacific/papua-new-guinea/water-in-bougainville>

86 OECD (2001). *The DAC guidelines helping prevent violent conflict* OECD: Paris. Available at <http://www.oecd.org/dataoecd/15/54/1886146.pdf>

87 FEWER, International Alert and Saferworld (2003). *Conflict-sensitive approaches to development, humanitarian assistance and peace building. Tools for peace and conflict impact assessment. A resource pack*. Conflict Sensitivity Consortium: UK. Available at <http://www.conflictsensitivity.org/publications/conflict-sensitive-approaches-development-humanitarian-assistance-and-peacebuilding-res>

and prevent them from escalating into violence.<sup>88</sup> In a long-term perspective, it is essential to overcome the initial causes of conflict with 'processes and policies that result in modifications, or the overhaul, of structures or institutions so that they better respond to the needs and aspirations of the sectors of society who seek their transformation'.<sup>89</sup>

*Questions:*

- Are there formal or informal institutions, rules or mediators for water-conflict resolution?
  - Are those institutions and conflict-resolution mechanisms regarded by all groups as legitimate and fair?
  - If not, are the groups who perceive they are not being treated well by these institutions also marginalised in other socio-political matters (see also sections 4.3 to 4.5 and 5.2)?
  - Do the institutions for conflict resolution intervene in a timely manner and achieve a reconciliation of interests?
  
- In which other sectors do the analysed groups cooperate?
  - Where are the places or structures they meet, exchange and build relationships? Since when do these exist and are they used by important decision makers of the groups?
  - Which common authorities are perceived to be independent by all parties?
  
- How can conflict factors be turned into cooperation potential?
  - Are there cooperative approaches possible which can decrease some or all conflict factors?
  - What are possible solutions to water access and availability problems?
  - What are possible ways to prevent or resolve the water conflict?
  - What are the interests of the different actors? How can those interests be changed?
  - Is there a common interest between the groups? Is there a problem they can only solve together?

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<sup>88</sup> K. Means, et al. (2002). Op. cit.

<sup>89</sup> E. Garcia (2006). 'Addressing social change in situations of violent conflict: A practitioner's perspective'. In D. Bloomfield, M. Fischer and B. Schmelzle (2006). *Social change and conflict transformation*. No. 5. Berlin: Berghof Research Center for Constructive Conflict Management, p.40. Available at [http://www.berghof-handbook.net/documents/publications/dialogue5\\_sochange\\_complete.pdf](http://www.berghof-handbook.net/documents/publications/dialogue5_sochange_complete.pdf)

## 7. CONNECTING THE DOTS – A TYPOLOGY OF INTERNAL WATER CONFLICTS

 **Guiding question:** How do the different factors interact and create conflict (potential)?

 **Outcome:** A conclusion for all analysed factors above which explains how the different conflict factors interact and create or might create conflict as well as possible conflict-prevention or -resolution opportunities.

### How to proceed

After analysing unequal access and availability, the role of marginalisation in regard to water and in general, the history of conflicts, the international dimension and cooperation, conflict resolution and potential, it is important to connect all these factors and explain how they lead to conflict or increase conflict potential, as well as what possible conflict-prevention and -resolution opportunities exist. This is the most important and difficult part of the assessment.

To help you with this final part, the following section illustrates the most common conflicts between different user and management groups. This part will help you recognise patterns. It is based upon the state of research in the field of water conflicts,<sup>90</sup> but it is not an exhaustive list and there are more conflict constellations in which water plays a role. Sometimes user conflicts described here also overlap and interact. In addition, be aware that conflicts are always highly context specific. At the very least, this part can serve as small generic case studies and illustrate the previous points made about water, marginalisation, conflicts and cooperation in general. However, it will hopefully give you some guidance on how to analyse a water crisis or conflict situation you are confronted with and help identify entry points for action.

After each type of user conflict, you will find a summary of conflict factors and cooperation possibilities. These categories link to the previous sections, which introduced these categories in general and provided questions to assess them.

### 7.1 BETWEEN PASTORALISTS AND FARMERS

Pastoralists and farmers rely on the same resources for their livelihoods: water and land. Competition between those two groups for these resources has often led to conflict. Sometimes conflicts erupt not because of competition over water or land but because pastoralists and their cattle, while trying to access a water source, destroy fields or gardens of farmers.

Traditionally, pastoralism takes place in marginal areas which are suboptimal for agriculture. Water availability is mostly limited and predicted to decrease due to climate change. Also, other pressures such as population growth and land degradation often increase the pressure on land and water. Other factors which tend to play into these conflicts include unclear tenure systems on the governance level and socio-economic and political marginalisation of pastoralists. For example, pastoralists are seldom represented in political institutions and governments often see their lifestyle as backward. In addition, pastoralists and farmers have very different lifestyles and cultures. Combined with different ethnicities and religions, these factors can serve as strong group identities.<sup>91</sup>

<sup>90</sup> For the latest findings and relevant authors, see A. Houdret, et al. (2010). Op. cit.

<sup>91</sup> A. G. Shettima and U. A. Tar (2008). *Farmer-pastoralist conflict in West Africa: Exploring the causes and consequences. Vol. 1.2.* Department of Applied Social Sciences at the London Metropolitan University, pp.163–84.

In many parts of Africa, especially along the cattle corridor of East Africa, pastoralist and farmer conflicts take place in already conflict-prone regions which are awash with small arms and non-state armed groups.<sup>92</sup>

Conflicts have been reported from many countries (Kenya, Uganda, Central Asia, Nigeria, Niger, etc.).

## ASSESSMENT FRAMEWORK

### Step 2: Identification of user groups

- Farmers who need water for irrigation and domestic use or whose crops are destroyed by pastoralists trying to access a water source
- Pastoralists who need water for their cattle

### Step 3: Analysis of water availability and access

*Climate Change:*

- Likely to decrease available water, as well as lead to longer and more severe droughts

*Environment and Human Impact:*

- Water availability: Rising water stress through growing population and land degradation due to overuse
- Governance: Unclear or non-existing tenure systems

*Marginalisation:*

- Socio-economic and political marginalisation of pastoralists

### Step 4: Analysis of the broader context

- Strong group identities: Different tribal, ethnic or religious identities and lifestyles can serve as group identities and to mobilise interests
- Conflict history: Conflicts in the region and high availability of small arms (in Africa)

### Step 5: Identification of cooperation, conflict-resolution and -prevention potential

- Local and legitimate conflict-resolution institutions
- Better legal framework (tenure systems)
- Alternative livelihoods
- Disaster preparedness (droughts)

## 7.2 BETWEEN AGRICULTURAL USERS

Conflicts over water between different users in the agricultural sector are very common, especially farmers fighting over decreasing irrigation water. However, these are not the only conflicts; the rise of aquaculture has also led to conflicts over water between farmers and aqua farmers.

Conflicts between (aqua) farmers are often fuelled by rising water demand, weak water institutions and overuse. A very common case is the overuse of groundwater resources leading to dropping water tables which renders access to water for some farmers, who do not have the technical and/or financial means to dig deeper wells, difficult. These differences often go hand in hand with socio-economic inequalities between different groups of (aqua) farmers and feed into already existing rivalries. On the governance level, the higher socio-economic status of certain groups of (aqua) farmers often translates into more power or the ability to use corruption or other informal ways of influencing water-management institutions in their favour. You can find examples of these conflicts in China, North Africa, India, Iran and Yemen.

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92 K. A. Mkutu (2008). *Guns and governance in the Rift Valley: Pastoralist conflict and small arms*. James Currey.

## ASSESSMENT FRAMEWORK

### Step 2: Identification of user groups

- Different groups of farmers (e.g. big farmers and small farmers or farmers and aqua farmers) need water for agriculture

### Step 3: Analysis of water availability and access

#### *Environment and Human Impact:*

- Growing demand for irrigation or intensive aqua farming leads to overuse and depleted water resources

#### *Marginalisation:*

- Some farmers have better technological, financial and political capacities to access water and diminish the amount of water available for other users

#### *Water-management institutions:*

- Weak and/or corrupt water-management institutions

### Step 4: Analysis of the broader context

- History of conflict: Existing rivalries

### Step 5: Identification of cooperation, conflict-resolution and -prevention potential

- Improve water-management institutions, especially through participative approaches, like water-user associations
- Information and awareness-raising regarding the effects of water overuse
- Increase water efficiency through technology

The same conflict structure can be found among different groups of fishermen. Conflicts are fuelled by rising pressure on fish stocks and the lack of fishery management institutions. This leads to overfishing and declining fish stocks. As with different groups of farmers, some groups of fishermen, e.g. big commercial companies, often have better technical and financial means, e.g. bigger boats and nets, which allow them to take out much more fish than small-scale fishermen. These large-scale fishery operations lead to overfishing and less fish for small-scale fishermen. Also, large-scale fishermen tend to have more political power stemming from their better socio-economic status. For example, in Senegal, government policies favouring fish exports have promoted industrial fishing led by European trawlers. This situation, combined with the lack of planning and control, has depleted fish stocks and increased competition, exacerbating conflicts both among small-scale fishermen, as well as between industrial and small-scale fishermen.<sup>93</sup>

## ASSESSMENT FRAMEWORK

### Step 2: Identification of user groups

- Different groups of fishermen using the water body for fishing

### Step 3: Analysis of water availability and access

#### *Environment and Human Impact:*

- Growing demand and intensive fishing techniques lead to overfishing and the depletion of water resources

<sup>93</sup> H. Abaza and V. Jha (2002). *Integrated assessment of trade liberalization and trade-related policies*. New York and Geneva: UNEP.

*Marginalisation:*

- Some fishermen have better technological, financial and political capacities and diminish fish stocks available for other users

*Fisheries management institutions:*

- Nonexistent, weak and/or corrupt fishery management institutions

**Step 5: Identification of cooperation, conflict-resolution and -prevention potential**

- Improve or create fishery management institutions, especially through participative approaches
- Information and awareness-raising regarding the effects of overfishing

**7.3 BETWEEN AGRICULTURE AND OTHER ECONOMIC SECTORS/ DOMESTIC WATER USERS<sup>94</sup>**

Another common conflict constellation is water conflicts which are created through economic and social development processes, often called modernisation. The process of industrialisation and economic development leads to new user groups in different economic sectors and industries. It also often entails growing urbanisation and the rise of a new middle class which in turn leads to changing domestic water consumption patterns.<sup>95</sup> These new water users lead to growing demand which is often not met by sufficient supply. This can create conflicts between traditional economic sectors like agriculture and these new user groups. These development processes can also be linked with conflicts over land use.

This is often the case in peri-urban areas – areas around expanding mid-sized and big cities. Traditional farmers have to compete with domestic users and investors, for example, in tourist resorts or factories. Infrastructure development often cannot match rapid development and urbanisation. Pollution by farmers through pesticide use and/or fertiliser run-off or by untreated waste water from domestic or industrial users can also lead to conflicts.

**ASSESSMENT FRAMEWORK****Step 2: Identification of user groups**

- Agricultural, industrial and domestic water users

**Step 3: Analysis of water availability and access***Environment and Human Impact:*

- Rapidly growing demand through new user groups
- Increased pollution through intensive farming, urban water users and/or industrial users
- Governance: Weak institutions and infrastructure cannot keep pace with rapid demand growth and waste water; national development priorities privilege new economic sectors

*Marginalisation:*

- Politically and financially powerful players have privileged water access often combined with corruption

**Step 5: Identification of cooperation, conflict-resolution and -prevention potential**

- Sustainable urban planning and integrated water-resource management
- Anti-corruption measures
- Short term: Stakeholder dialogues, concrete cooperation projects

<sup>94</sup> Especially between user and management groups in peri-urban areas.

<sup>95</sup> F. Molle and J. Berkoff (2006). *Cities versus agriculture: Revisiting intersectoral water transfers, potential gains, and conflicts*. Colombo: Comprehensive Assessment of Water Management in Agriculture.

## 7.4 BETWEEN PUBLIC OR PRIVATE WATER MANAGERS AND DOMESTIC WATER USERS

Water is regarded in most countries as an essential public service. Bad water management, lacking investments in infrastructure or maintenance, and/or changes in the organisation of water management can cause disruptions in water availability or access which, in turn, can lead to conflicts, especially if inadequate service is combined with rising water prices.<sup>96</sup> Often poorer parts of the population are more vulnerable to these developments, as they do not have the financial means for adaptation measures, such as bottled water or private water tanks, or simply are not able to pay higher water prices.

Well-documented examples include conflicts around the privatisation of water services which often lead to rising water prices unmatched by better services, such as the water conflict in Cochabamba, Bolivia.

### ASSESSMENT FRAMEWORK

#### Step 2: Identification of user groups

- Domestic water users

#### Step 3: Analysis of water availability and access

*Management groups:*

- Public or private water service providers

*Environment and Human Impact:*

- Governance: Not enough water available or accessible because of bad management and/or lacking infrastructure; rising water prices

*Marginalisation:*

- Socio-economically weak groups are hit harder, as they cannot afford adaptation measures or higher prices

#### Step 5: Identification of cooperation, conflict-resolution and -prevention potential

- Cooperative and participative approaches to drinking-water management
- Water-sector reforms and transparent management
- Decentralised water provision as an alternative to privatised supply
- Strong codes of conduct including socio-economic criteria for privatised supply and subsequent monitoring and sanctions mechanisms

## 7.5 BETWEEN PUBLIC AND PRIVATE WATER MANAGERS AND (OR BETWEEN) WATER USERS AFFECTED BY LARGE INFRASTRUCTURE PROJECTS

Large-scale infrastructure projects in the water sector, such as irrigation systems or dams, have a great impact on water availability and access. They have the potential to increase water availability and access for large user groups, but at the same time they often decrease water availability or restrict water access for other water groups. For example, a dam can be used to provide water to surrounding villages or can be transported to faraway cities or new agricultural centres, but it can also lead to decreased water downstream, especially in years with less water available. These changes in water availability and accessibility can create new conflicts. Conflicts can emerge between public or private water managers of the infrastructure and water users. In addition, conflicts can emerge between different user groups which have unequal access to the water due to infrastructure. Often weaker social groups are not heard or involved in the planning and decision-making

<sup>96</sup> B. Balanyá, B. Brennan, O. Hoedeman, et al. (2005). Op. cit.; M. Barlow and T. Clarke (2002). Op. cit.

processes of large infrastructure projects. Thus, they have little capacity to influence outcomes. On the other hand, large infrastructure projects tend to favour large-scale agriculture, industry and fast-growing urban centres (note the overlap to user conflict in section 7.3).

Other conflicts surrounding issues of lack of compensation for the expropriation of local communities losing houses and/or livelihoods and for critical environmental impacts are also common. Another conflict constellation can occur when large-scale infrastructure has an impact on cross-border water flows (see also user conflict in section 7.6 and international water conflicts).

## ASSESSMENT FRAMEWORK

### Step 2: Identification of user groups

- Agricultural, industrial and urban water users

### Step 3: Analysis of water availability and access

*Environment and Human Impact:*

- Large infrastructure projects change water availability and water access

*Marginalisation:*

- Weaker social groups are often not heard or involved in the planning of large infrastructure projects; large infrastructure projects often serve large-scale agriculture, industry and urban centres

### Step 5: Identification of cooperation, conflict-resolution and -prevention potential

- Cooperative and participatory planning and decision processes
- Data sharing for assessing potential impacts
- Social and environmental impact assessments, including conflict sensitivity at the domestic and transboundary levels

## 7.6 BETWEEN REGIONS WITHIN THE SAME COUNTRY

Water bodies can cross administrative borders inside countries. If these countries have a decentralised administrative structure and the sub-national units have the power to influence water access and/or availability across their border, conflicts can emerge between those units. Examples are federal states, such as India. Those conflicts are often referred to as interstate water conflicts.

These conflicts normally include the management groups on the governmental state level and the affected user groups. Management groups in one state impact water access and availability of user groups in another state through policies and governance. This can happen in many different ways; for example, through water-management and infrastructure projects, such as dams or irrigation systems. Often, regulation or conflict-resolution mechanisms exist, such as treaties to govern the shared resources or federal institutions; for example, constitutional courts or special tribunals.<sup>97</sup> If conflicts arise, often these institutions have failed or existing regulation is not implemented or has gaps and grey areas. Sometimes also the lack of regulation or water-management institutions leads to conflict.

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97 P. B. Anand (2004), 'The political economy of water scarcity and issues of inequality, entitlements and identities: A tale of two cases from southern India', *International Journal of Technology Management and Sustainable Development*, Vol. 3, No. 2, pp.115–32.

## ASSESSMENT FRAMEWORK

### **Step 2: Identification of user groups**

- All user groups

### **Step 3: Analysis of water availability and access**

*Management groups:*

- Government institutions on the state and federal level (ecosystem and/or water-management groups)

*Water management:*

- Existing water-management institutions and conflict-resolution mechanisms have failed or are missing

### **Step 5: Identification of cooperation, conflict-resolution and -prevention potential**

- Existing institutions and regulation
- Common water-management institutions, such as joint commissions

## 8. FROM ASSESSMENT TO ACTION

Finally, before we conclude with some possible actions that can follow your assessment, we would like to draw your attention to the importance of conflict sensitivity in your own work. Regardless of the intended use, it is crucial that you meticulously check your results and that, after any intervention using these results, you continuously update the findings according to the evolving situation on the ground. Think of it more as the beginning of a process than a finished assessment.

You must also pay careful attention when communicating and distributing the outcomes of the assessment in the region affected by conflict. As the framework analyses contentious issues covering a wide range of sensitive topics, such as the role of marginalisation in conflict, the findings could highlight one group's disadvantage compared to another. It is important that these do not serve to legitimise one group's behaviours or actions that create further divides and fuel conflict. Cooperation potential identified in the assessment can play a crucial role in resolving and preventing conflict and should be the focus of what is delivered to the affected communities.

In the best case, a finished assessment:

- Raises awareness;
- Identifies key risks and conflict potentials;
- Enables the next steps of action;
- Identifies knowledge gaps.

The following list briefly describes possible actions that may be taken using the findings of the analysis. It is not an exhaustive list, as the findings developed using the WACCAF can be used in various ways within the peacebuilding process of a selected region. These depend on your interests, needs and available resources that helped to define the objectives set out during the first step of the framework (Step 1: Answering the what, where, why and who).

### **Case study**

Using WACCAF's findings, a case study can be written about a specific region suffering from an ongoing water conflict or any other region of interest for your study. This may sharpen your understanding of a particular conflict (potential) and generate knowledge about what critical issues should be addressed by initiatives supporting the peace process. Depending on the time available to gather data and compile findings, the case study can also highlight important factors which can be looked at more extensively in future research. The results of the case study should be summarised and recommendations discussing the ways forward should be included.

### **Report**

WACCAF's findings can also be integrated, for example, into a wider security report. These are often produced by international organisations or government institutions wishing to create national or regional development programmes that support interventions that minimise conflict potential and create opportunities for peace.

### **Capacity-building**

WACCAF can also be used directly for capacity building at the local level. Training can be organised and offered to relevant actors working in the field that may include, for example, civil society organisations supporting peace efforts. Training is ideally a combination of workshop sessions and a field trip visit to a conflict area with the trainees. Training may also be provided to any institution or individual working in the water sector wishing to

improve their knowledge on water-related conflicts and their response strategies. The actor-mapping tool integrated into the framework is particularly useful when carrying out these types of training, as it provides a visual aid to the trainees working with the framework. For further information on how to carry out training, please refer to the WACCAF training manual.

**Infrastructure projects**

Water infrastructure projects can increase the potential for conflicts if they do not take into consideration the local setting and all stakeholders' concerns. WACCAF can be used to shed some light on key contentious issues and help to use a conflict-sensitive approach in these projects. Encouraging engineers and technicians involved in the conception and implementation phases to take into consideration these findings could reduce the potential for conflict among groups. Identified cooperation potential could benefit managing committees responsible for the long-term sustainability of the project.

**General education**

WACCAF findings can also be used by researchers and academics wishing to learn about the underlying factors behind water-related conflicts.

INITIATIVE FOR PEACEBUILDING  
EARLY WARNING

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