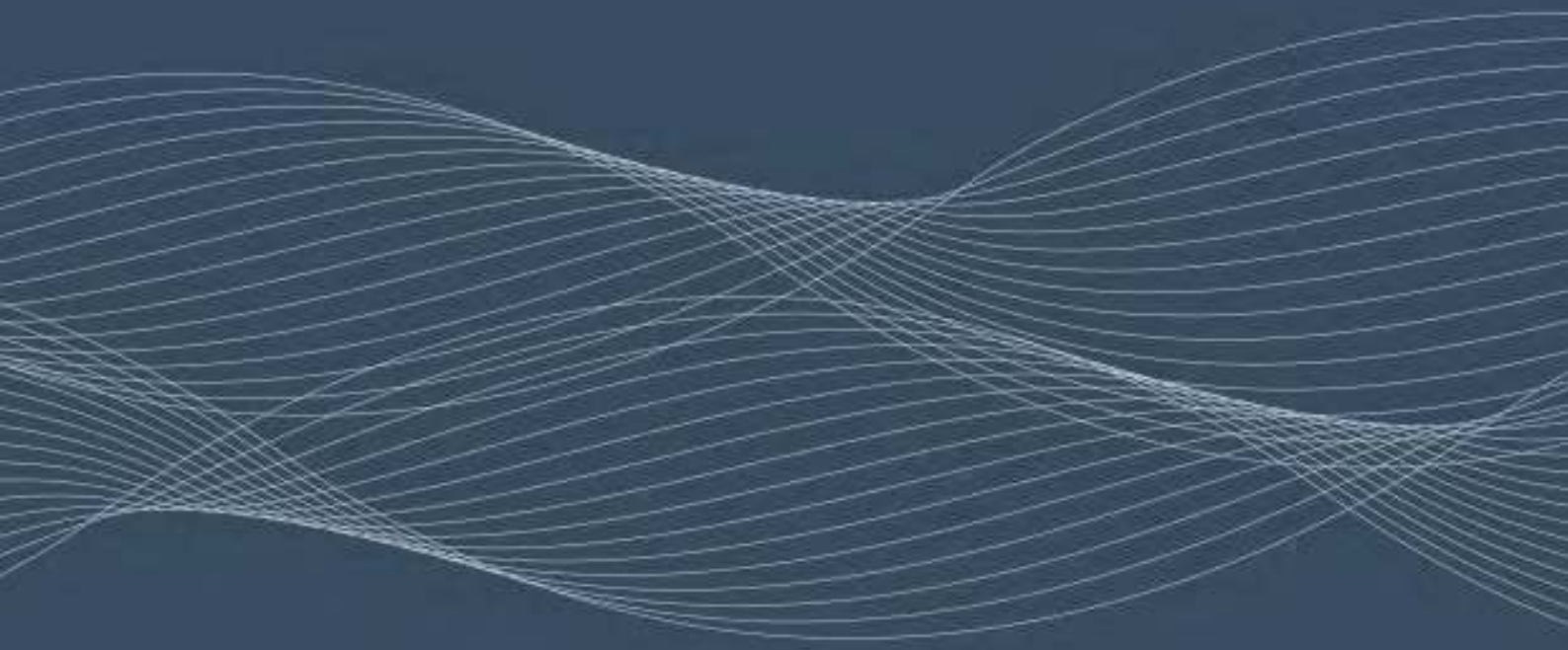
The Political Economy of Water Management in Yemen: Conflict Analysis and Recommendations



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About the project

The goal of the project is to develop policy relevant recommendations for the Dutch Embassy in Sana'a, Yemen, for the prevention and the resolution of water-related conflicts, by assessing the political economy of water governance in Yemen.

Water governance is a complex and inherently political process with assumed game-changing potential. It may prevent an acute water crisis from turning into a large-scale violent conflict, or it may exacerbate the situation further. Water scarcity in Yemen is a human security threat. According to unofficial estimates, 2,500 people die annually as a result of water-related conflicts. Therefore, prevention and adaptation strategies are needed for the local, regional, and national level that are based on a robust understanding of the various sources of insecurity, their interdependency and cumulative conflict potential.

Water issues are complex because of the intricate coupling with multiple issues within the natural and societal domains. Water governance must take into account uncertainties due to incomplete knowledge, uncertainty induced through conflicting views on the problems and possible solutions, and unpredictable behaviour of the physical, social-economic and political systems.

In this project, we developed an analytical framework to analyse the political economy and the conflict dimensions of water governance in Yemen. Key components of this framework are:

1. Context and contextual changes: How are the conflicts embedded in the local physical, socio-economic, political and legal-institutional contexts? Do these contexts lessen, intensify, shape and distribute the conflict? Have contextual changes triggered or caused the conflict?
2. Stakeholder analysis: Who are the relevant stakeholders in the conflict? What are their interests? What practices are stakeholders using to pursue their interests?
3. Dispute regulation mechanisms: Which conflict resolutions are tried and why? Which resolutions are not tried?

Local experts conducted in-depth individual interviews and group discussions on nine actual conflicts in three areas across Yemen. The areas were chosen to represent a cross-section of the different geo-hydrological and socio-economic contexts:

- Competition over groundwater in the highlands (Sana'a basin);
- Conflicts over surface water in ephemeral rivers (Wadi Siham);
- Peri-urban competition (Ta'izz).

Findings

Water management in Yemen

Yemen has a long history of suffering from water scarcity, which laid the foundation for the agricultural norms and traditions to regulate water distribution, maintenance of the irrigation infrastructure, and dispute resolution mechanisms. In the areas under research, the people mainly rely on traditional rules (*Urf*) and other agreements to regulate the rights and restrictions with regard to water access, use and distribution. These rules are unwritten and are specific to the areas covered by the assessment since there may be other rules outside these areas. The rules specific to this assessment concern three sources of water.

- Surface (otherwise known flood) water: There are restrictions concerning the distribution of water, but they are in many cases out-dated as they do not accommodate for the presence of permanent structures (check dams) and the impact of these structures on groundwater recharge and hence the availability of drinking water.
- Groundwater: Historically, for groundwater rules are not specified, though in several cases a distance rule is used, which in the water law is specified as a distance of at least 500m between wells. In some cases some new informal rules have been developed, for example regarding the purpose for which the water may be applied, who is allowed to use it, and embargo zones.
- Subsurface flow: Subsurface flow is the water in-between the surface water and the groundwater. Any physical interference, for example through the construction of impermeable structures in ephemeral streams, may have large impacts on the available surface and groundwater downstream. Nevertheless, this source is often overlooked and consequently, no formal water rights or allocation rules have been formulated for subsurface flow.

Pluriformity of conflict resolution mechanisms

With regard to conflict resolution mechanisms, a main observation is that there are multiple mechanisms (traditional and formal), however they are individually and collectively too weak to address the risk and outbreak of conflict, mainly for the following reasons:

1. Public confidence in the fairness of the courts and the waning of traditional leadership, which has been compromised by the political developments over the last 10 to 20 years, e.g., due to complex nepotism and a system of patronage;
2. The lack of enforcement of any type of law by official institutions, such as the National Water Resource Authority (NWRA) and the courts.

The legal system is pluriform and disjointed; contradictions exist between the various sources of law and legal references (formal law, traditional law, agricultural traditions), as well as within the formal body of law. There are contradictions between, on the one hand, the civil code and the traditional rights (which are broadly in line), and the Constitution and the water law (which are in line), on the other.

A negative consequence of fragmentation is that this often leads to contradictions between approaches in the regulatory framework, which is likely to decrease the possibility to resolve conflicts in practice. A positive implication of the fragmentation is that the pluriformity of conflict settlement mechanisms allows stakeholders to jointly select legitimized mediators/arbitrators, which creates possibilities to settle conflicts without violence in a context where different stakeholders distrust many local and national authorities.

The legacy of former President Saleh

For 33 years, President Saleh strengthened his power by strategically using 'divide and rule tactics' to weaken possible opposition. He created a complex system of nepotism and patronage, in which checks and balances could not be properly enforced (e.g., courts were structurally under-financed). These organisations were affected in one way or another by elites that possessed power due to their proximity to the regime.

On the one hand, Saleh deliberately co-opted sheikhs to secure tribal loyalty, which increased the dependency of sheiks on the Government. On the other hand, Saleh divided tribes and stimulated tribal conflicts by, for example, appointing local individuals as sheikhs, who are often without status or experience in customary law or tribal traditions. This undermined the authority of authentic sheikhs and created competition and divisions

along tribal lines. Consequently, many sheikhs became more concerned with power and money than with their communities. The authority of sheikhs further declined as a result of the 2011 revolution.

As a result from the divide and rule tactics, a general lack of trust in officials, traditional and formal institutions, and the available information exists across the country. Although the Saleh regime apparently collapsed as a result of the revolution, the political economy has remained concentrated within the same elite families. The revolution contributed to the overall weaknesses of state organizations and have also divided and weakened the traditional mechanisms by creating more diversity and politicization. Water management in general has benefitted Yemeni elites to the detriment of society at large, while the lack of accountability has led to the unsustainable exploitation of water.

The stakeholders in water related conflicts

The main stakeholders in water conflicts are the rural and predominantly agricultural water users. As wealth is important in the development of water resources, the poor (and women) are unequally affected by the created water shortages. In all the cases, women do not have any specific rights when it comes to water, but carry major responsibilities, both domestically and in relation to income generation. Farmers in general have very little knowledge of the existence of official authorities and law that govern water use. Their immediate concern is with the diesel fuel costs and its availability in the market. The price of oil will likely become more important in determining water access.

The current lack of the rule of law creates opportunities for individual sheikhs and other powerful individuals to garner wealth through claiming new land and water resources without being confronted by local resistance. In this study, newcomers were perceived to enter the areas and start using, diverting and drilling water for multiple purposes, which affected the prior use of existing (downstream) communities. Most respondents felt that they are increasingly oppressed by a system of corruption in which local elites, external powerful actors, and governmental officers are in control over water. The relations between the private and public spheres are very complex, as many private individuals hold public offices at the same time. This complexity is enlarged by the pluriformity of regulatory and legal institutions (state, tribal, customary, and religious). Overall, stakeholder constellations and their power relations in Yemen water conflicts are highly dynamic.

Conflict causes

The interview reports of the different case studies in Sana'a, Wadi Seham and Ta'izz provide a detailed view of how various stakeholders deal with the water-related conflicts in practice. The water conflicts are described briefly in the table below. A more detailed summary is included in Annex 8, which provides an overview of the local conflicts in each case study, the applicable traditional and customary rules, whether formal law plays a role, the outcome of each case, and also states the main problems as identified by the interviewees in each case study.

Case 1	Sana'a: Shakik Dam
Parties	Shakik village verus Tan'im village
Conflict	The conflict concerns the user rights of the lake water, the amount and share of each village to the lake water, as the land was formerly common land. The people of Tan'im started using pumps to withdraw water from the lake, as they claimed that the dam prevents the flood and baseflow from reaching their area. The conflict began after warnings from the Shahik people were ignored.

Case 2	Sana'a: Arrowdah
Parties	A new land owner who established a grape farm versus older land owners in the town of Ber Julah/ Arrowdah
Conflict	The grape farmer diverted water from a flood to irrigate his land, thereby violating traditional arrangements regarding the use of the flood according to the Ber Julah landowners, as they were the older landowners.
Case 3	Sana'a: Bani Matar
Parties	Upper stream village of Galal versus lower stream villages (Al Kharabat, Mahiab, Bait Awad and Bait Habes)
Conflict	The Galal village dug wells for drinking water at the upper location of the Ghail Mahiab stream. The lower stream villages claim that the digging of these wells was the main reason that some of their wells stopped producing water, thus loosing their main water source for drinking and irrigation.
Case 4	Wadi Seham: Al Dabashia canal
Parties	Person 81 and others versus Tehama development Authority (TDA) and downstream farmers
Conflict	The TDA wanted to extend the Debashiya canal in order to reach the farms previously left out by the project. Person 81, whose land is already at the end of the canal, is against prolongation as he fears that the water in the canal will decrease. Therefore he blocks the water flow to downstream users.
Case 5	Wadi Seham: Person 82 vs Person 83
Parties	Person 82 and his family versus Person 83 and others
Conflict	Person 82 and his family diverted the flow of the canal to its own land by using sand bags, in coordination with the TDA, as their land could not be sufficiently irrigated due to a new road that was built parallel to the main canal. Person 83, a farmer from the lower land, did not agree with this and kept on removing the bags, also using aggression at some point.
Case 6	Ta'izz: Shararah in Arrahedah, Demna District
Parties	Villagers of Shararah area with access to a well for drinking water versus Abduljabar's sons from a village up the stream
Conflict	Persons 92 dug a well up the stream. The villagers were afraid that this would affect the supply of their own well. Therefore, they reported it to the local authorities and to the NWRA. Actions were taken, but Persons 92 kept on digging their well.
Case 7	Ta'izz: Bani Yousof Water conflict, Almawasit district
Parties	The people of the Qihaf village versus People of the Uqf village
Conflict	The people of the Qihaf village decided to pump water from down the wadi/well into their village. The people of the Uqf village living on the other side of the wadi started drilling wells close to the Qihaf well, in search of water. This happened too close to the well of the Qihaf villages, resulting in action being taken by the Qihaf villages, including paying for security personnel and informing the prosecutor.
Case 8	Ta'izz: AlHoroor
Parties	Person 94 (local sheikh, also qat farmer) versus Qassem family (allround farmers)
Conflict	The main problem is random well drilling in the area and decreasing water levels

	in existing wells. Qassem attempted to dig a well higher in the valley than Person 94's well. Person 94 did not agree with this, and eventually took the case to court several times. Each time the case was won by Person 94, albeit with contradictory statements of the NWRA in Taizz and Sana'a. Furthermore, the Qassems still pushed their objectives, and the conflict remains unresolved.
Case 9	Ta'izz: Quaradha and Al Marzuaah village
Parties	Qurada village versus Marzooh village
Conflict	The conflict concerns the share of water produced by springs, with the two villages located on each side of the wadi. An assigned government committee ruled on the division of the water that was saved in special tanks, but Quradha village refused to acknowledge this ruling on several occasions. After 2011, the Quradha villagers decided to take control of the springs and divert the tankwater to their side, leaving the people of Marzooh village without tankwater.

Third party interventions

If conflicting parties are unable to settle the conflict, a third party can be invited to settle the conflict. Due to the pluriformity of legal institutions, this third party can be a state actor (courts, judges, etc.), tribal and customary institutions (sheikhs, wise elderly, etc.), or religious actors (religious leaders).

A distinction needs to be drawn between non-violent water conflicts, which relate to the access and use of water, and water conflicts that became violent resulting in the loss of life. Non-violent water conflicts are approached differently under traditional and formal law than the latter. According to a participant of the consultation workshop, conflicts over water alone are not considered to be important enough to unite a tribe and organize a response against the perpetrator. It only becomes an issue for the whole tribe if people are killed in the conflict.

Generally, the customary and traditional rules govern the resolution of water-related conflicts. Tribal conflict resolution includes mediation and arbitration practices. The practices are bound by certain protocols with different levels of sophistication. Sheiks are key tribal figures that should have the knowledge of the traditional rights and skills to lead such processes. However, the capability of the local traditional leaders to deal with the conflicts is deteriorating. They either lack knowledge, or their involvement in patronage systems prevents them from operating in the service of their community.

Almost all of the water-related civil court cases concern illegal drilling cases identified by the branches of the NWRA. Actual water conflicts are seldom brought to civil court for a number of reasons. Firstly, generally speaking faith in the fairness of the courts is limited, due to corruption and the politicisation of officials. In addition, although traditional arbitration is also costly to conflicting parties, the cost of settling a conflict in through judicial means is in many cases considered to be too high, which prevents people from seeking justice through the legal system. Consequently, most of the cases are resolved within the local communities according to local traditions, as these are familiar to and relatively more affordable for a large group of people.

Water-related conflicts involving killings and are brought before the criminal court, provides an indication for the occurrence of water conflicts in Yemen. According to an unpublished estimate, based on the criminal court cases, each year 2,500 people die as a result of a water-related conflict. Approximately one-third of the cases brought before the criminal court (and thus involve killings) are water-related cases.

Increasingly non-traditional mediators are involved in dispute resolution. These are governmental actors (NWRA specialists, court judges in an advisory role, district authorities), relatives of the conflicting parties, and local NGOs. Where government actors are called in to mediate in disputes, the actors are mainly municipal or district authorities or the NWRA. The roles of these governmental actors are, however, sometimes contradictory and never decisive. The authorities play an advisory role, but limited capacity (financial, personnel, knowledge, policy instruments, authority and legitimacy) restricts their impact. A judge might provide advice, in the situation when the cause of a conflict (such as deep-well drilling) is out of the scope of the tribal dispute settlement system. A judge may, however, interprete the Shari'ah to reach a solution acceptable to both parties, based on for example analogies in the Shari'ah.

There are several challenges all arbitrators and mediators currently face:

- Local leadership is based on personal leadership capacity, rather than formal authority. This can cause rapid shifts in authority and power constellations when, for example, old leaders pass away.
- In most cases there is no clear leadership, also because leadership configurations are still in the process of resettling local power.
- In many areas there is no single leadership strong enough to take authoritative decisions. This not only has implications for the leadership within a tribe (with regard to water issues), but also in a context where there is little trust; finding a mutually trusted mediator or arbitrator can be difficult.
- An important condition for conflict resolution is that the third party is perceived as legitimate by both parties in order to settle the conflict.
- A main challenge, therefore, is how to garner a critical mass of local stakeholders to support a decision of a third party mediating the conflict.
- Conflict resolution is mostly the outcome of processes of negotiation, mediation and conciliation that are rooted in an in-depth understanding of the conflict resolution traditions, geo-hydrological, social-economic, cultural and political conditions. The ability to come to sustainable agreements is, therefore, largely influenced by the mediator or arbitrator's knowledge of these subjects.

Sustainability of dispute settlements

Although some conflict cases were characterized by violence, most of the stakeholders do not have an interest to resort to violence as a means to forcefully settle a conflict. It is likely that the outcome of such an activity brings too much uncertainty and comes with too high a cost to be a means for settling a conflict over water. However, peaceful settlements are not always perfect in the long run, as they do not always address the root causes of a conflict, but rather prevent the conflicts from escalating. Therefore, when a situation changes (physical changes, changes in authority, etc.) existing arrangements might proof fragile.

A further complication is that water-related conflicts are not monitored in Yemen. Moreover, conflicts are often too complicated to be solved by sheikhs or the legal system alone; in most cases there is no single authority that can resolve the issues. As information on and knowledge about the water resources and flows is in most cases is limited, the parties are hampered in their ability to make sound agreements on more sustainable water resource use. Consequently, the stakeholders and third parties prioritize satisfying quarrelling parties, but not the sustainable management of the resource.

Recommendations

Through the National Dialogue, Yemen has started the process of formulating a new constitution based on six regional states. At the same time, there is a risk of further fragmentation and parallelism. Nonetheless, the new political landscape may also offer an opportunity to strengthen local management and power constellations.

Awareness raising, capacity building and information exchange

People do not always adhere to law, rules and regulations, especially those being introduced from outside their community. Rules require enforcement and legitimacy. Legitimacy depends on trust and trust is built by accountability, transparency and fairness of rules and procedures (predictability). As traditional rules continue to play an important role, it is recommended to support the debate on how to accommodate the traditional values in the challenging requirements of the near future. This includes a better understanding of the state of affairs with regard to the current water needs and future requirements.

Regarding the water system:

1. Support local knowledge exchange within the water system (basin). For example, support the farmer-to-farmer exchange of good practices over the regulation of groundwater.
2. Strengthen initiatives that make data (e.g., on agro-climate data and retail prices of agricultural produce) publicly available (e.g., through example mobile phones).
3. Qat production is a very important source of income. A strategy aiming to diminish the amount of qat should focus on the demand and production sides. Raising awareness on the health and environmental impacts can help reduce the demand. Whereas on the production side, farmers should be assisted with growing alternative sustainable cash crops, such as almond trees. This requires market chain development and commitment from donor countries, to address *inter alia* escalating tariffs and other restricting rules.

Regarding the current water rules and responsible authorities:

4. Support the documentation of traditional water use and access rules (of surface, subsurface flow and groundwater). By further detailing the link between the rules and the use of water, traditional knowledge can be better integrated in the facilitation of court decisions, thereby increasing local acceptance.
5. Ordinary agricultural users do not seem to have an understanding of formal water use regulations. The applicable rules and their rationale should be explained to the agricultural users in a way that complies with traditional approaches and values (see previous point). Awareness-raising campaigns can help to improve their understanding of the law, and the possible impact of existing water consumption practices (such as the impact of barriers in ephemeral water distribution systems).

Regarding conflict prevention and resolution:

6. Awareness on the impact of water use on water shortages (and conflict) is often lacking. Stakeholders need to be better informed about processes and trends regarding water systems, and how these may lead to problems and conflicts. Increased awareness might reduce the conflict potential. Therefore, it is suggested to develop and support regional and subnational workshops on this topic. In addition, use social media (e.g., radio, Facebook, etc.) to spread outcomes of such debates and research findings to a larger audience. Ask influential people (such as the mosque sheikh, village leaders etc.) to address their communities on these topics.

7. The connection between local and national authorities should be improved; NWRA should open local offices at the district level to work with local authorities on conflict prevention. These local NWRA offices should be provided with enough capacity to respond to problems and work with district authorities and security forces to intervene.
8. By documenting the local agreements on how conflicts are and should be resolved, the local institutional memory can be strengthened. Such a documentation system is, however, likely to be influenced by the most powerful, and should, therefore, be subject to a regular open review process.
9. Governmental staff, including judges and public prosecutors, should be trained in the use and enforcement of existing legal instruments. They should be instructed on the norms and traditions of agricultural conditions prevailing in each area to ensure that they can harmonize the legal codes with the customs as to increase the acceptance and enforcement of the rule of law.
10. Monitor and evaluate the practice of local water-related conflict resolution and the developments in local laws and regulations. Next, identify options to improve conflict resolution mechanisms.

Strengthening collective choice arrangements

Water conflicts in Yemen are too complicated to be solved by sheikhs or a legal system alone. In most cases, there is no authority that can resolve the issues. As information on and knowledge of the water resources and flows in most cases is limited, the parties are hampered in their ability to make sound agreements on more sustainable water resource use. Accordingly, the stakeholders and third parties prioritize satisfying quarrelling parties, rather than the sustainable management of the resource.

11. For the short, medium and long-term one of the key priorities and challenges for water management in Yemen is the strengthening of collective choice arrangements, as a proven institutional design principle for conflict prevention, resolution and sustainable management of water resources. Building upon on earlier empirical work in Yemen and other parts of the world, as well as theoretical notions from relevant literature, it is suggested that a set of ten institutional design propositions for conflict prevention, resolution and sustainable management of water resources in Yemen (see table 11.2) should be implemented. These institutional design propositions support a ‘‘management as learning’’ approach to dealing with complexity and uncertainty. They do not specify blueprints, but encourage sustainable water management tuned to the specific features of local geography, ecology, hydrology, economies, political situations and cultures.
12. Before steps can be taken to reinforce local capacity, a baseline assessment of the current problems and limitations is essential. Issues that should be identified include the clarity and strength of mandates, institutional boundaries, capacities, tasks, roles, responsibilities, interests and involvement of all relevant stakeholders. The possibility of the elite captures, as being observed within current Water User Associations or Basin Committees, should explicitly be avoided. Proven methods exist to avoid elite capture during collective choice sessions and independent operation of the committee (ranging from protocols for decision making to making unwanted behaviour publicly known), but all possible solutions should be made to measure.
13. For the institutional design it is recommended to identify and (further) develop appropriate tools and instruments for:
    a. monitoring and evaluation,
    b. graduated sanctions,
    c. collective choice arrangements with broad and horizontal stakeholder participation (e.g. involving respected elderly people who know about traditions),

d. equal and fair (re) distribution of costs,
e. benefits and risks, and
f. conflict prevention and resolution mechanisms

14. For all these institutional elements, all parties (i.e., the donor community, Yemeni government, civil society, etc.) have to be aware that it is crucial to develop context-specific arrangements. These arrangements should take into account the environment in which local authorities and WUAs have to operate, focusing on effective cooperation between them, the required capacity building and training of staff, joint information production and exchange, how to deal with corruption, and how to provide a positive incentive structure, which stimulates accountability and responsiveness.
15. When common-pool resources involve the interests of multiple stakeholders, as in the case of larger (cross-border) river basins or groundwater systems, an additional design principle needs to be added in order to lay the foundation for a more robust governance system; local parties only tend to address the local issues, whereas national parties only tend to address the national priorities. In the case of boundary crossing common pool resources, both the local and national voices need to be included in decision-making. Therefore, multi-level collective governance is needed. As collective governance does not emerge spontaneously, it should be built upon traditional governance structures, rather than (new external) state structures, with active facilitation and promotion.
16. Furthermore, a river basin approach can be developed and implemented step-by-step. In the first step a river basin approach can be used to gather data on water rights, current usage and interventions that might have an impact on the availability and distribution of water (e.g., check-dams, deep wells). Projecting these figures onto the physical and socio-economic change can help to identify the sources of conflict, as well as conflict solutions.

Support for the Rule of Law

If traditional approaches succeed in maintaining and regaining their legitimacy, they provide an entry point for strengthening the rule of law in the longer term. Already, in some areas the traditional system partially filled the institutional vacuum created since 2011 and provided adequate solutions. The traditional rule system is a flexible system and may adapt, as circumstances require: in response to the requirements of the situation, new rules and practices have been created. Within this research on some occasions, the outcome of a conflict seems to result in the establishment of new rules to govern the practices (well spacing, common ground, common water resources, etc.). It is, therefore, recommended to support the traditional and formal rule, by combining their strengths.

17. Assist the development of a fund to support access to courts for the poorer populations of Yemeni society. Needless to say, the necessary safeguards should be put in place to prevent capture of resources.
18. Develop mobile water courts for water related conflicts. Mobile courts, not necessarily related to water conflicts, have been recommended before and attention should specifically be given to their susceptibility of corruption. Alongside these court rulings, these mobile courts should provide education on the applicable laws and provide technical advice in relation to water issues (thereby facilitating conflict resolution outside the courts). In this manner, the gap between formal law and traditional law can be bridged (and the legitimacy of the court rules can be improved) and justice is made accessible, even for the most disadvantaged groups. Mobility of the courts has also the advantage that political-economic connections of a 'crony capitalist

nature' (that provide opportunities for rule, self-enrichment and prestige) have less impact on the objectivity and legitimacy on court rulings.

19. Support an independent evaluation on the role of donors on water management and the potential for conflict.
20. A strategy needs to be developed that outlines practical first responses to disputes over water. The strategy should be drafted with participation from one the sheikhs, the NWRA offices,the governors' office, the district directors, and last but not least. prosecution officers, and local judges and user groups. As part of the strategy, a clear communication system needs to be drawn among the different government entities involved.
21. The existing laws need to be operationalised over a longer period of time, especially the Water Law of 2002 and the By-Law of 2011, that contain strong provisions to regulate all matters relating to water use, distribution, and the prioritisation in the access to it. Operationalisation requires learning lessons from their current lack of impact.
22. There is a need to strengthen the capacity of third parties actors in resolving conflicts. For example, by providing a training in traditional and formal legal principles of water distribution and conflict resolution. Possible actors are NWRA, WUAs, and local government actors. Currently, individuals within these organisations often act on a personal account.
23. Stimulate the embedding of mediation approaches in the current legal system as a recognised approach.
24. There is also a need to better codify the water rights and rules, which supports the differentiation between surface water, subsurface flows, and groundwater (without loosing the necessary interlinkages):
    a. For example, clear regulations need to be drafted for the distance by which water can be transferred from its source, and the quantities of water allowed to be pumped for irrigation purposes.
    b. Another example is that surface (spate) water allocation rules have been formulated for several ephemeral rivers, yet they are in many cases out-dated as they did not accommodate for the presence of permanent structures or the effect on recharge and hence the availability of drinking water.

Executive Summary (Arabic)

ملخص تنفيذي

عن المشروع

يهدف المشروع الى تطوير توصيات سياسة وثيقة الصلة وتقديمها الى السفارة الهولندية في صنعاء، اليمن، لمنع وحل الصراعات المتعلقة بالمياه، من خلال تقييم الاقتصاد السياسي لحوكمة المياه اليمن.

حوكمة المياه هي عملية معقدة وسياسية فى جوهرها ولديها قدرها مفترضة على تغيير اللعبة: قد تمنع ازمة مياه حادة اندلاع صراع عنيف واسع النطاق او قد تزيد من تفاقم الوضع. تشكل ندرة المياه تهديد للأمن الانساني. حسب تقديرات غير رسمية ، يموت 2500 شخص كل عام كنتيجة لصراعات مرتبطة بالصراع حول المياه. لذلك تبرز الحاجة لاستراتيجيات وقاية وتكيف على المستويات المحلية والاقليمية والوطنية تكون مبنية على فهم قوي للمصادر المتعددة لغيات الامن، والترابط بينها وامكانية الصراع التراكمي لها.

قضايا المياه معقدة بسبب ارتباطها المعقد مع قضايا متعددة داخل المجالات الطبيعية والمجتمعية. يجب ان تأخذ حوكمة المياه بعين الاعتبار الشكوك الناتجة عن المعلومات الناقصة، الشكوك الناتجة عن اراء متضاربة حول المشاكل وحلولها الممكنة، والسلوك الغير متنبأ به للأنظمة الطبيعية، والاجتماعية والاقتصادية والسياسية.

فى هذا المشروع، قمنا بتطوير اطار تحليلي لتحليل الاقتصاد السياسي وابعاد الصراع لحوكمة المياه في اليمن. المكونات الرئيسية لهذا الاطار هي:

1. السياق والتغيرات السياقية: كيف تكون الصراعات جزءا لا يتجزأ من السياقات المحلية والطبيعية والاجتماعية والاقتصادية والسياسية والقانونية والمؤسساتية؟ هل تقلل هذه السياقات و تزيد من الصراع أو تشكّله وتوزعه ؟ هل تسببت تغيرات الظروف فى نشوء الصراع؟
2. تحليل اصحاب المصالح: من هم اصحاب المصالح ذوي العلاقة فى الصراع؟ ماهي مصالحهم؟ ما هي الممارسات التى يستخدموها لخدمة مصالحهم؟
3. اليات تنظيم الصراع. ما الحلول التي تم اختبارها لمعالجة الصراع ولماذا ؟ ما هي الحلول التي لم يتم تجربتها؟

اجرى خبراء محليون مقابلات فردية معمقة ونقاشات جماعية حول تسع صراعات حقيقية فى ثلاث مناطق فى اليمن. تم اختيار المناطق لتمثل مقطع عرضي للسياقات الجيو-مائية والاجتماعية والاقتصادية المختلفة:

- التنافس على المياه الجوفية في المناطق المرتفعة (حوض صنعاء)،
- الصراعات على المياه السطحية في الانهار سريعة الزوال (وادي سهام)،
- التنافس الشبه-حضري (تعز).

النتائج

ادارة المياه في اليمن

تعاني اليمن من تاريخ طويل من شح المياه، أدى الى وضع أسس لعادات وتقاليد زراعية لتنظيم توزيع المياه، وصيانة البنية التحتية للري، وآليات حل الصراع. في المناطق التي اجري البحث عليها، يعتمد الناس اساسا على القواعد التقليدية (العرف) والاتفاقيات الأخرى لتنظيم الحقوق والقيود المتعلقة بالوصول الى المياه، واستخدامه وتوزيعه. هذه الاعراف ليست مكتوبة وهي خاصة بالمناطق المغطاة بالتقييم حيث يمكن ان تكون هناك اعراف اخرى خارج هذه المناطق. تهتم القواعد الخاصة بهذا التقييم بثلاثة مصادر للمياه:

- المياه السطحية (الفيضانات): هناك قيود تتعلق بتوزيع المياه، ولكنها في كثير من الحالات قديمة لأنها لا تستوعب البنى الدائمة (راجع السدود) واثر هذه البنى على تغذية المياه الجوفية وتوفير مياه الشرب.
- المياه الجوفية: لا توجد اعراف محددة للمياه الجوفية ليست تاريخية ، مع انه في كثير من الحالات تستخدم قاعدة المسافة، حيث تحدد ب 500 م في قانون المياه كحد ادنى بين الابار. في بعض الحالات تم تطوير بعض الاعراف الجديدة، على سبيل المثال تطبق القاعدة على اساس غرض استخدام المياه، ومن يسمح له باستخدامها، ومناطق الحظر.
- الجريان شبه السطحي: الجريان شبه السطحي هو المياه الموجودة بين المياه السطحية والمياه الجوفية. اي تدخل طبيعي، على سبيل المثال من خلال بناء هياكل غير منفذة في جداول سريعة الزوال/ قد يكون لها اثر كبير على توفير المياه السطحية والجوفية باتجاه المصب. ولكن بالمقابل، غالبا ما يتم اهمال هذا المصدر نتيجة صياغة حقوق مائية رسمية او قواعد توزيع للجريان شبة السطحي.

تعدد اشكال اليات حل الصراع

فيما يتعلق باليات حل الصراع، الملاحظة الرئيسية هي ان هناك اليات متعددة (تقليدية ورسمية)، ولكنها ضعيفة جدا سواء كانت فردية ومجتمعية لمعالجة خطر واندلاع الصراع، وذلك يعود بشكل اساسي للأسباب التالية:

1. ثقة العامة في عدالة المحاكم وتراجع القيادة التقليدية، والتي يتم اضعافها من قبل التطورات السياسية في السنوات العشر الى عشرين الماضية ،مثلا، بسبب نظام المحسوبية والمحاباة
2. غياب تطبيق اي شكل من اشكال القانون من قبل المؤسسات الرسمية مثل هيئة مياه الريف، (نورا NWRA) والمحاكم.

ان النظام القانوني مفكك ومتعدد الاشكال : توجد تناقضات بين المصادر المتعددة للقانون والمرجعيات القانونية (القانون الرسمي، القانون التقليدي، التقاليد الزراعية) بالإضافة الى تلك الموجودة داخل المؤسسة الرسمية للقانون. هناك تناقض من جهة بين القانون المدني والحقوق التقليدية (وهي غالبا في صف واحد) ، ومن جهة اخرى بين الدستور وقانون المياه (وهما في صف آخر).

ان النتيجة السلبية للتقسيم تكمن في أنها هذا غالبا تؤدي الى تناقضات بين المناهج في الاطار التنظيمي، والذي من المحتمل ان يقلل امكانية حل الصراع على ارض الواقع. احد المضامين الايجابية للتقسيم هي تعدد اشكال اليات تسوية الصراع والتي تسمح لأصحاب المصالح ان يختاروا بشكل مشترك الوسطاء الشرعيين/المحكمين، والذي يخلق فرص تسوية النزاعات بين الاطراف دون عنف في سياق حيث لا يثق مختلف اصحاب المصالح بالسلطات المحلية والوطنية.

ارث الرئيس السابق علي عبدالله صالح

لمدة 33 عام، عزز الرئيس صالح قوته من خلال الاستخدام الاستراتيجي " لتكتيك فرق تسد" من اجل اضعاف المعارضة المحتملة. لقد خلق صالح نظام معقد من المحسوبية والمحاباة، والذي يجعل من الصعب فرض الضوابط والتوازنات (مثلا، المحاكم دائما تعاني من نقص فى التمويل). تم التأثير على هذه المؤسسات بطريقة او اخرى من قبل النخبة من خلال امتلاكهم للسلطة بسبب قربهم من النظام.

من جهة، قام الرئيس صالح بتعمد اختيار شيوخ لضمان الولاء القبلي – والذي زاد اعتماد الشيوخ على الحكومة. من جهة اخرى، قسم صالح القبائل واثار الصراعات القبلية من خلال، مثلا، تعيين افراد محليين كشيوخ، الذين لم يتمتعوا بمكانة او خبرة في القانون العشائري او التقاليد القبلية. ادى ذلك الى تقويض سلطة الشيوخ الحقيقيين وخلق تنافس وانقسامات بين وداخل القبيلة. بالنتيجة، اصبح اهتمام الكثير من الشيوخ بالمال والسلطة أكثر من اهتمامهم بمجتمعاتهم. لكن سلطة الشيوخ تراجعت اكثر بعد ثورة 2011.

وكنتيجة لسياسة فرق تسد، ظهرت هناك خلل عام في الثقة ب لمسؤولين، والمؤسسات الرسمية والتقليدية، والاعلام. وعلى الرغم من الانهيار الواضح لنظام صالح كنتيجة للثورة، استمر الاقتصاد السياسي بشكل رئيسي بين عائلات النخب ذاتها. ساهمت الثورة في الضعف العام لمؤسسات الدولة وادت ايضا الى تقسيم واضعاف الاليات التقليدية بواسطة خلق تنوع وتسييس اكثر. استفادت هذه النخب من ادارة المياه على حساب المجتمع ككل في حين أدى غياب المحاسبة الى الاستغلال الغير محتمل للمياه.

اصحاب المصالح في الصراعات المتعلقة بالمياه

ان اصحاب المصالح الرئيسيين في صراعات المياه هم المستخدمون القرويون والزراعيون. ولان الثروة مهمة في تطوير موارد مياه. فان الفقراء (النساء) يتأثرون بشكل غير عادل بنقص المياه الحاصل. في كافة الحالات، لا تتمتع النساء بأية حقوق محددة عندما يأتي الامر الى المياه، ولكنهن يحملن مسؤوليات جسيمة، منزليا وفيما يتعلق بتوليد الدخل. بشكل عام لدى المزارعين معلومات قليلة بوجود سلطات رسمية وقانون يحكم استخدام المياه. قلقهم المباشر هو كلف الوقود والديزل وتوفرها فى السوق. كما هو من المحتمل ان تصبح اسعار النفط مؤشرا اكثر اهمية في تحديد الوصول الى المياه.

يخلق الغياب الحلي لسيادة القانون فرص لبعض الشيوخ والافراد المتنفذين لجني الثروة من خلال ادعاء امتلاك موارد مياه وارض جديدة دون ان تواجههم اي معارضة محلية. في هذه الدراسة، تم النظر الى القادمين الجدد لدخول المناطق البدء باستخدام، وتحويل مسار، والحفر لاستخراج المياه لأغراض متعددة، والذي اثر على الاستخدام المسبق لمجتمعات (المصب) الموجودة. شعر معظم المستجيبين انهم يتعرضون للقمع بشكل متزايد من قبل نظام فاسد حيث النخبة المحلية، والفاعلين المتنفذين بالاضافة الى المسؤولين الحكوميين الذين يتحكمون في المياه. ان العلاقات بين القطاعين العام والخاص معقدة جدا، حيث معظم الافراد في القطاع الخاص لديهم وظائف حكومية. يتسع هذا التعقيد بسبب زيادة اشكال المؤسسات التنظيمية والقانونية (الدولة، القبلية، العشائرية والدينية). بشكل اجمالي، تعتبر تكتلات اصحاب المصالح وعلاقات السلطة بينها في صراعات المياه في اليمن نشطة جدا.

اسباب الصراع

تقدم تقارير المقابلات الخاصة بدراسة الحالات المختلفة فى صنعاء، ووادي سهام وتعز وجهة نظر مفصلة للطرق المختلفة التى يتعامل بها اصحاب المصالح المتعددين مع الصراعات المتعلقة بالمياه فى في الممارسة العملية . فى الجدول ادناه وصف مختصر لصراعات المياة .هناك ملخص اكثر تفصيلا فى ملحق 8، حيث يقدم نظرة عامة ملخصة للصراعات المحلية فى كل حالة دراسية، والقوانين العشائرية والتقليدية المطبقة، سواء كانت القوانين الرسمية تلعب تؤدي دورا في ذلك، ونتائج كل حالة، كما يذكر المشاكل الرئيسية كما حددها الاشخاص الذين اجريت معهم المقابلات فى كل حالة دراسية.

الحالة 1	**صنعاء: سد الشيخ**
الاطراف	**قرية شاهق مقابل قرية تنعيم**
الصراع	**يخصص الصراع حقوق المستخدمين لمياة البحيرة، كمية وحصة كل قرية فى مياة البحيرة، كون الارض كانت مشاع فى السابق. بداء سكان قرية تنعيم استخدام المضخات لجر المياة من البحيرة، كونهم ادعوا ان السد يمنع الفيضان والجريان السطحي من الوصول الى منطقتهم. بدا الصراع بعد تجاهل تحذيرات من قرية شاهق.**

الحالة 2	**صنعاء: الروضة**
الاطراف	**مالك جديد لارض حيث أنشأ مزرعة عنب مقابل مالكين قديمين لارض فى قرية بير جولة / الروضة**
الصراع	**قام مالك مزرعة العنب بتغيير مجرى مياه من فيضان لري ارضه، منتهكا بذلك الترتيبات التقليدية المتعلقة باستخدام مياة الفيضان حسب مستخدمي اراضي بير جولة، كونهم مالكي الاراضي**

القدماء.

الحالة 3	صنعاء: بني مطر
الاطراف	قرية جلال فى اعلى مجرى المياة مقابل قرى المصب (الخرابات، مهياب، بيت عوض وبيت حابس)
الصراع	حفر سكان قرية جلال ابار لمياة الشرب فى الموقع الاعلى لمجرى غيل مهياب. يدعى سكان قرى المصب ان حفر هذه الابار جفت، ولذلك يخسرون مصدر المياة الرئيسي للشرب والري.

الحالة4	وادي سهام: قناة الدباشية
الاطراف	الشخص 81 واخرون مقابل سلطة تطوير تهامة ومزارعي المصب
الصراع	ارادت سلطة تطوير تهامة توسيع قناة الدباشية من اجل الوصول الى المزارع المحرومة سابقا من المشروع. الشخص 81، الذي تقع ارضة فى نهاية القناة، معارض للتمديد لأنه يخشى ان تنقص المياة فى القناة. لذلك حجز تدفق مياة الفيضان عن المستخدمين في جهة المصب.

الحالة 5	وادي سهام: الشخص 82 مقابل الشخص 83
الاطراف	الشخص 82 وعائلتة مقابل السخص 83 واخرون
الصراع	قام الشخص 82 وعائلتة بتغيير جريان القناة الى اراضيهم باستخدام اكياس الرمل بالتنسيق مع سلطة تطوير تهامة، لان اراضيهم لم تروى بشكل كاف بسبب شق الطريق الجديدة والموازية للقناة الرئيسية. الشخص 83، وهو مزارع من المنظقة السفلى، لم يوافق على هذا واستمر بازالة الاكياس الرملية، باستخدام العنف احيانا.

الحالة 6	تعز: الشرارة في الرحيضة، مديرية دمنة خبير
الاطراف	سكان قرية شرارة الذين يستخدمون بئر لمياه الشرب مقابل ابناء عبدالجبار من قرية في اعلى

	المجرى
الصراع	حفر ابناء عبدالجبار بئر في اعلى المجرى. خشي سكان القرية ان يؤثر هذا على تغذية بئرهم. لذا اشتكوا للسلطات المحلية والى هيئة مياه الريف (نورا) حول هذا. تم اتخاذ اجراءات، ولكن استمر ابناء عبدالجبار في حفر بئرهم.

الحالة 7	تعز: صراع بنى يوسف على المياه، مديرية المواسيط
الاطراف	سكان قرية قحاف مقابل سكان قرية اقف
الصراع	قرر سكان قرية قحاف ضخ المياة من اسفل الوادي / البئر الى قريتهم. بداء سكان قرية اقف الذين يعيشون فى الجانب الاخر من الوادي بحفر ابار بالقرب من بئر قحاف، بحثا عن المياة. كان ذلك قريب جدا من بئرهم، اتخذ سكان قرية قحاف اجراءات، بما فيها دفع اموال لموظفي الامن وابلاغ المدعي العام.

الحالة 8	تعز: الحرور
الاطراف	الشخص 94عزاني (الشيخ المحلي، ومزارع قات) مقابل عائلة قاسم (المزارعين المجاورين)
الصراع	المشكلة الرئيسية هي الحفر العشوائي للابار في المنطقة وانخفاض مستويات المياه في الابار الموجودة. حاول قاسم حفر بئر اعلى من بئر عزاني في الوادي. لم يوافق عزاني على ذلك، وفى النهاية اخذ القضية الى المحكمة عدة مرات. كسب عزاني القضية في كل مرة. ولكن مع الاقوال المتناقضة من سلطة مصادر المياه الطبيعية في تعز وصنعاء ومع استمرار عائلة القاسم بمحاولة تحقيق اهدافهم، لا يزال الصراع قائم.

الحالة 9	تعز: قراضة وقرية مرزوح
الاطراف	قرية قراضة مقابل قرية مرزوح
الصراع	يدور الصراع حول حصة المياه من الينابيع، مع وقوع القريتين على جانبي الوادي. حكمت لجنة معينة من قبل الحكومة في تقسيم المياه التي تم تخزينها في خزانات خاصة، ولكن قرية قراظة رفضت الاعتراف بهذا الحكم في عدة مناسبات. بعد عام 2011، قرر سكان قرية قراظة السيطرة

على الينابيع وتغيير مجرى مياه الخزانات الى جهتهم، تاركين سكان قرية مرزوح بدون مياه.

تدخلات اطراف ثالثة

اذا لم يتمكن الاطراف المتصارعة من تسوية الصراع، يمكن ان تتم دعوة طرف ثالث لتسوية الصراع. وسبب تعدد اشكال المؤسسات القانونية فان هذا الطرف الثالث قد يكون طرف من الدولة (المحاكم، القضاة، الخ)، أوالمؤسسات العشائرية (الشيوخ، العقال، الخ)، او رجال دين (شيوخ دين).

يجب التمييز بين الصراعات المائية الغير عنيفة، والتي تدور حول الوصول الى المياه واستخدامها، والصراعات المائية التي اصبحت عنيفة والتي تسببت بخسارة ارواح. حيث يتم التعامل مع الصراعات المائية الغير عنيفة بطريقة مختلفة وفق القانون التقليدي والرسمي عما هو الحال في الصراعات العنيفة. وبحسب اقوال احد المشاركين في ورشة عمل استشارية، فان الصراعات حول المياه وحدها لا تعتبر مهمة بالقدر الكافي لجعل القبيلة تتوحد وتنظم رد ضد من يرتكب مخالفة. لكن فقط لا تصبح المسألة قضية بالنسبة للقبيلة بأكملها الا اذا قتل أشخاص في الصراع.

بشكل عام، تحكم القوانين العشائرية والتقليدية الصراعات المتعلقة بالمياه. يتضمن حل الصراع القبلي ممارسات الوساطة والتحكيم. هذه الممارسات محكومة ببروتوكولات معينة ذات مستويات مختلفة من التعقيد. يعتبر الشيوخ الشخصيات الرئيسية الذين يجب ان تكون لديهم المعرفة في الحقوق التقليدية والمهارات التي تقود مثل هذه العمليات. ولكن قدرة القادة التقليديين المحليين في التعامل مع الصراعات في تراجع. اما انهم يفتقرون الى المعرفة، او بسبب انخراطهم في انظمة المحاباة مما يمنعهم من العمل في خدمة مجتمعهم.

الغالبية العظمى من قضايا المحاكم المدنية المتعلقة بالمياه تدور حول حالات حفر غير قانوني تكتشفها فروع هيئة مياه الريف (نورا). نادرا ما تصل قضايا صراعات المياه الحقيقية الى المحاكم وذلك لعدة اسباب اهمها: هناك بشكل عام ثقة محدودة فى عدالة المحاكم، وبسبب الفساد وقيام المسؤولين بالتسييس. بالاضافة للكلفات العالية لتسوية النزاعات في المحاكم القانونية في الكثير من الحالات على الرغم أن التحكيم التقليدي هو ايضا عملية مكلفة للاطراف المتنازعة، وهو ما يمنع الناس من البحث عن العدالة فى النظام القانوني.

ان الصراعات على الماء المتضمنه القتل ي والتي تعرض امام المحكمة الجنائية تعطي مؤشرات عن حدوث الصراعات المائية في اليمن. وفقا لتقديرات غير منشورة، مبنية على قضايا المحكمة الجنائية، يموت 2500 شخص كل سنة نتيجة للصراعات المائية. ما يقارب من ثلث القضايا التي تنظر فيها المحكمة الجنائية (التي تتصمن القتل)هي قضايا بسبب الماء.

ينخرط الوسطاء الغير تقليديين وبشكل متزايد في حل الصراعات. عادة ما يكون هؤلاء الفاعلين الحكوميين (خبراء من نورا، قضاة محاكم لهم دور استشاري، وسلطات اقليمية)، واقارب الاطراف المتنازعة، بالاضافة الى منظمات المجتمع المدني المحلية. حين يتم استدعاء فاعلين حكوميين للتوسط في النزاعات، غالبا يكون الفاعلين سلطات بلدية او اقليمية او نورا. معظم ما تكون ادوار هؤلاء الفاعلين الحكوميين متناقضة احيانا وغير حاسمة.كما تلعب السلطات دور استشاري، ولكن قدرتهم المحدودة (المالية، الموظفين، المعرفة، ادوات السياسة، السلطة والشرعية) تقيد من اثرها. قد يقدم قاض نصيحة، في وضع عندما يكون سبب الصراع (مثل حفر بئر عميق) خارج نطاق نظام تسوية الصراع القبلي. وقد يفسر القاضي الشريعة ليأتي بحل مقبول للطرفين، على اساس مقارنات بأمثلة مشابهة للشريعة.

هناك عدة تحديات يواجهها كلا من المحكمين والوسطاء:

- القيادة المحلية تكون على اساس قدرة القيادة التشخيصية، اكثر من السلطة الرسمية. قد يسبب هذا انتقال سريع في السلطة وتكتلات السلطة عندما يتوفى القادة الكبار، على سبيل المثال،

- في معظم الحالات لا توجد قيادة واضحة، ايضا لان تكوينات القيادة لا تزال في مرحلة اعادة تشكيل السلطة المحلية.
- في مناطق متعددة لا توجد قيادة واحدة قوية بالقدر الكافي لتتولى اتخاذ قرارات موثوقة. لا يؤثر هذا على القيادة داخل القبيلة (فيما يتعلق بقضايا المياه) فحسب، ولكن حيث توجد ثقة قليلة، فان وسيط او محكم يثق به الطرفين يمكن ان يكون امرا صعب.
- احد الشروط الهامة لحل الصراع هو ان ينظر الطرفان المتنازعان الى الطرف الثالث كطرف شرعي من اجل تسوية الصراع.

- يصبح احد التحديات هو الحصول على الجماعة الحاسمة من اصحاب المصالح المحليين لدعم قرار طرف ثالث يتوسط في الصراع.

- حل الصراع هو غالبا نتيجة عمليات تفاوض، والوساطة والمصالحة المتجذرة في فهم متعمق لتقاليد حل الصراع، بالاضافة للظروف الجيو-مائية، والاجتماعية والاقتصادية، والظروف الثقافية والسياسية. والقدرة في الوصول الى اتفاقيات مستدامة يتأثر بشكل كبير بمعرفة الوسيط او المحكم في هذه المواضيع.

استدامة تسوية النزاعات

على الرغم من ان العنف يحدث في بعض حالات الصراع، لكن معظم اصحاب المصالح ليس لديهم اهتمام في اللجوء للعنف كوسيلة لتسوية الصراع بالقوة. من المحتمل ان نتيجة مثل هذا النشاط يجلب الكثير من الشكوك ويأتي بكلف اعلى من كونه وسيلة تسوية نزاع مائي. في المقابل، التسويات السلمية ليست دائما مثالية في المدى الطويل، كونها لا تعالج دائما اسباب الصراع جذريا ، ولكن فقط منع الصراعات من التصعيد. لذلك، عندما يتغير وضع ما (تغيرات طبيعية، تغيرات في السلطة، الخ) فان الترتيبات الموجودة قد تثبت هشاشتها.

احدى التعقيدات الاضافية هي ان الصراعات المائية ليست مرصودة في اليمن. غالبات ما تكون الصراعات اكثر تعقيدا من ان يحلها الشيوخ او النظام القانوني وحدة: في معظم الحالات لا توجد سلطة واحدة تستطيع حل القضايا. كون المعلومات والمعرفة في المصادر المائية والجريان في معظم الحالات محدودة، لذا تكونقدرة الاطراف مقيدة في صنع اتفاقيات سليمة حول استخدام اكثر استدامة لموارد المياه. بالنتيجة، اصحاب المصالح والاطراف الثالثة يضعون اولوية ارضاء الاطراف المتصارعة، بدلاً عن الادارة المستدامة للموارد.

توصيات

من خلال مؤتمر الحوار الوطني، بدأت اليمن عملية صياغة دستور جديد بناءا على اساس الاقاليم الستة. في الوقت ذاته يظهر خطرأبعد للتقسيم والتوازي. لكن المشهد السياسي الجديد قد يعطي فرصة لتقوية الادارة المحلية وتكتلات القوى.

رفع الوعي، بناء القدرات وتبادل المعلومات

لا يلتزم الناس دائما بالقانون، والانظمة والتعليمات، وخاصة اولئك القادمين من خارج مجتمعهم. تتطلب القوانين التطبيق والشرعية. تعتمد الشرعية على الثقة والتقه تبنيها المسائلة، والشفافية وعدالة القوانين والاجراءات (القدرة على التنبؤ). كما يواصل القانون التقليدي لعب دور هام، ينصح بدعم النقاش حول المحافظة على القيم التقليدية في تحديات المستقبل القريب. يتصمن هذا فهم افضل للوضع العام فيما يتعلق بالاحتياجات المائية الحالية والمستقبلية.

حول النظام المائي:

1. دعم تبادل المعلومات المحلية داخل النظام المائي (الحوض). على سبيل المثال، دعم تبادل الممارسات الجيدة بين المزارعين حول تنظيم المياه الجوفية.
2. تقوية المبادرات التي توفر البيانات (مثلا البيانات المناخية الزراعية واسعار التجزئة للمنتجات الزراعية)للعامة (من خلال الهواتف النقالة على سبيل المثال).
3. انتاج القات هو مصدر مهم للدخل. يجب ان تركز الاستراتيجية التي تهدف الى تقليل كمية القات على عوامل الطلب والانتاج. قد يساعد رفع مستوى الوعي حول الاثار الضحية والبيئية في التقليل من الطلب. ولكن في جانب الانتاج، يجب مساعدة المزارعين في زراعة منتجات بديلة تدر دخلا مستدام، مثل اشجار اللوز. يتطلب هذا تطوير سلسلة سوقية والتزام من الدول المانحة، لمعالجة قضايا الرسوم المتزايدة والقوانين المقيدة الاخرى على سبيل المثال.

حول القوانين المائية الحالية والسلطات المسؤولة:

4. دعم توثيق القوانين التقليدية لاستخدام المياه والحصول عليها (السطحية، والجريان الشبة سطحي والمياه الجوفية). من خلال التفاصيل الاضافية للرابط بين القوانين واستخدام المياه، يمكن ان تدمج المعرفة التقليدية بشكل افضل فى تسهيل قرارات المحاكم، وبالتالي تزيد القبول المحلي.

5. لا يبدو ان لدى المستخدمين الزراعيين الاعتياديين فهم للتعليمات الرسمية لاستخدام المياه. يجب شرح القوانين المطبقة ومبرراتها الى المزارعين بطريقة تنسجم مع الاساليب والقيم التقليدية (راجع النقطة السابقة). قد تساعد حملات رفع الوعي في تحسين فهمهم للقانون، وفي تأثير محتمل على ممارسات استهلاك المياه الموجودة (مثل الاثر على الحواجز في انظمة توزيع المياه سريعة الزوال).

حول منع وحل الصراع:

6. هناك نقص في الوعي حول اثر استخدام المياه على شح المياه (والصراع). يحتاج اصحاب المصالح ان يكون لديهم معرفة افضل حول العمليات والتوجيهات المتعلقة بأنظمة المياه، وكيف انها قد تؤدي الى حدوث مشاكل وصراعات. قد تؤدي زيادة الوعي الى تقليل فرص نشوب صراعات. لذلك نقترح تطوير ودعم ورش عمل اقليمية وشبه وطنية حول هذا الموضوع. بالإضافة الى ذلك، استخدام وسائل الاعلام الاجتماعي (الاذاعة، الفيسبوك، الخ) لنشر نتائج مثل هذه النقاشات ونتائج البحوث الى جمهوراوسع. الطلب من اناس مؤثرين (مثل خطباء المساجد، وقادة القرى) للحديث مع مجتمعاتهم حول هذه المواضيع.

7. لتحسين العلاقة بين السلطة المحلية والوطنية، يجب ان تفتح نورا مكاتب محلية على مستوى المحافظة للعمل مع السلطات المحلية حول منع الصراع. يجب ان تجهز هذه المكاتب بامكانيات كافية للاستجابة للمشاكل والعمل مع السلطات الاقليمية وقوى الامن للتدخل.

8. من خلال توثيق الاتفاقيات المحلية حول وضع الصراعات وكيفية حلها، فانه يمكن تقوية الذاكرة المؤسسية. من المحتمل من جهة اخرى ان يؤثر اصحاب النفوذ على مثل هذا النظام التوثيقي، ولذلك يجب ان يكون خاضعا لعملية مراجعة منتظمة ومفتوحة.

9. تدريب موظفي الحكومة، بمن فيهم القضاة والمدعين العموم، على استخدام وتطبيق الادوات القانونية الموجودة.بالاضافة الى تثقيفهم حول العادات والتقاليد الخاصة بالظروف الزراعية التي تسود فى كل منظفة لضمان انسجام الانظمة القانونية مع العادات من اجل زيادة قبول وتطبيق سيادة القانون.

10. مراقبة وتقييم ممارسة حل الصراعات المائية المحلية والتطورات في القوانين والانظمة المحلية. ثم تحديد الخيارات وتحسين اليات الصراع.

تعزيز ترتيبات الخيارات الجماعية

ان الصراعات المائية في اليمن اكثر تعقيدا من ان يحلها الشيوخ او النظام القانوي وحده. في معظم الحالات لا توجد سلطة واحدة تستطيع حل القضايا. كون المعلومات والمعرفة في المصادر المائية والجريان محدودة في معظم الحالات، فان قدرة الاطراف تكون مقيدة فى صنع اتفاقيات سليمة حول استخدام اكثر استدامة لموارد المياه. بالنتيجة، اصحاب المصالح والاطراف الثالثة يضعون أولوية ارضاء الاطراف المتصارعة، بدلا عن الإدارة المستدامة للموارد.

1. 11. بالنسبة للمدى القصير والمتوسط والبعيد، احدى الاولويات والتحديات الرئيسية لادارة المياة فى اليمن هي تقوية ترتيبات الخيارات الجماعية، كمبدأ تصميم مؤسسي مثبت لمنع الصراع، وحله والادارة المستدامة لموارد المياه. البناء على تجارب وخبرات سابقة في اليمن واماكن اخرى في العالم، بالإضافة الى الافكار النظرية من الأدبيات ذات الصلة، نقترح مجموعة

مكونة من عشرة مقترحات تصميم مؤسسي لمنع الصراع، وحله والادارة المستدامة لموارد المياه في اليمن (راجع جدول 11.2). تدعم مقترحات التصميم المؤسسي منهج " الادارة كتعلم" في التعامل مع التعقيدات والشكوك. لا تحدد خطط لكن تشجع الادارة المستدامة للمياه والتي تكون مكيفة حسب الخصائص المحددة للجغرافيا المحلية، البيئية، الاقتصاديات، والاوضاع السياسية والثقافات.

12. قبل اتخاذ خطوات لتعزيز القدرات المحلية، من الاساسي اجراء تقييم خط اساس حول المشاكل والقيود الحالية. تتضمن القضايا التي يجب ان تحدد الوضوح والقوة الخاصة بالمهام، الحدود المؤسسية، الواجبات، الادورا، المسؤليات، المصالح والمشاركة لكل اصحاب المصالح والعلاقة. يجب تجنب امكانية سيطرة النخب، كما لوحظ من لجان الاحواض او جمعيات استخدام المياة الحالية. توجد طرق

مثبتة لتجنب سيطرة النخب خلال جلسات الخيارات الجماعية والعمل المستقل للجنة (ابتداء بالبروتوكولات في صنع القرار الى التشهير بمن يقوموا بسلوك غير مرغوب فيه)، ولكن كافة الحلول يجب ان تكون قابله للقياس.

13. بالنسبة للتصميم المؤسسي ننصح بتحديد وتطوير ادوات مناسبة ل:

أ. المراقبة والتقييم،
ب. العقوبات التدريجية،
ج. ترتيبات خيارات جماعية مع مشاركة واسعة عمودية وافقية لأصحاب المصالح (اشراك كبار السن الذين يتمتعون باحترام ممن يعرفون التقاليد)،
د. التوزيع العادل والمتساوي للكلف،
ه. الفوائد والمخاطر و
و. منع الصراع واليات الحل

14. ولكل هذه العناصر المؤسسية، يجب على كافة الاطراف (مجتمع المانحين، والحكومة اليمنية، والمجتمع المدني، الخ) ان يكونوا مدركين انه من الحاسم ان يطوروا ترتيبات خاصة بالسياق. على هذه الترتيبات البيئية ان تأخذ بعين الاعتبار البيئة التى تعمل بها السلطات المحلية وجمعيات استخدام المياه، وتركز على التعاون الفعال بينها وبناء القدرات المطلوبة وتدريب الموظفين، والانتاج والتبادل المشترك للإعلام، وكيفية التعامل مع الفساد، وكيفية خلق بنية تحفيز ايجابي، يحفز المساءلة والاستجابة.

15. عندما يشترك مجموعة من اصحاب المصالح في موارد مشتركة، كما هو الحال في انظمة المياه الجوفية او احواض الانهار الكبرى العابرة للحدود، نحتاج ايضا الى مبدا تصميم اضافي من اجل وضع الاساس لنظام حوكمة اكثر حيوية: تميل الاطراف المحلية لمعالجة القضايا المحلية فقط، بينما الاطراف الوطنية تميل لمعالجات الاولويات الوطنية فقط. في حالة الموارد المشتركة العابرة للحدود، يجب ان تكون الاصوات المحلية والوطنية ممثلة في صنع القرار. ولذلك، تبرز الحاجة لحوكمة جماعية متعددة المستويات. بما ان الحكومة الجماعية لا تنشا بشكل تلقائي، يجب ان تبنى على هياكل حوكمة تقليدية، بدلا من نظم دولة (جديدة وخارجية)، مع تيسير وتعزيز نشط وفاعل.

16. بالإضافة الى ذلك، يمكن تطوير منهج حوض نهر وتطبيقه خطوة خطوة. في الخطوة الاولى، يمكن استخدام منهج حوض النهر لجمع البيانات حول حقوق المياه، الاستخدام الحالي والتدخلات التي قد تؤثر على توفر وتوزيع المياة (مثلا، فحص السدود، الابار العميقة). حماية هذه الارقام الخاصة بالتغيرات الطبيعية والاجتماعية والاقتصادية لا تساعد فقط في تحديد مصادر الصراع ولكن ايضا في ايجاد حلول لهذه الصراعات.

دعم سيادة القانون

اذا نجحت المناهج التقليدية في استعادة شرعيتها والحفاظ عليها ، فانها ستقدم مدخلا لتقوية سيادة القانون على المدي الطويل. الان، في بعض المناطق، النظام التقليدي قد سد جزئيا الفراغ المؤسسي الذي حدث منذ عام 2011 وقدم حلول مناسبة. ان نظام الحكم التقليدي هو نظام مرن وقابل للتكيف، وفق مقتضيات الظروف: استجابة لمتطلبات الوضع، فان قواعد وممارسات جديدة قد برزت. في هذا البحث وفي بعض المناسبات، فان نتيجة الصراع تبدوا انها تتسبب في تأسيس قوانين جديدة لحكم الممارسات (التباعد الجيد، الارضية المشتركة، موارد المياه المشتركة، الخ). ننصح لذلك في دعم القانون الرسمي والتقليدي، من خلال دمج نقاط القوة فيهما.

17. المساعدة في تطوير صندوق فقراء المجتمع اليمني لدعمهم وتمكينهم من الوصول الى المحاكم. ومن البديهي وضع الضمانات الضرورية لمنع السيطرة.

18. تطوير محاكم مياه متنقلة للصراعات المائية. تم التوصية سابقا بإنشاء محاكم متنقلة والانتباه الى امكانية حدوث فساد فيها. بالإضافة الى احكام المحاكم، قد تقدم المحاكم المتنقلة هذه تثقيف حول القوانين المطبقة وتقدم المشورة الفنية فيما يتعلق بقضايا المياه (وبالتالي تيسير حل الصراع خارج المحاكم). بهذه الطريقة، يمكن تجسير الفجوة بين القانون الرسمي والقانون التقليدي (ويمكن تحسين شرعية احكام المحاكم) ويصبح الوصول للعدالة ممكنا، حتى لأكثر الجماعات فقرا. للمحاكم المتنقلة ميزة اخرى شبيهة بالعلاقات السياسية والاقتصادية ذات " الطبيعة الرأسمالية المبنية على المحسوبية" (التي تقدم فرص للحكم، والاثراء الذاتي والهيبة) لديها اثر اقل على موضوعية وشرعية احكام المحاكم.

19 . دعم تقييم مستقل لدور المانحين على إدارة المياه وامكانية حدوث الصراع.

20. يجب تطوير استراتيجية تبرز الاستجابات العملية الاولى للصراعات المائية. يجب صياغة الاستراتيجية بمشاركة الشيوخ، موظفي نورا، مكاتب المحافظين، مدراء الاقاليم، ضباط الادعاء العام، والقضاة المحليين وجماعات المستخدمين. كجزء من الاستراتيجية، يجب تطوير نظام تواصل واضح بين الهيئات الحكومية المعنية المختلفة.

21. يجب تفعيل القوانين الموجودة على مدى فترة زمنية اطول، خاصة قانون المياه لعام 2002 والانظمة لعام 2011، التي تحتوي بنود اقوى لتنظيم كافة الامور المتعلقة باستخدام المياه، وتوزيعها واولويات الوصول لها. التفعيل يتطلب دروس مستسقاة من نقصها الحالي للتأثير.

22. هناك حاجة لتقوية قدرة فاعلين من اطراف ثالثة في حل الصراعات. على سبيل المثال، من خلال تقديم التدريب في المبادئ القانونية الرسمية والتقليدية لتوزيع المياه وحل الصراع. الفاعلين المحتملين هم نورا وجمعيات استخدام المياه والفاعلين الحكوميين المحليين. حاليا، غالبا ما يعمل الافراد في هذه المؤسسات على اساس شخصي.

23. تحفيز دمج مناهج الوساطة في النظام القانوني الحالي كمنهج معترف به.

24. هناك حاجة ايضا لوضع قوانين افضل لحقوق وقوانين المياه، التي تدعم التمييز بين المياه السطحية والجريان شبه السطحي والمياه الجوفية (بدون فقدان الروابط الضرورية):

أ. على سبيل المثال، هناك حاجة لتعليمات واضحة للمسافة التي يمكن نقل المياه خارج مصدرها، وكميات الميه المسموح بضخها لأغراض الري.
ب. مثال اخر هو قوانين توزيع المياه السطحية (الوافرة) التي تمت صياغتها لعدة انهار سريعة الزوال، ولكن فى كثير من الحالات قديمة ولا تناسب وجود الهياكل الدائمة او اثرها على اعادة التغذية وبالتالي توفر مياه الشرب.

Foreword

As project leader it is my pleasure to acknowledge the following persons for their valuable contributions to this project.

Firstly, I would like to express my gratitude to His Excellency Ambassador Jeroen Verheul, Zumreta Jahic (Royal Netherlands Embassy in Sana'a) and Job Kleijn (Dutch Ministry of Foreign Affairs), for making this project financially possible and their continuing support in developing this highly relevant topic.

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The report was written by Patrick Huntjens (The Hague Insitute for Global Justice), Rens de Man (The Hague Insitute for Global Justice), Ting Zhang (The Hague Insitute for Global Justice), Frank van Steenbergen (Meta-Meta), Cecilia Borgia (Meta-Meta), Jaap Evers (UNESCO-IHE), Marleen van Rijswick (Utrecht University), Daphina Misiedjan (Utrecht University), and Alberto Tjen A Kwoei (Utrecht University).

Furthermore, I would like to thank the speakers and participants from Yemen (see Annex 6), during the stakeholder consultation meeting on 4-6 June 2014 in Amman, for sharing their personal stories, insights and experiences with water related conflicts. Their extremely valuable contributions, helped shape this report and the recommendations. Fabienne Smith of The Hague Institute provided continued support in making sure that the stakeholder consultation meeting in Amman was logistically perfectly organised.

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Patrick Huntjens,

Project leader
Head of Water Diplomacy | The Conflict Prevention Program
The Hague Institute for Global Justice
July 2014
The Hague

Glossary

Please note that the Arabic names are written phonetically, which often results in spellings that might seem totally different.

Adal (plural: Odool)	Guarantees from both sides. In tribal customary law the purpose of the Adal is to show commitment from both conflicting sides to abide by the verdict of the arbitrators. The Adal could consist of machine guns, cars and a million Yemeni Rials from each side. Also the arbitrators with their armed guards will settle as guests alternating between the two conflict parties. In tribal traditions, conflict parties have to pay hospitality to the arbitrators. It is a way to appreciate their help, but also to push the parties to settle the conflict quickly to reduce expenses they spend on arbitrators. "The real war is the war of feasts- Alharb harb Almawa'ed" is a local saying indicating how costly it can become to host arbitrators.
Al Ala Fala'ala, or Al'ala Bel Al'ala	It stipulates that land upstream has the priority of water use, than areas which are situated lower, all the way to the lowest level of the stream. Despite its geographical dimension, new users upstream do not automatically gain priority in water use, as prior appropriation is also to be respected.
Al Awal fa AlAwal	Whoever settled first has the first right to irrigate from the flood despite the location of his land.
Al Hiwar	Dialogue as a medium of conflict resolution is the basis of the "al-Hiwar"-programme established by the Yemeni government. The target of this programme is to reeducate Islamists and convince them to reject violence. It is led by the judge Mahmud al-Hitar and receives great international attention. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen).
Al-Ana or Al-shamla	Communal "voluntary" work, such as well-digging, building bridges or dams, and rebuilding after calamities.
Al-Jabart/ Gabarty	Ajabarti is an Islamic scholar who lived in wadi Zabed in the 16th century and wrote the manuscript of the flood distribution rights for the lands on the sides of the wadi Zabed. Al Ala Fala'ala rule is based on his law.
Al-Mosha'aa	This refers to land that is respected by locals as public space for everyone's use including grazing and water usage.
Al-Muthaha	Mutual support among neighbouring farmers - irrigation equipment, labor etc.
Al-Ta'awon fi Majal Al-ray	Co-operation in irrigation - one farmer is responsible for distributing water collected during rainfall.
Ala'awal be Al'Awal	The traditional rule stipulates that water goes to Ala'awal be Al'Awal (First then First). This means that well owners should irrigate for those who are closer to them before moving to the next closest, and so on.
Alaqrab bel Aqrab	The closer then the close: which means that those close to the water source have the priority. The traditional rule also says that priority should be given to drinking water then irrigation.
Aqil	The Aqil is the head of a tribal branch and responsible for arbitration of

	conflicts in everyday life. If he is not competent enough to solve the case, the persons involved in the conflict can address a Sheik of another tribal branch or tribe.
Fanyaat	In the old times, farms would distribute water through Fanyaat (plural of Fanyah). A fanyah is a small canal. Every Fanyah has a manager (Wakeel/agent). The Fanyah agent is responsible for distributing water on the canal he is managing. The Fanyah agent would collect contributions from farmers that he will use to maintain the canal and transfer water to their farms. Farmers were not allowed to use water unless they obtain permission from him to do that. Al'ala bel A'ala was the rule. The agent had the power and authority to compel farmers to open the water flow to those further downstream so that they are able to obtain sufficient water. Also, part of the rule was that farmers would prevent the flow of water from their land to other lands so that it does not affect those other lands.
Fard	Fard refers to the verbal statements of the arbitrators regarding their assessment and judgment of the situation before it becomes a written verdict.
Gheil/ ghayl	Ghayl is the continuous natural stream flow, perennial base flow. This is used to describe spring water. Ghail water is allocated through timeshares to farmers; at the start they divide it for 19 days, called "dyala", when the 19 days ends, they repeat it again from the first. Often there are 6 "deyalat" in four months. When they divide the water of the Gheil they divide it in a regular way, e.g., you take your share in the first "diala" which may be (1/5) of the water. In the second "dyala" we mean here the second new 19 days your share be (1/8) of the water and the share of the others must be the same share.
Hadith	What the Profet Mohammad has said. This is an important source of law. The prophet Mohammad hadith (says) "people are shareholders in three things water, pasture, and fire". This means that people should have access to these three basic things whenever they need it.
Jihad	To fight for Jihad is an important Islamic principle and is considered as a basic duty for every Muslim. The interpretation and use of Jihad is subject to political and social conditions. The term Jihad includes the strive towards a life that corresponds with moral Islamic principles or the physical fight against non-Muslims in case of attacks against Muslim territory. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen)
La Dhur Wla Dhirar	No harm regards both sides, meaning that the proposed solution of the problem must not have any harmful effect on both sides.
Libnah	Unit of area.
Madhab	The Constitution since unification made no specific reference to which school of thought (madhhab) the Code of Personal Status would follow. It only made references to Shari'ah in general terms and avoided any mention of the Zaydi, Shafi'i or Isma'ili sects. This was part of North and South Yemen's attempts to stress the nationalist, non-sectarian nature of the Yemeni state (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen)

Mahjourine	A ward used by a person when he wishes to stop another person or group from invading his rights or ownership.
Manadeb	Manadeb system (pluaral of mandab). A mandab is a hand dug canal that regulates water distribution among farmers in a wadi/valley. A mandab allows for water to flow from the Wadi into distribution canals that go to farmers lands
Maragha	Complicated cases of conflicts between different tribes demand an expert, who is called a 'Maragha' and is specialized in complex tribal conflicts. He is firm with the specific coherences and the history of a tribal conflict. He is the highest judicial authority. Although it is desirable and possible, that every tribe has its own Maragha, it is not brought out by every tribe. If the tribe doesn't have their own Maragha, the Maragha of another tribe can be asked for advice and support.
Marawah	Local council solving local disputes
Markoom/ Maraqeem	A newly (customary) written norm amongst tribes. This might refer to water distribution and use rules, but also to the free passage of Huthies in tribal areas. The Huthies are in conflict with the central government, but the government needs to respect the Markoom and cannot arrest Huthies in tribal areas governed by the Markoom.
Mashaekh	Traditional leader/ old, wise man
Maslaha	Maslaha means common welfare. The impact of this concept for conflict management and conflict solving is the flexibility of the jurisdiction in accordance with actual facts. Individual rights are indeed subordinate to common welfare, which contradicts often the western, individual driven sense of justice. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen).
Mazare motadah	Usual farms: well-owner irrigates the lands of the people who are "part of him". This means that there is a traditional informal agreement that certain well-owners irrigate for certain people. And that landowners are not supposed to turn to another well-owner even if he offers them lower price.
Mead/ Moa'ad/ Ma'ad	Unit of area, mainly used in Tehama. One moa'ad equals 66m x 66m = 4366m^2. Or 1 hectare: 2,29 Mead.
Mubah	According to the Muslim cultural tradition, water is considered to be a free natural resource, an open access resource or ***"Mubah",*** which means: permissible, also allowable, free available for all. However, the religious teachings have also repeatedly emphasized to make judicious use of it. In semi-arid zones, where water resources are, in any case limited, it is, however, very hard to convince people, that a natural good perceived as God's "gift" should be restricted. (http://www.yemenwater.org/wp-content/uploads/2013/03/Negenman-T.-2000.pdf).
Naeb	Governmental organisation where important religious judges pronounce their verdict.
Profit division rule	Within the Khadeer district, in Taizz, the traditional rule is that for Qat irrigation the profit is divided as follows: ¼ for the water provider, ¼ for the land owner, and ½ for the one who plants the seeds and watches the land.

	For Corn, 1/3 of the crop for the water provider. This rule does not apply if water owners sell water for money. There are no restrictions on drinking water use. It is for everyone even those who come from outside the area.
Qada	Unit of quantity.
Quran and Sunna	Quran and Sunna (exemplary speech and deeds of Prophet Muhammad) are the main sources of the Islamic law, Shari'ah. The Quran is not a compilation of laws, but instead it contains recommendations or admonitions. However, in the case of conflict, e.g., in the criminal law clear instructions can be found. Quranic verses have to be interpreted in order to be used in everyday life. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen)
Sayl	The sporadic and brief surface flood flows resulting from rainfall. Also called *Faidhey*. Compare with Ghayl.
Sayyid, Zaidis	The Zaidis are a Shiite group with the viewpoint that a person only can become an Imam if he is a Sayyid (descendant of the prophet) and has certain characteristics like courage, talent, a sense of fairness, justice and piety. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen)
Seaf/ Karef	The floods arrive in two seasons Seaf (summer) during March to May, and Karef (autumn) August to October.
Shari'ah	Shari'ah is a concept that regulates the whole life of a believing Muslim. In many Arab countries, Shari'ah is the basis of state jurisdiction. Chapter 1, Article 3 of the Yemeni Constitution for example, states that "Islamic Shari'ah is the source of all legislation." The primary sources of Shari'ah are the Quran and Sunna. In the first centuries of the Islamic era, two more categories for implementing justice were added: (1) Igma', i.e., the consensus of Islamic scholars on a legal case, which is cannot be amended by the Quran or by Sunna and (2) Qiyas, analogy conclusion, which made it possible to adjudicate upon new cases by comparing them with already existing ones. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen)
Sheikh	The 'Sheikh' is responsible for difficult and serious cases. His judgment is legally effective for the whole tribe. The Sheikh has to be male, of considerable age, and authorized for his function with the required knowledge and wisdom.
Shura	Shura is the concept of reciprocal counseling with the objective to decide upon a controversial issue. Progressive scholars consider Shura as inherent in Islam. They refer to distinct Quranic verses and the practice of the prophet Muhammad. The statements of the prophet Muhammad (hadith) give account of the prophet's habit to council with his companions in cases of conflict and decision-making. The reciprocal counseling is also mentioned in the Quran, known as Shura. In a political sense, reformists use the Shura concept as an argument for political participation of the population. (Source: Andjelkovic-Al Amry, 2005. Traditional Conflict Management in Yemen).
Suruub al miiyaah	Water distributor
Tanseeb	Tanseeb for the graves of the two that were killed. In tribal culture in these

	areas, those who were killed in the conflicts are buried but, unlike other dead, with no stone around there graves. This implies that the tribe still has to take revenge for those who are killed. Once the revenge killing is resolved, like the case in this conflict, tribesmen put stones around the graves to indicate that no more revenge is needed.
Urf/ Orf	The sources of customary law (urf) are mainly of pre-Islamic origin and include agreements and codes of conduct for the overall organization of tribal life in compliance with tribal customs.

Currency (21 July 2014):

€100 euro = YER 29.073 Yemeni Rial

YER 100 Yemeni Rial = €0,34 euro

Chapter 1. Introduction

The goal of the project is to develop policy relevant recommendations for the prevention and the resolution of water-related conflict by assessing the political economy of water management in Yemen. Water management is a complex and inherently political process with assumed game-changing potential. It may prevent an acute water crisis from escalating into a large-scale violent conflict, or it may exacerbate the situation further. Naturally, the underlying assumptions need to be unravelled further.

Customary law has for many years regulated access to surface water in Yemen. Groundwater is considered a "fugitive resource that has increasingly been exploited under an open access regime" (Nibbering 1997: 40). Nowadays, water management regulations in Yemen generally lack enforcement and equity is a huge problem (Mewes, 2011). Access to groundwater is, in principle, open to all, but *de facto* this is hardly the case.[1] A recent estimate suggests, "90 per cent of the water resources are used for irrigation and that 45 per cent of the urban population has no access to centralized water supply systems and about 65 per cent of that population is without centralized sanitation systems" (Yemeni-German Technical Cooperation 2012).

In addition to technical data on surface water and groundwater use,[2] one also needs to qcquire more knowledge regarding the different stakeholders and their vested interests. In Yemen, groundwater is a common pool resource with high risk of unequal access, unequal distribution and insufficient control mechanisms. This may exacerbate covered conflicts on water into escalating violent conflicts.

Conflict, however, does not necessarily need to turn into violence. Up until the 1960s, Yemen possessed a "remarkably effective" (Moore 2011) water management system that relied on an "advanced knowledge of water-flow patterns and organizational means to control them" (Harrower 2009). This primarily applied to surface water and was effectively regulated by means of customary and Islamic legal provisions (Moore 2011). Traditionally, farmers often agreed upon and implemented sets of water rights and rules that *inter alia* stipulated which field would have to be irrigated first and from which flood category.

The opening of the country for the import of modern drilling and groundwater withdrawal technology in the 1970s coupled with a significant increase in population growth,[3] encouraged the use of groundwater resources for agricultural, industrial purposes and domestic use. The Yemini government's water policies in the period after the 1970s constituted an important element in the patronage politics that secured Saleh's power position for the following 30 years. The groundwater development enabled farmers to raise incomes, whilst the subsidy policies allowed the government to "consolidate its alliances with many important interest groups" (Ward 2000).

Groundwater abstraction contributed to a shift in the local configuration of power in Yemen offering even greater power to sheikhs and influential elites, which led to the marginalization of smallholders in rural areas and the urban poor. Some individuals have made considerable short-term profits from groundwater while others have fallen behind. Moreover, national groundwater abstraction initiatives – unlike traditional forms of

[1] http://www.yemenwater.org/wp-content/uploads/2013/03/Negenman-T.-2000.pdf

[2] In the case of groundwater, this implies inter alia the balance between groundwater abstraction and recharge, the number of users per aquifer, and the rules and regulations determining the access to groundwater.

[3] Population growth rate is estimated by UNICEF at 2.7% per year (UNICEF Country Statistics Yemen 2012). The Global Gender Report 2013 estimates the population growth rate at 3,06% (World Economic Forum 2013)

water management – took "little notice of complex and localized relationships between natural resources and those who depend on them" (Moore 2011), which caused traditional technologies and institutions to unravel (*Ibid*).

Hence, since the 1990s, a number of internationally promoted initiatives took root, such as the privatization of water supply units in cities, a national Water Law, and the support of local initiatives to achieve more decentralized and efficient forms of water management. These initiatives have led to small improvements in practice (Taher *et al.,* 2012; van Steenbergen et al., 2011), but a more systematic analysis of the conditions for effective, decentralized groundwater management in Yemen is very much needed. The current economic incentive structure in Yemen (including subsidization of diesel) seems to encourage - instead of discourage - groundwater extraction (Hellegers et al., 2011). Al-Shaybani also warns that some "forms of decentralization has multiplied rather than solved problems" (Al-Shaybani 2005).

Interestingly, one can observe two seemingly contradictory trends in present-day Yemeni surface and groundwater regimes. On the one hand, there are ample reports that growing awareness of new water regulations and increasing involvement of water user associations in local water management has led to new informal rule-making that often protects the local community as a whole rather than only the elite (van Steenbergen et al., 2011). Yet there are increasing signs that local water conflicts are steadily becoming more violent over the last decade (SAS 2010; van Steenbergen et al., 2011). In view of these developments, it is necessary to further investigate these trends and the nexus between existing conflict resolution mechanisms and the escalation of new conflicts.

It is assumed that a better understanding of the political economy of current Yemeni groundwater management is a precondition for generating tailor-made policy advice for more effective conflict resolution. This could radically improve water security even under constrained conditions as found in Yemen and thus serve as an important tool for conflict prevention.

This research will reflect on Harold Lasswell's famous question "who gets what, when and how" by reflecting on several themes, such as:

- Who is who in Yemen's water management? This includes an analysis of who has which strategic interest (including external donors), as well as who are the actors who have a vested interest in water crisis perpetuation; are there specific vulnerable groups who suffer more then others form water scarcity and conflicts?
- What knowledge do the local population and the authorities have on the consequences of water usage?
- What regulatory and *de facto* authority do the local regulatory bodies, but also national ministries and and other parties (e.g., sheiks) hold?
- What formal and informal rules actually determine access to and use of water supplies?
- What is the best role for the state and the tribes respectively in local water management?

Chapter 2. Concept note

Key message:

This chapter presents an analytical framework for the exploration of the inherently political processes of water management. It serves as a structural guidance for the field research and subsequent analysis. We identify several key components, based upon a number of existing frameworks and proven concepts, to analyse the political economy and the conflict dimensions of water management in Yemen.

The resulting analytical framework has been used to answer the key questions of our research: 1) What is the interest of stakeholders involved in the emergence of water-related conflicts? 2) Which conflict solutions (formal and traditional) are used for preventing or resolving conflicts in land and water management? and 3) Are these solutions part of existing practices being used or of new arrangements being established?

Understanding the political-economy of water management, and explaining the key characteristics and drivers of water conflicts and/or cooperation over shared resources, requires a different analytical approach than that used within other conventional frameworks for conflict analysis, e.g., developed by the UN, USIP, USAid. The necessity of developing a different tailormade framework for water conflict analysis is explained by the fact that water management and governance is characterized by complexity and uncertainty, as water use is influenced through dynamics from the natural, societal and political domain.

Water issues are complex because of their intricate coupling with multiple issues within the natural and societal domains. Additionally, water management must take into account issues related to uncertainty, nonlinearity and feedback. Uncertainties related to conflict and cooperation over water resources are of a diverse nature. It may entail unpredictability of developments (e.g., climatic, demographic, economic, or political), incomplete knowledge, ambiguity or conflicting views on the seriousness of a problem, its causes and potential solutions. Nowadays, uncertainties related to water resource management are on the rise since the pace and dimensions of changes (e.g., climatic, demographic) are accelerating and are likely to do so even more in the future.

Key questions within this research:

1) *What is the interest of stakeholders involved in the emergence of water-related conflicts?*
2) *Which conflict solutions (formal and traditional) are used for preventing or resolving conflicts in land and water management? and*
3) *Are these solutions part of existing practices being used or of new arrangements being established?*

To answer the above questions, we have used the following key references for developing our conceptual and analytical framework:

- 'A political-economy framework for groundwater governance', developed by the World Bank (2012)[4]
- 'Ten Building Blocks for Sustainable Water Governance: An Integrated Method to Assess the Governance of Water' developed by an interdisciplinary team of academics, chaired by Van Rijswick (2014)[5]
- 'A framework for analysing institutional and political contexts of water resources management projects', developed by IRS (2012)[6]
- 'Toolkit and Guidance for Preventing and Managing Land and Natural Resources Conflict', developed by EU-UN partnership (2012)[7]
- 'Managing uncertainties in networks', a framework for stakeholder analysis developed by Koppenjan and Klijn (2006)

The remainder of this chapter will provide a brief overview of the key references as listed above.

[4] Wijnen, M., Augeard, B., Hiller, B., Ward, C. and P. Huntjens (2012) MANAGING THE INVISIBLE: Understanding and Improving Groundwater Governance. Draft Report Water Paper, June 2012, published by the Water Unit, Transport, Water and ICT Department, Sustainable Development Vice Presidency. World Bank, Water Partnership Program, 2012

[5] The text of the assessment method and paper is edited for the Yemen study but is partly based on 'Van Rijswick et al,. 2014. Ten building blocks for sustainable water governance: an integrated method to assess the governance of water, Water International, 2014, DOI: 10.1080/02508060.2014.951828, To link to this article: http://dx.doi.org/10.1080/02508060.2014.951828.' This article describes an integrated method to assess the governance of water and has been developed by an interdisciplinary team of academics, chaired by Van Rijswick.

[6] Beveridge, R., Monsees, J., Moss, T. (2012) The IRS Handbook – Analysing institutional and political contexts of water resources management projects. July 2012.

[7] EU-UN Partnership (2012) Toolkit and Guidance for Preventing and Managing Land and Natural Resources Conflict

2.1 A political-economy framework for groundwater governance (World Bank, 2012)

The framework used for this analysis distinguishes three parts of the groundwater governance system: the policy level, the strategic level and the local governance level. Nations establish their groundwater objectives at the policy level. Strategic level governance is the stage at which a nation puts in place institutions and instruments to align stakeholder behavior and actual outcomes with policy objectives. Finally, local governance level involves the organizations and institutions that control actual outcomes on the ground, and respond in varying degrees to rules and incentives. The framework is putlined in figure 2.1

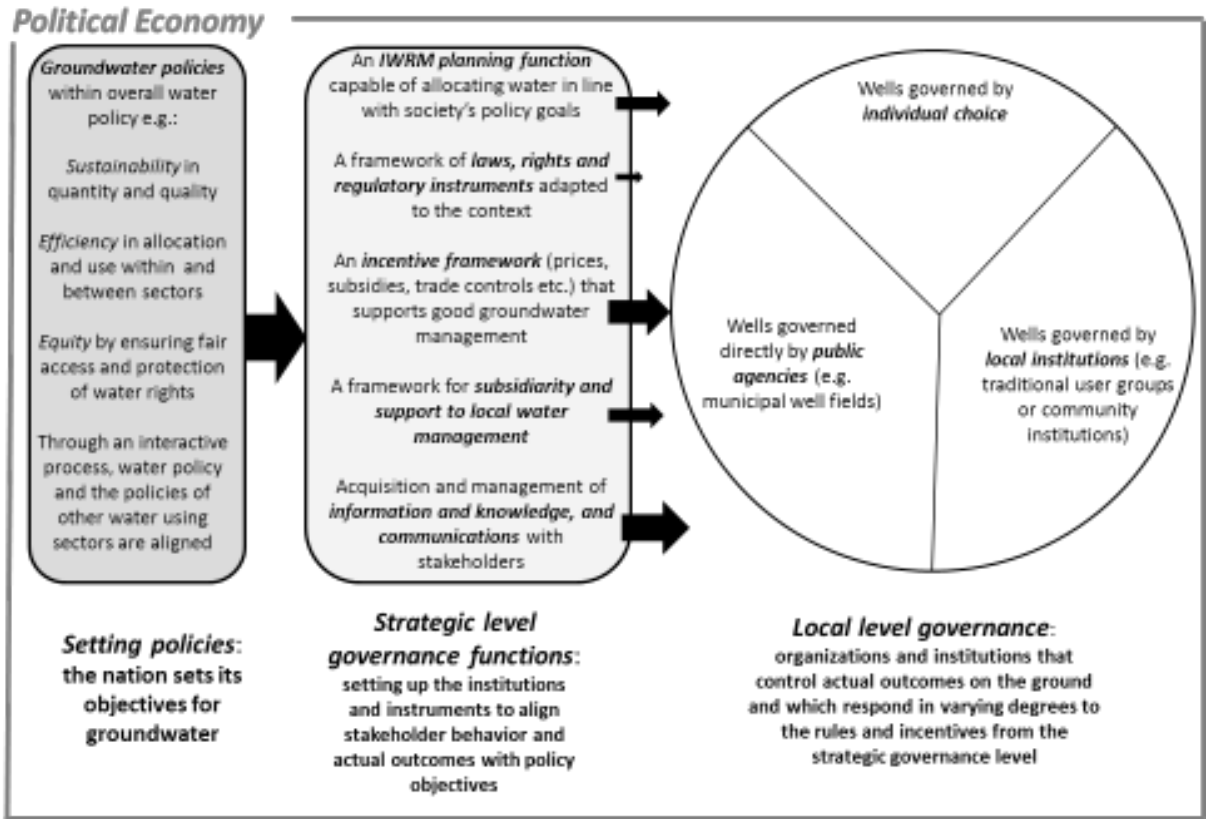


Figure 2.1: A Framework for Analyzing and Assessing Groundwater Governance

The remainder of this section on the World Bank Report summarizes essential dimensions that need to be addressed to analyze water governance capacities and related challenges. The following sections develop upon a framework (see figure 1) based on a hybrid of different structures developed by Huntjens (2011), Huntjens et al., (2010, 2011a, 2012), Pahl-Wostl and Lebel (2010) and the OECD report on Water Governance in OECD countries (2011). For the purposes of the analysis in this ESW report, a distinction is drawn between context, water governance capacities and performance, as presented in figure 2.2.

The socio-economic, political and cultural contexts for water governance vary greatly from place to place, as well as from country to country, e.g., with respect to histories of settlement, ethnicities, class and gender relations. Hence, the context in which a water governance system is embedded has a strong influence on the system and its performance. As a result, institutional reforms may lead to quite different outcomes as a

consequence of the context. To move away from simplistic panaceas context variables need to be taken into account (Ostrom et al., 2007; Harrison, 2006; Pahl-Wostl, 2009; Pahl-Wostl and Lebel, 2010).

For analysing water governance capacities, the framework in figure 2.2 includes five key elements:

- Institutional arrangements
- Information collection and management
- Participation, communication and education
- Policy and legal systems
- Financing/funding

The abovementioned elements are not mutually exclusive, and crosscutting issues and interdependencies may exist. For example, sectoral fragmentation of water-related tasks across ministries and agencies is considered a policy gap, legal gap and institutional gap, albeit from a different perspective and with different indicators.

Important to note is that the analytical framework is being used as a heuristic device in this report, in order to identify and highlight predominant governance issues based on the case-study reports. This means that not each and every variable of the framework will be covered and/or described in full detail in chapters 4, 5 and 6, but only those apsects that stand out according to our empirical analyses.

Many authors have put evaluating the performance of different modes of governance forward as a key focal area for future research (Jordan, 2009; Biermann et al*.,* 2009; Pahl-Wostl, 2009; Huntjens, 2011). Measures for the performance of a water governance system should allow assessing and evaluating the degree of satisfaction with the current state of water governance. Obviously a governance system should achieve its stated goals. Failure to do so is a clear sign of a non-satisfactory performance without alluding to any normative claims (Pahl-Wostl and Lebel, 2010). In this ESW report performance has not been taken into account in the case-study reports, but it is strongly recommended as a follow-up activity.

Judging performance of a water governance system (or the effectiveness thereof) is challenging for several reasons. Firstly, other social and political processes that surround the management and governance of water resources often confound identification and attribution of specific outcomes. Secondly, the outcome of management measures is uncertain due to the complexity of the system to be managed and uncertainties in environmental and socio-economic developments influencing the performance of implemented management strategies. It is, therefore, important to monitor the water governance systems for a longer period and on a frequent basis. Thirdly, the relevance and meaning of indicators for success or failure may be judged differently by different groups, and thus lead to different assessments of the performance of water governance systems (Pahl-Wostl et al*.,* (2007). Nevertheless, some approaches are likely to be useful without alluding to any normative claims. One approach is to assess the achievement of stated goals, for example the Millennium Development Goals (related to water resources) or IWRM goals, including economic efficiency, social equity and ecosystem sustainability. Also process criteria are useful for assessing performance, such as access to resources like information, clear task definition, structured decision-making and cost-effectiveness. In governance systems where there is an effort to elicit consideration of alternatives other criteria related to being visionary and deliberative should also be considered (Dore, 2007).

In governance systems confronted with disturbances, crises and/or external changes, such as the impacts of climate change and related uncertainties, it is important to assess the level of policy learning (Huntjens et al*.,* 2011). A formal comparative analysis of eight water governance systems in Europe, Africa and Asia has shown that systems with a higher level of policy learning also have more advanced adaptation strategies in place for dealing with the impacts of climate change on water resources (Huntjens et al., 2011).

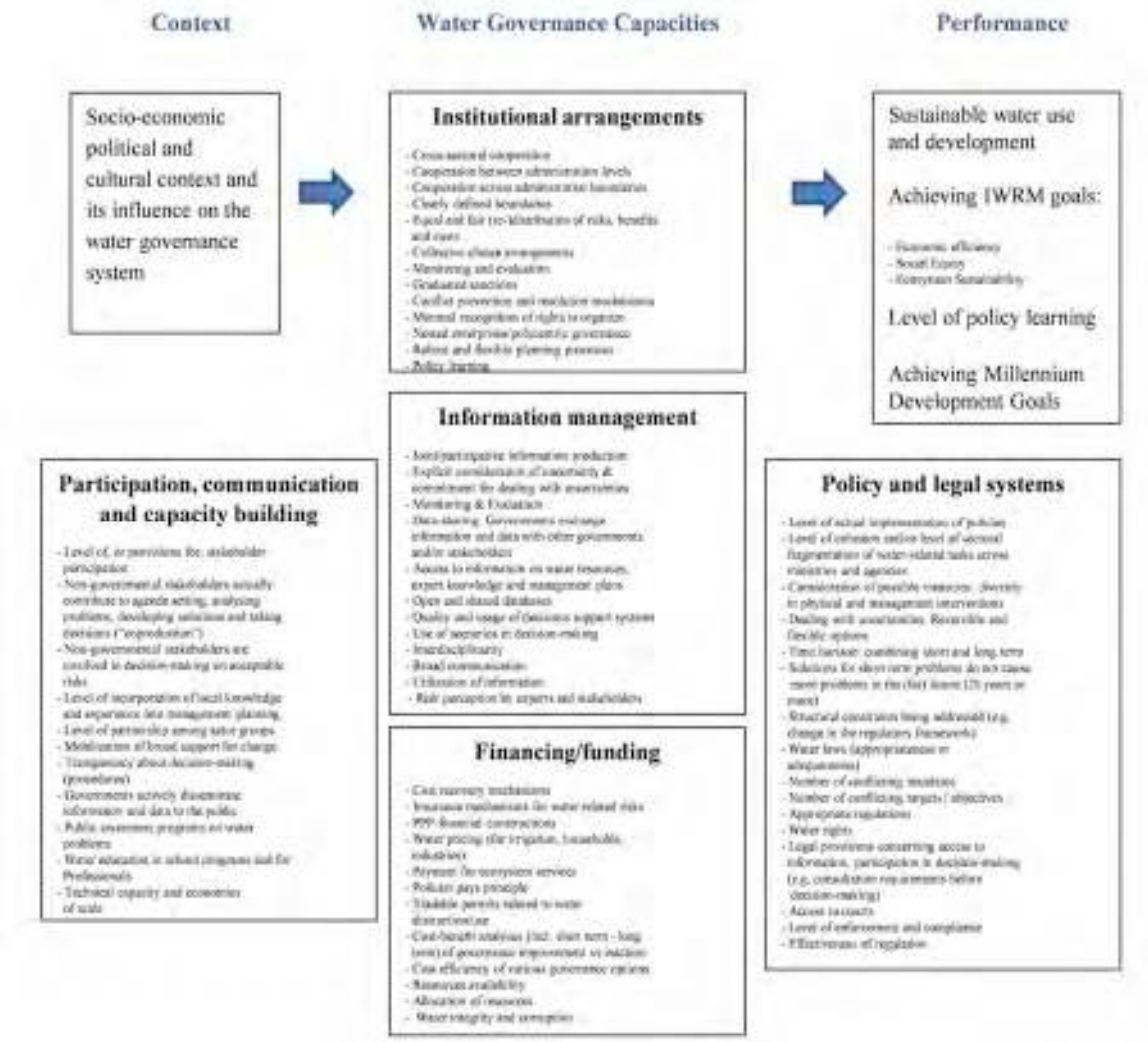


Figure 2.2: World Bank ESW Analytical Framework for Water Governance, developed by P. Huntjens (2012)

2.2 An Integrated Method to Assess the Governance of Water (Van Rijswick et al., 2014)[8]

This method provides a methodology to assess the collaborative and integrative approaches to deal with water management (water shortage, water quality and flood risks). This assessment method is based on shared values and concepts of various disciplines respectively water system analysis, economics, law and public administration. This method consists of three main parts: (1) content, (2) organization, and (3) implementation.

First, content knowledge about the water system in time and space and about values, principles and policy discourses is required. This knowledge is a prerequisite for the organizational process to come to an agreed service level. Secondly, the organizational process requires sufficient stakeholder involvement, insight into the trade-off between social objectives, attribution of responsibilities, authorization and the associated means as well as regulations and agreements. Finally, the agreed service level has to be implemented, which requires adequate engineering of infrastructure, enforcement and conflict resolution.

Integrated assessment method

The strength of water management and governance in a certain state, region or river basin can be judged on the basis of the assessment method shown in Figure 2.3. It has been developed to assess the main gaps in the (1) knowledge base, (2) weaknesses in the organization process, and (3) problems that may arise when implementing the agreed service level. The method consists of ten building blocks and is of a diagnostic nature.

Sound water management requires knowledge about the water system in time and space, as well as values, principles and policy discourses. This knowledge is required for the organizational process to reach an agreed service level. The organizational process requires sufficient stakeholder involvement, insight into the trade-off between social objectives, attribution of responsibilities, authorization and the associated means as well as regulations and agreements. Finally the agreed service level has to be implemented, which requires engineering of infrastructure, enforcement and mechanism for conflict prevention and conflict resolution.

For the Yemen case, it is important to note that the methodological analsyis used to analyse the causes of potential and ongoing conflicts, as well as to recommend potential improvements by assessing all ten building blocks.

[8] The text of the assessment method and paper is edited for the Yemen study but is partly based on 'Van Rijswick et al,. 2014. Ten building blocks for sustainable water governance: an integrated method to assess the governance of water', Water International, 2014, DOI: 10.1080/02508060.2014.951828, To link to this article: http://dx.doi.org/10.1080/02508060.2014.951828.

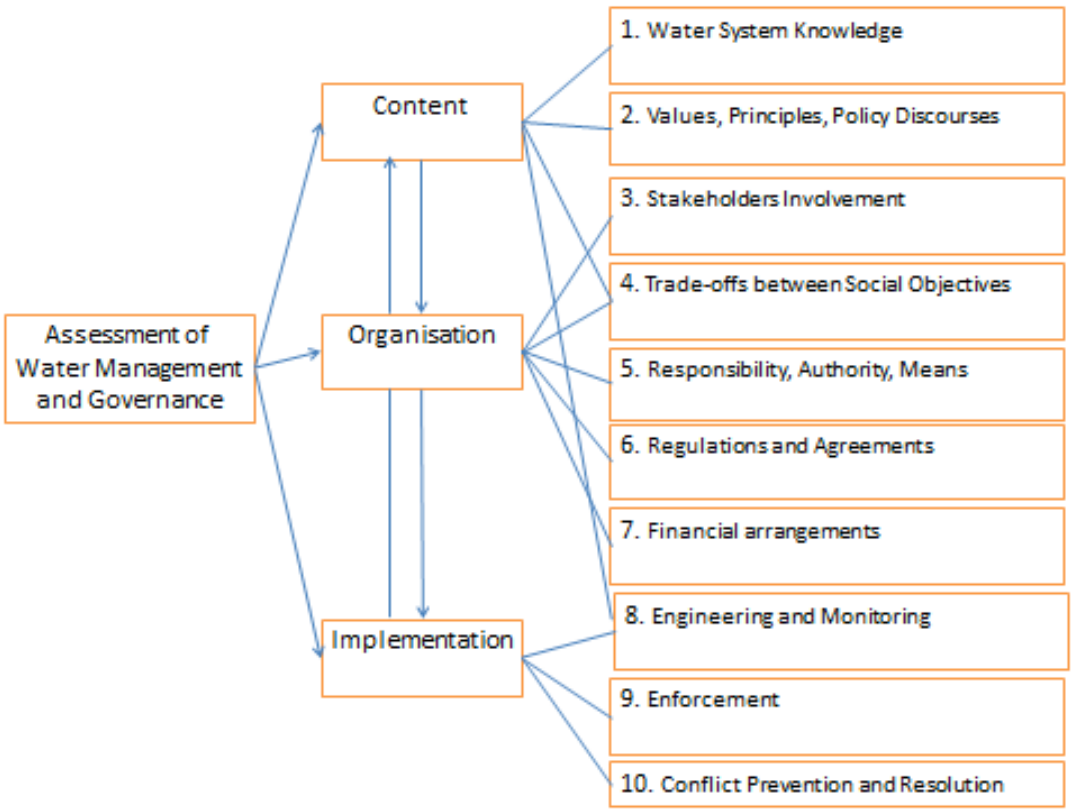


Figure 2.3: The multiple dimensions of water management and governance

The presumption is that water governance is sound when all three main dimensions and corresponding ten building blocks are dealt with. The sequence and interdependence among these dimensions and elements have important implications. Sound water management and governance will only eventuate when there is congruence between these dimensions and corresponding elements. For example, implementation without attribution of responsibilities is doomed to fail, and enforcement only can take place if regulations and mutual agreements are in place. Conflicts can be prevented or solved by taking into account all other building blocks. This illustrates the integral and interdisciplinary aspect of the assessment method. Finally, the figure illustrates the cyclic aspect of the method. Once the agreed service levels have been implemented, the loop might go back at the content as it can have consequences for the state of the water system, or when monitoring shows the need for revision of one the building blocks.

Criteria have been developed to assess the governance of water through the building blocks. In the next paragraph the criteria that have been used to judge the strength of each building block are defined.

2.3 A framework for analysing institutional and political contexts of water resources management projects (IRS, 2012)

According to the framework developed by IRS (2012), water conflicts analysis should contain four stages in an iterative process. The depth of the analysis depends upon the purpose of the research, but should start with an analysis of stories people tell, in order to reconstruct their perception regarding the problems and possible solutions. From these stories the location of the problem can be defined and the actors that have a leading role in these problems can be identified. In the following step, an inventory is made of possible institutional solutions. In the final phase, the practical steps of transforming the problem into the desired situation are defined and analysed. The following section outlines the general analytical framework of the IRS framework (see Fig. 2.4).

Stage 1: Water Storylines describes a means of researching problems and solutions in water resources management from stakeholders' perspectives. This inductive approach fixes the researchers' gaze directly on what actors think and do in relation to water resources management. It is about identifying what is at stake in water resources management in the project area and who the stakeholders are. More specifically, it examines their narratives concerning the problems in the area, the ways they construct causal chains between issues, events, other actors and their general surroundings. It focuses on the ways in which problems and solutions are defined. In doing so, it also details the range of ways of thinking about water resources management, strategies for achieving objectives, as well as any contests or points of consensus concerning problems and proposals for their resolution. Importantly, this also entails an assessment of the storylines of project funders and the project managers regarding problems/solutions, as well as their ways of thinking about water resources management. In other words, the project itself, its objectives and personnel, are also part of the analysis.

Stage 2: Domains of Water Problems/Solutions builds on the storyline research by mapping problems/solutions in terms of the political, cultural, spatial, hydrological and temporal domains within which they are embedded. Whether they are focused on extraction rules (institutional) or upstream-downstream uses of a river (spatial, institutional), problems have different dimensions and actors different stakes in them. This stage is concerned with characterising the form problems take, as well as the places, or "domains of interaction" (Mollinga, 2008), in which they are found. In part, research aims to spatially locate problems within the implementation context. More fundamentally, it details the nature of the problem, the issues to be addressed and changed, contests and power relations, as well as the courses of action deemed relevant to solving the problem. This is, then, about alerting projects to the factors most crucial to a consideration of problems and solutions.

Stage 3: Political and Institutional Feasibility shifts the focus firmly onto the assessment of solutions and their potential 'fit'/'misfit' with existing institutional arrangements and processes. The institutional arrangements and processes of the domains relevant to solutions are assessed in terms of their key characteristics, such as their problem-solving approach, as well as their formal and informal rules of interaction. The aim here is to expose the arrangements and processes upon which change is dependent and gauge the degree to which they might be amenable to such change, i.e., the extent to which there is a 'fit' with the proposed solutions, what implementation problems might be expected ('misfits') and where further information is needed to clarify the degree of 'fit'.

Stage 4: Ways Forward is concerned with identifying the most appropriate means of implementing solutions and promoting favourable institutional and policy settings. The aim is twofold. Firstly, an assessment is made of how solutions with a high degree of 'fit' with existing institutional relations might best be taken forward. This might be in terms of the allocation of resources, the formation of partnerships with organisations or the introduction of particular technologies, etc. Secondly, suggestions are made as to how those solutions with a low degree of 'fit' could be advanced by means of adaptation or reform to institutional arrangements at one or more of the relevant domains. The objective here is to explore opportunities for generating more favourable institutional contexts for a particularly desirable solution so that it is not sidelined as being unrealistic under current circumstances.

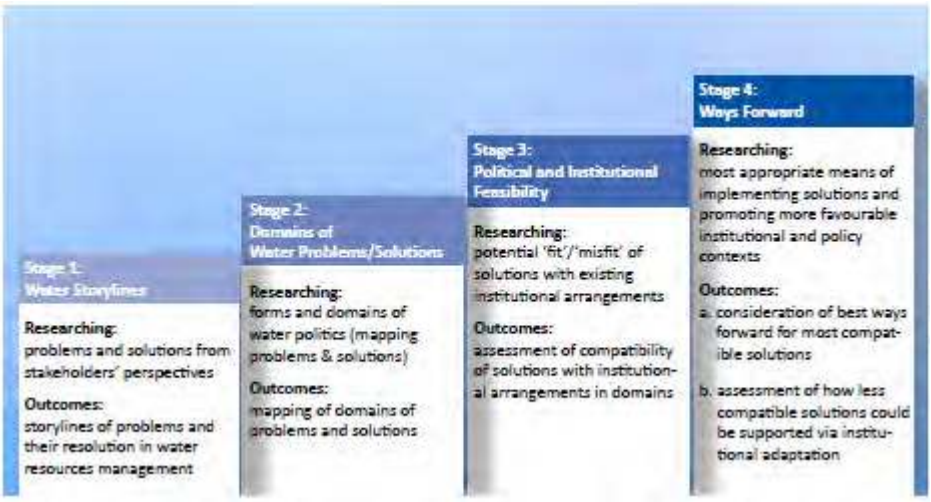


Figure 2.4: The key steps and outcomes in the IRS analytical framework

Key questions that can be addressed in each stage, are the following:

Stage 1: Water storylines

Problems and solutions form stakeholder's perspectives

- What stories do actors tell about problems and their (possible) resolution in water management?
- How are problems defined? What are the perceived causes of problems and what kind of changes and (financial, technological, human) resources are mentioned as necessary to making improvements?
- Which actors are affected by problems, who is held responsible for them and who is regarded as able to resolve them (i.e., who are the stakeholders)?
- Which problems/solutions are most frequently mentioned?
- What coalitions of actors are presented or, less directly, are discernible in storylines?
- Where are the points of consensus or conflict within and between different storylines?

Stage 2: Domains of water problems/ solutions

Forms and domains of water politics

- In which political/spatial/scalar/temporal domain(s) are problems and solutions located?
- What stakes do actors have in these problems/solutions?
- Who has power according to these storylines?
- Who is portrayed as being responsible for problems? Who is seen as affected by them? And who appears to have the power to resolve them?

Stage 3: Political and institutional feasibility

Potential fit and misfit of solutions with existing institutional arrangements

- In terms of Moss' components, how is the management of water resources institutionally configured?
- Which political and institutional arrangements and processes are most relevant to implementing solutions?
- What kind of institutional configuration might the proposed solutions require?
- How compatible are the requirements of the proposed solution with the existing arrangements and processes? What level of fit/misfit exists between the proposed solutions and existing institutional arrangements?
- Overall, how feasible do solutions appear to be?

Stage 4: Ways forward

Most appropriate means of implementing solutions and promoting more favorable institutional and policy contexts

In terms of solutions with a high degree of fit:

- What specific measures and resources are required to implement solutions?
- Who should be included/consulted in implementation?
- How long would it take? And how should costs and benefits be equitably distributed?

In terms of solutions with a low degree of fit:

- What will be the benefits of institutional and policy reform and how will these benefits be distributed?
- What will be the costs and who will bear them?
- Who will be the bearers of institutional transformation? Who will constitute the coalition of interest groups to push forward and implement the change?
- Around which storylines/issues can such efforts be organized most productively?
- How can these coalitions be supported?
- What can realistically be done to adapt the enabling and
- Constraining conditions for this institutional transformation?
- How can knowledge producers and processors such as project researchers and managers, consultants and reflective practitioners play a more active role in this process?

2.4 Toolkit and Guidance for Preventing and Managing Land and Natural Resources Conflict (EU-UN partnership, 2012)

To improve capacity for land and natural resource management (NRM) and conflict prevention, the EU partnered with the UN Framework Team in late 2008. The aim of this partnership was to develop and implement a strategic multi-agency project focused on building the capacity of national stakeholders, the UN system, and the EU to prevent land and natural resources from contributing to violent conflict. Six UN agencies, programmes or departments have been involved, including UNDESA, UNDP, UNEP, UN-HABITAT, DPA and PBSO. The partnership is also designed to enhance policy development and programme coordination between key actors at the level of country offices.

The first outcome of this project is an inventory of existing tools and capacity within the UN system and a set of four Guidance Notes on addressing NRM and conflict prevention. These Guidance Notes cover: (i) Land and Conflict (ii) Extractive Industries and Conflict (iii) Renewable Resources and Conflict, and (iv) Strengthening Capacity for Conflict-Sensitive Natural Resource Management.

The report provides a useful overview of conflict over renewable natural resources that drive, reinforce or compound other stress factors (see below).

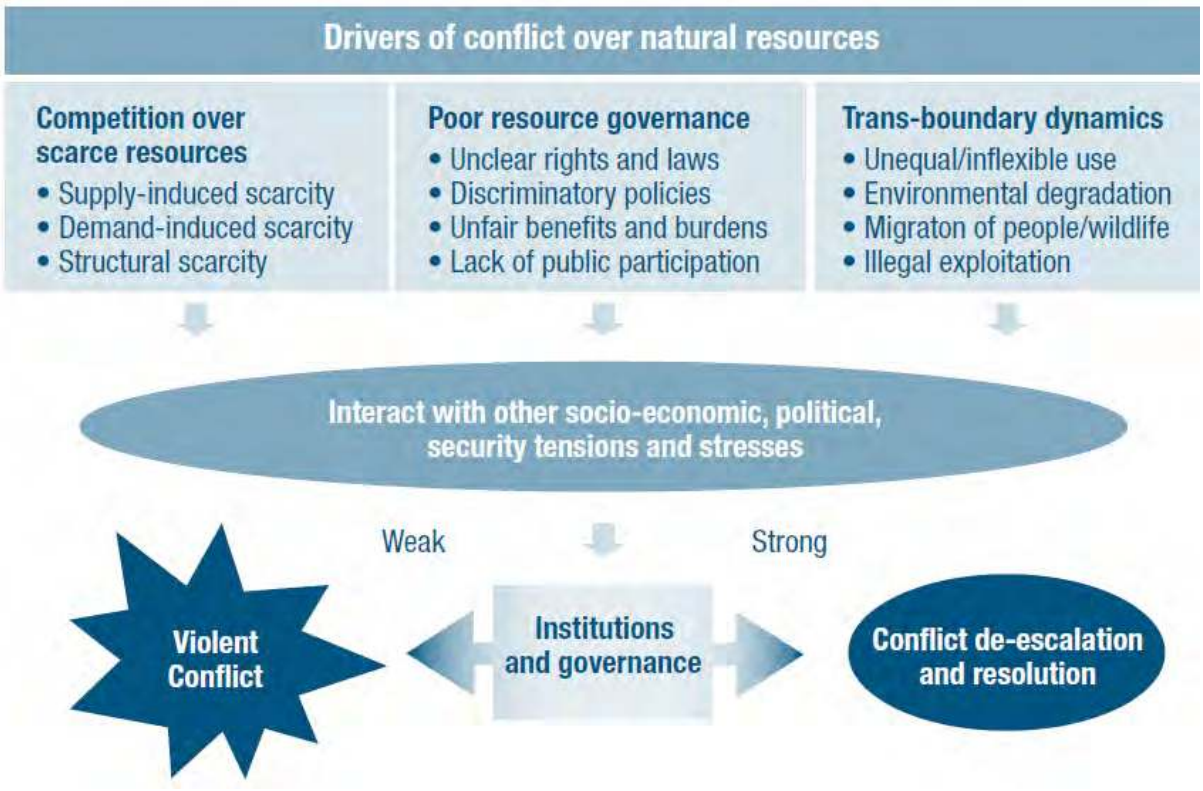


Figure 2.5: The EU-UN toolkit

2.5 Actor analysis framework (Koppenjan and Klijn, 2004)

In summary, Koppenjan and Klijn (2004)[9] proposed to take the following steps, which are elaborated in greater detail below through a number of guiding questions:

Step 1:Problem situation
Step 2: Inventory of actors
Step 3: Problem perceptions
Step 4a: Position of actors: a dependency analysis
Step 4b: Actions
Step 5: Relevant arenas
Step 6: Identify and analyse stagnation
Step 7: Inventory of interaction patterns of actors
Step 8: Inventory of patterns in actors' perceptions
Step 9: inventory of institutional provisions connecting parties

Step 1 problem situation

- What does the current situation look like?
- What undesirable consequences result from it?
- What are considered the causes for this situation?
- What is the desired situation?
- What objectives and criteria serve as the foundation for this?
- What solutions and policy alternatives are pursued?

Step 2 inventory of actors

- Which actors are actively involved in the problem?
- Which actors possess hindrance or realization power, in the sense that they have authority or other resources that play a role in the emergence or solution of the problem situation?
- Which actors have the knowledge, insights, and ideas that can contribute to the enrichment of the problem formulation, i.e. that can be considered for the solutions?
- Which actors have an interest in finding a solution to the problem situation? Which actors can be expected to be involved at any particular moment?
- Which actors are not likely to participate, but are affected in some way by the problem or the approach to it?

Step 3 problem perceptions

- What standards do actors use to access the situation?
- What is their perception of the existing and/ or expected situation? What is the crux of the problem? To what degree and in what sense are there gaps in the actors' perception? How do they determine these?
- In their view, what are the most important causes of the problem situation?
- What influencing techniques/means do they distinguish with regard to the problem situation and its causes?

[9] The actor analysis framework of Koppenjan and Klijn (2004) is presented as part of their book publication on 'Managing uncertainties in networks: A network approach to problem solving and decision making'

- What images do actors hold about aspects such as problem, causes, solution, other actors and developments in the environment
- To what degree do these perceptions differ? / What obstacles could be caused by differences in perception?

Step 4a position of actors: a dependency analysis

- What means do different actors have at their disposal? (i.e., types of resources and the significance of these resources to other actors: financial, production, competencies, knowledge, legitimacy resources)
- How important are these means and can they be acquired elsewhere?
- Is there unilateral or mutual dependency?
- Are actors critical, dedicated and/ or comparable?

Step 4b actions

- What actions have they undertaken?
- What impact have these actions had?
- What does the actor want to achieve with regard to the problem situation?
- Why do these actors pursue these objectives with regard to the problem situation?
- What costs and benefits for the actor are related to the problem situation or the suggested directions of solutions?
- Strategies: Go-alone/ conflictual/ avoidance/ cooperative/ facilitating strategies

Step 5 relevant arenas

- Where are the decisions made that are important to the initiative/ policy game that is analyzed?
- Who are the most important actors in the policy game and what subsets can be recognized?
- Which actors interact in which context?
- What decisions are made at which locations?
- What are the backgrounds of the actors?
- What organizational arrangements exist to structure the interaction of these actors?
- How coherent are these groups of actors?

Step 6 identify and analyse stagnation

- Is there stagnation in the game?
- What is the nature and structure of the stagnation?
- Which actors are involved in the stagnation?
- Are these blockages or stagnation?
- To what extent is the stagnation cognitive c.q. social by nature?

Step 7 inventory of interaction patterns of actors

- Which actors interact frequently and which infrequently?
- Which actors have a varying contact pattern and which do not?
- Which actors are central and peripheral in the network given their contact pattern?

Step 8 inventory of patterns in actors' perceptions

- What perceptions do actors hold with regard to problems, solutions and their environment?
- To what degree do these perceptions correspond to those of other actors?

Step 9 inventory of institutional provisions connecting parties

- What formal rules and juridical procedures apply?
- What informal rules can be distinguished?

- What meeting and consultation procedures or other organizational constructions exist in the network that structure the policy game?

2.6 The Yemen water conflict analysis framework

Key message:

- **An appropriate analysis of conflicts and suggestions for conflict resolutions should be based on an integrated analysis of the conflicts, not only looking at water-related issues, but also at the historical, political, institutional, legal and societal context. Context and contextual changes; how are the conflicts embedded in the local physical, socio-economic, political and legal-institutional structure, which lessens, intensifies, shapes and distributes the conflict? Have contextual changes triggered or caused conflict?**
- **Stakeholder analysis: Identify the practices, interests and influences of the involved actors: who gets what, when and how?**
- **Dispute regulation mechanisms: Which solutions for preventing or resolving conflicts are tried and why?**

Based on the abovementioned frameworks, we envisage that water-related conflicts are embedded in a wider physical, socio-economic, political and legal-institutional structure, which lessens, intensifies, shapes and distributes the conflict. Conflict arbitration and mediation occurs via both formal structures, as well as traditional and spiritual leaders. However, the effectiveness of dispute regulation mechanisms rests not only on information availability and transparency, but also on the trust stakeholders have in these mechanisms and the balance of power impacting the acceptance of mediation efforts.
Therefore, we derive the following parameters, which are elaborated below. In chapters 4 (*Context*), 5 (*Stakeholder analysis*) and 6 (*Legal and regulatory framework*), these parameters are analysed in greater detail for the specific context of Yemen. We use these parameters to develop and operationalize an analytical framework for the design, implementation and analysis of the research in Yemen on water conflicts.

2.6.1 A: Context and contextual changes

How are the conflicts embedded in the local physical, socio-economic, political and legal-institutional structure, which lessens, intensifies, shapes and distributes the conflict? Moreover, have contextual changes triggered or caused conflict?

It is important to embed water conflicts in a wider context, since they are not isolated from other developments, but occur in the context of climatic, demographic, cultural and economic change, as well as transformations in information technologies, global governance, social conventions and the globalizing flows of capital and (to a lesser extent) labour (see O'Brien and Leichenko, 2000).
Within the context of climate change, the management of water resources is afflicted with uncertainties; unpredictability of development, incomplete knowledge or conflicting perspectives on the seriousness of a problem, its causes and potential solutions (Pahl-Wostl, 2007; Isendahl et al., 2010). Nowadays uncertainties increase since pace and dimension of changes (e.g., climatic, demographic) are accelerating and are likely to increase even more in the future.
The water system supports key societal functions, such as – in the Yemen case – mainly domestic and agricultural water use, including irrigation. Knowledge of this system refers to knowledge of the natural processes, but also knowledge of the properties of the infrastructure depends on its societal functions. These

functions often change in time, as we see with the quat production in Yemen leading to changes in the requirements of the water system. Authors refer to the importance to have adequate knowledge of the impact of these changes to be able to show and explain the impact of these changes to several actors involved. Furthermore, a river basin approach is required to analyse and manage upstream consumption and downstream availability to be able to identify sources for conflicts, but also to identify conflict solutions. Insight is also required into the impact of investments in water resources development on water availability. In many places, just as in Yemen, water is currently over-allocated and heavily polluted, i.e., more entitlements have been issued than existed in the past.

2.6.2 B: Conflict description and stakeholder analysis

Identify the practices, interests and influences of the involved actors: who gets what, when and how?

Social structure is both the medium and outcome of action (Giddens, 1984). According to Anthony Giddens (1984) and Alexander Wendt (1987) actors have preferences, which they cannot realize without collective action. Based on these preferences they shape and re-shape social structures, "albeit also through unintended consequences and over a longer period of time" (cf. Grin, 2010). Once these social structures are in place, they shape and re-shape the actors themselves and their preferences. This structure-agency dynamic is crucial for understanding complex water problems, in which various actors with different and often opposing values, viewpoints and interests discuss, deliberate and negotiate problems and solutions for water issues. Hence, a stakeholder analysis (also called stakeholder assessment or mapping) is of particular relevance given the complexity and political nature of the water management. It helps to determine the positions, levels of influence and power of different actors, their inter-relationships, and the channels through which influence occurs.

For the abovementioned reasons, an extensive stakeholder analysis is necessary for understanding the political economy of water conflicts in Yemen. The stakeholder analysis is the process of identifying and analysing stakeholders, and in many instances it is used to plan for stakeholder participation in water management (see Huntjens, 2011). There are a great number of methodologies concerning stakeholder analysis with a wide range of complexity (see e.g., Rietbergen-McCracken et al., 1998; NETSSAF, 2008, CAP-NET, 2005). For this study an assessment will be conducted regarding: who are the actors, what are their perceptions with regard to the problems at hand and possible solutions, what are their interests and how do the actors relate to each other, with a specifc focus on values and principles (see below)?

Values and principles[10]

Water issues touch upon different values, principles and narratives; this is also the case in Yemen. Values depend on historical, cultural, normative and political views. It is argued that good water management and governance are based on shared values because this enables legitimate solutions to be found that are easier to implement. Authors emphasize the importance of trust in the integrity of the partners involved and the aim to find solutions that are accepted by all. Also looking for common interests may play a positive role in finding shared values. Well-known general values are the recognition of human rights, equity, human dignity, justice, trust and solidarity or self-determination, whereas more water-related values may be the availability of

[10] The text of the assessment method and paper is edited for the Yemen study but is partly based on 'Van Rijswick et al., 2014. Ten Building Blocks for Sustainable Water Governance: An Integrated Method to Assess the Governance of Water. Water International, Water International, 2014, DOI: 10.1080/02508060.2014.951828.'

sufficient and clean (drinking) water, an equitable, sustainable and fair use of resources or the value that no significant harm should be done to others. Values are often - but not always - further elaborated in principles.

Principles differ from rules and regulations because of their more general character. The assessment method used distinguishes several groups of principles, namely (1) institutional principles, *inter alia* decentralisation, subsidiarity, river basin management, or integration; (2) principles of good governance, proportionality and public participation; (3) specific environmental principles, e.g., the precautionary principle, the polluter pays principle, the prevention principle, the principle that pollution should preferably be tackled at the source, and (4) technical principles, e.g., from global design to detailed design.

Conflicts may enlarge or decrease depending on the policy discourses in which they are framed. Framing is a three-fold process of selection, focusing and embedding (Dewulf et al., 2011). People frame issues by identifying certain aspects of a complex problem domain (a process of selection), by placing certain aspects in the foreground and others in the background (a process of focusing) and by using certain aspects as the overarching elements within which the rest fit (a process of embedding).

For the purposes of the Yemen study, values, principles and policy discourses are extremely relevant. Important here are traditional, religious and universal values as the concept of water as a public or common good, priority for basic needs, equality, sustainability and so on based on human rights, Shari'ah, customary law, the constitution, the Civil Code and the Water Law, but we see also principles as 'first come, first serve'. Religious and other power generating institutions seem to be of great importance, neglecting other values and principles and thus leading to conflicts. This can be derived from the legal analysis and the interviews and literature.

2.6.3 C: Dispute regulation mechanisms

Which solutions have been tried and why? What are the arrangements and practices used and newly established?

Preventing conflicts by sound mechanisms to create service level agreements with attention for trade-offs
In the Yemen context, the economics of water management is about the allocation of scarce resources, mainly focussing on water quantity, but also on water quality. Allocation is not only a legal or economic instrument but also a political bargaining process. The objectives that should guide allocation decisions should be clear just as the principles of equitable access, economic efficiency, sustainability and customary norms and values. Yemen, in a similar vein as many other countries, recognizes the need for reforming their water allocation. The implementation of new water allocation mechanisms will have various implications, which make the political economy of the reform of water policies complex and very vulnerable for conflicts. Service level agreements have to be translated into rules, regulations and procedures and will often use explicit or even implicit water allocation mechanisms (e.g., rationing, pricing, or markets or based on tradition ways of allocation like Dyala, Former of the First & Supreme to High, as we have seen in the Yemen study). The suitability of rules and allocation mechanisms to prevent or solve conflicts depend on the time and the geographical scales, but also on the values they are based upon.

Property rights
The identification of responsibilities and authorities with respect to water starts with the determination of property rights. Four traditional types of ownership are identified in literature: (1) private property, (2)

common property, (3) state or public property and (4) no property (*res nullius*). In the Yemen study, we see that several property regimes apply at the same moment, which may be a cause for conflicts.
Property rights are not absolute; they often include restrictions on the use of property by owners. These restrictions become more extensive in modernized and societies or modern water legislation. It has been argued that bottom-up organised common property arrangements have already existed for drainage and irrigation, oftentimes for centuries. The same is also true for Yemen.
To restrict property rights, the public domain requires centralized or decentralized powers to assign responsibilities and to organise policy processes. In the Yemen study, we have identified a mix of allocation mechanisms for authority and responsibilities, which may also be a cause for conflicts.

Financing water management
Empowerment with financial means is also part of a sustainable water governance system. Depending on shared values and principles the financing water management is based upon, conflicts may be more expected or more easily solved. We can think of cost recovery through a solidarity principle, which means that the costs of water policy are recovered from the national budget or budgets of decentralized authorities. We can also think of cost recovery through a profit principle, which means that those who have an interest in water services and the profits that arise therefrom, also pay for it.

Participative capacity
Participation is important to enable all water uses to have an equal opportunity to become expressed and recognized. Decentralization and strong local communities are seen as a favorable condition for participation.

Regulations and agreements
Regulations and agreements are the link between content and implementation and serve as a translation of service level agreements in rules, regulations, agreements and procedures. The appropriateness of rules and agreements depends strongly on the context of a certain case, as well as on cultural, historical, political, institutional and economic circumstances (developing/developed countries, rural/urban areas, religion, political/philosophical traditions), the legal traditions (common/civil law/traditional/indigenous law systems), the governmental organisation (centralized/decentralized/river basin management approach), the parties involved, the leading values and principles, the relevant and local water system characteristics, the actual water problem that has to be solved and last but not least, the intention of the parties. The main assessment criterion of regulations and agreements is legitimacy.

Engineering and Monitoring
The design and management of the existing infrastructure may not be suitable to fulfil the societal functions. For instance, the capacity of irrigation canals may be insufficient, as is the case in Yemen. The way existing infrastructure will be improved, may also lead to conflicts. To avoid conflicts in the future, improvements are preferably determined by the responsible authorities and agencies, after consultation of stakeholders, and based upon the trade-offs between (competing) societal objectives.

Enforcement
Water management and water governance assessments often focus mainly on the beginning of the policy process. There may be attention for public participation, formulating goals, rules and standards and the process of decision-making but hardly any attention for implementation and enforcement. A lack of enforcement will hamper the effectiveness of water management and governance and may in the end lead to conflicts and decreasing legitimacy, just as can be seen in the Yemen case.

Especially in cases that parties desire clarity as to their rights and duties, because they want to protect their interests and want to know who is accountable for achieving the goals set, enforceability will be an important issue. The same applies in cases where vulnerable values (water and ecosystems and the rights of vulnerable groups) are at stake. If vulnerable values are at stake, their role should be recognized, their interests should be sufficiently protected and enforcement mechanisms should be available. In the Yemen case, we see that parties rely on different rules (traditional and modern water rules) when they request enforcement. These - sometimes contradictionary - rules hamper enforcement, due to fragmentation and a lack of legitimacy, which in the end may lead to a 'pick and choose what suits you best' behavior. Important with regard to enforcement are the available remedies to achieve the objectives.

Conflict prevention

Conflict prevention asks for identifying potential economic, social and political benefits of cooperation. The concept of "Water valuation for water dispute resolution" shows the advantages of "benefit-sharing" rather than "water-sharing". This approach involves thinking about water in terms of its value, rather than just in terms of its quantities, quality and ownership. The parties can use this approach to negotiate the best water allocation and discuss benefit sharing. Offering compensation in case a reallocation of water is necessary, and may even diminish the risk of conflicts. Also in the Yemen study, it became clear that a lack of compensation measures, fragmented regulation and a lack of legitimacy are causes for the conflicts at stake.

Conflict resolution

If conflicts do occur, parties need an independent mediator, arbiter or judicial authority to solve the conflict and determine who is able to force parties to act in conformity with the final ruling. Conflicts can be solved in a proper way if stakeholders have formulated mutually accepted rules and procedures that prescribe how to handle or follow procedures in the case conflict of interests arise in water governance and management.

2.7 References

CAP-NET, ed. 2005. *Integrated Water Resources Management Plans. Training Manual and Operational Guide*. Pretoria: Cap-Net. URL [Accessed: 21.07.2010]. PDF.

Harrison, N.E., ed. 2006. *Complexity in World Politics: Concepts and Methods of a New Paradigm*. Albany: State University of New York Press.

Huntjens, P., Pahl-Wostl, C. & Grin, J. 2010. "Climate change adaptation in European river basins." *Regional Environmental Change*, 10(4): 263-284.

Huntjens, P. 2011. *Water Management and Water Governance in a Changing Climate – Experiences and insights on climate change adaptation from Europe, Africa, Asia and Australia*. Delft: Eburon Academic Publishers.

Huntjens, P., Pahl-Wostl, C., Flachner, Z., Neto, S., Koskova, R., Schlueter, M., NabideKiti, I. & Dickens, C.. 2011a. "Adaptive Water Management and Policy Learning in a Changing Climate. A formal comparative analysis of eight water management regimes in Europe, Asia, and Africa." *Environmental Policy and Governance*, 21(3): 145-163.

Huntjens, P., Lebel, L., Pahl-Wostl, C., Camkin, J., Schulze, R. & Kranz, N. 2012. "Institutional design propositions for the governance of adaptation to climate change in the water sector." *Global Environmental Change*, 22: 67–81.

NETSSAF (ed.) 2008. *NETSSAF Participatory Planning-Approach. A tutorial for sustainable sanitation planning. Network for the Development of Sustainable Approaches for Large Scale Implementation of Sanitation in Africa*. URL [Accessed: 29.03.2010]. PDF.

OECD. 2011. *Water Governance in OECD Countries: A Multi-level Approach*. OECD Studies on Water, OECD Publishing, Paris. DOI: http://dx.doi.org/10.1787/9789264119284-en

Ostrom, E., Janssen, M. & Anderies, M.A. 2007. "Going beyond panaceas." *Proceedings of the National Academy of Sciences,* 104(39):15176–15178.

Pahl-Wostl, C., J. Sendzimir, P. Jeffrey, J. Aerts, G. Berkamp, and K. Cross. 2007. "Managing change toward adaptive water management through social learning." *Ecology and Society* 12(2): 30.

Pahl-Wostl. C. 2009. "A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes." *Global Environmental Change*, 18: 354-365.

Pahl-Wostl, C. and Lebel, L. 2010, updated 2011. "Methods for Comparative Analysis." Twin2Go Deliverable No. 1.3.

Rietbergen-McCracken, J., Narayan, D.; World Bank (ed.) 1998. *Participation and Social Assessment: Tools and Techniques*. Washington: World Bank. URL [Accessed: 10.05.2010]. PDF

2.8 Recommended reading

Beveridge, R., Monsees, J., Moss, T. 2012 The IRS Handbook – Analysing institutional and political contexts of water resources management projects. Leibniz Institute for Regional Development and Structural Planning (IRS).

EU-UN Partnership. 2012. Toolkit and Guidance for Preventing and Managing Land and Natural Resources Conflict. UN-HABITAT.

Koppenjan, J., Klijn, E., 2004. Managing uncertainties in networks: A network approach to problem solving and decision-making. Routledge, New York.

Van Rijswick et al.. 2014 *Ten building blocks for sustainable water governance: An Integrated Method to Assess the Governance of Water*. Water International, 2014, DOI: 10.1080/02508060.2014.951828. To link to this article: http://dx.doi.org/10.1080/02508060.2014.951828

Wijnen, M., Augeard, B., Hiller, B., Ward, C. and P. Huntjens. 2012. *Managing the Invisible - Understanding and Improving Groundwater Governance*. Draft Report Water Paper, June 2012, Water Unit, Transport, Water and ICT Department, Sustainable Development Vice Presidency. World Bank, Water Partnership Program, 2012.

Chapter 3. Methodology

Key message:

Based on desktop research, in-depth fieldwork, stakeholder consultation and extensive expert reviewing, this research aims to thoroughly answer the following research questions:
1) What is the interest of stakeholders involved in the emergence of water-related conflicts?
2) Which conflict solutions (formal and traditional) are used for preventing or resolving conflicts in land and water management?
3) Are these solutions part of existing practices being used or of new arrangements being established?

The dynamics of water usage-related conflicts in Yemen are not very well understood. These conflicts are embedded in a particular socio-economic, political, legal and physical setting. The water usage impacts on aspects of food security, migration and the general security. Therefore, it is important to explore these dynamics more systematically. This will allow us to identify the specific factors, which can be addressed in order to prevent and mitigate water related conflicts.
The study includes:

- Desk-top research,
- Field research in three different hydro-geological areas on water usage-related conflicts and the underlying water management arrangements, and
- Stakeholder consultation.

The analytical framework is used to answer the key questions of this research:

1) *What is the interest of stakeholders involved in the emergence of water-related conflicts?*
2) *Which conflict solutions (formal and traditional) are used for preventing or resolving conflicts in land and water management? and*
3) *Are these solutions part of existing practices being used or of new arrangements being established?*

3.1 Operationalizing the conceptual framework: Indicators and questions

Based on the analytical framework developed in Chapter 2, we operationalize the identified key parameters (context and contextual changes, stakeholder dynamics, legal and regulatory framework) through the questions below. These questions are used during the desktop research and the local fieldwork, thus providing guidance in obtaining the relevant data.

3.1.1 A: Context and contextual changes

How are the conflicts embedded in the local physical, socio-economic, political and legal-institutional structure, which lessens, intensifies, shapes and distributes the conflict:

- What are the most important rules and mechanisms with regard to accessing/ allocating surface and groundwater for: drinking water purposes, agricultural use (cattle, crops, qat), industry and water for tankering (selling of water to cities)?
- Is the formal legal framework conducive to conflict prevention and solution?
- Do women or other vulnerable groups have different rights?

- Which actors play a role in defining the allocation mechanisms
- Which actors play a role in the allocation in practice (e.g. license for water use, day-to-day operation)
- Who is enforcing the water allocation mechanisms and how does this work?
- What have been the main changes in the last 10 years (physical, political, economic, legally, military)?
- Have the formal and informal rules changed (with regard to the allocation of water and resolution) as a consequence of these main changes?
- Are the traditional/ local rules still in place and did new local rules come up?

3.1.2 B: Conflict description and stakeholder analysis

What are the characteristics of the water conflicts in selected case studies in Yemen?

- How have people dealt with these changes in the way they have constructed their livelihood? Which groups gained and lost access to water in the last 10 years (2003-2013), and why? Did the problems result in conflicts with others? Or did the conflict erupt without relation to major changes? Describe the development of the conflicts.
- Describe the main cases where obvious degradation of the resource did *not* trigger a response. What prevented the potential conflict from escalating?

What are the interests of state and non-state actors in the conflicts?

- Who are the KEY actors?
- What are their main activities in last five years
- What means (authority, weaponry, power, money, knowledge) do they have available to carry out these activities?
- Why do they pursue what they are doing?
- What is their role in establishing water access?
- What is their role in conflict prevention/ resolution?

3.1.3 C: Dispute regulation mechanisms

What is the influence of policies and legal instruments in conflict prevention and solution? Which remedies are sought and why?

- With regard to the above mentioned conflict(s): Which remedies are sought and why?
- Which remedies are not tried and why?
- Were Islamic mediators involved? why/ why not?
- Were the traditional mediators involved? why/ why not?
- Were other parties involved in the dispute settlement?
- Was the case brought to court? why/ why not?
- Was the conflict solved?
- Are judgments effectuated in practice?
- What are solutions to the conflicts according to the interviewee? What would work?

3.2 Organization of the field research

The goal would be to obtain a sufficiently robust understanding of different water management regimes in three distinct settings in Yemen. This will inform us about the *de facto* role of different factors and actors in shaping the process of water management on the local, regional and national level. Furthermore, it will document the specific obstacles to policy changes, and will highlight ways to work effectively with these

obstables. Case studies are deemed a necessary tool for this assessment. The selection of the cases to be studied will be done on the basis of their hydro-geological, legal, economic and socio-geographic significance. The difference in hydro-geological conditions provides a first entry point for the case study selection. Yemen is heavily dependent on groundwater resources since the technology of diesel pumps became available. Conflicts around these resources arise in the vicinity of populated areas and irrigated agricultural lands with water intensive crops (predominantly qat production). As such four distinct case study areas arise:

1. Competition on groundwater in highlands
2. Conflicts on surface water in ephemeral rivers
3. Peri-urban competition
4. Special cases of high importance: e.g., the Marib dam

It is understood that:

- We are not necessarily looking at open conflicts, but also at conflictuous situations – including the phenomena of conflicts not rising to the surface but leading to a void situation that perpetuates (resource degradation).
- We are also interested in co-operation; in fact singularly emphasizing water conflicts has political connotations, in particular the right to intervene.
- We need to be cognizant of the fact that some water conflicts are hidden in land conflicts.

The next section describes the case studies options in greater detail as known to us during the start of the research. The options are to great extent derived from personal communication with Yemen experts.

3.2.1 Competition on groundwater in highlands

Key characteristics on competition on groundwater in highlands:

- Conflicts on uncontrolled use of groundwater for irrigation
- Affected area: 350,000 ha, highlands
- People involved: predominantly agricultural users

Table 3.1: Competition on groundwater in highlands

Selected case	Case represents	Issues
Sana'a Basin	Intense groundwater use for high value agriculture	• Controversy of surface storage (no added value for direct use or recharge) • Intense use of groundwater – declining groundwater tables • Examples of local rule setting • Several innovative recharge activities

Within this area several water-related conflicts have been identified based on their prior knowledge and the knowledge of local contacts. For Sana'a, these conflicts are Shahik dam, Arrowdah, and Bani Matar.

3.2.2 Conflicts on surface water in ephemeral rivers

Key characteristics on conflicts on surface water in ephemeral rivers:

- Conflicts regarding using surface (flood) water for spate irrigation. In such cases the conflicts concern highland storage, mid-stream diversions and blockage of subsurface flows

- Powerful landlords divert streams. There is not only insufficient surface water but there is also no recharge anymore. This has resulted in saline water intrusion in the coastal areas, a lack of drinking water, and desertification in some downstream areas.
- Affected area: coastal areas, plains in the south, i.e., Aden.
- People involved: upstream vs. downstream conflict, vulnerable coastal communities.
- Limited knowledge on the hydro-geological system and the available mechanisms to deal with water conflicts.

Table 3.2: Conflicts on surface water in ephemeral rivers

Selected case	Case represents	Issues
Wadi Siham	Use of spate water and groundwater for lowland agriculture	• Non-recorded surface water rights • Upstream control of flood water • Modern infrastructure disturbed subsurface flow and affected wells upstreams and downstreams • Intense use of groundwater for (export) horticulture • Drought and sanddune formation in coastal tail ends

Within this area several water-related conflicts have been identified based on their prior knowledge and the knowledge of local contacts. In Wadi Siham these conflicts are Hodedah/ Al Dabashiah canal project, and Bani Swaid.

3.2.3 Peri-urban competition

Key characteristics on peri-urban competition:

- Affected areas: smaller cities, e.g., Ta'izz, Aden
- It involves peri-urban competition between urban and rural areas (on waste water discharge, storage reservoirs and groundwater pumping (and possible requisitioning)
- There are projects on improving urban water services in view of the growing cities. Public drinking water companies need extra water, but at the same time there is no mechanism to "buy" from water sources.

Table 3.3: Peri-urban competition

Selected case	Case represents	Issues
Ta'izz	Urban-rural competition for water	• Highly unreliable urban water service • Conflict over urban water sourcing from rural areas • Claims and conflicts over reuse of waste water • Rural conflicts over use of springs • Implementation of water saving measures and watershed programs

Within this area several water-related conflicts have been identified based on their prior knowledge and the knowledge of local contacts. For Ta'izz, these conflicts are Al Hayma, Qurada and Marzuaah, Bani Yusof, and Al-Horor.

Thus the following areas have been selected: Sana'a Basin, Wadi Siham (Tihama), and Ta'izz Basin (city and surrounding areas). These case studies reflect different themes (see table), but are similar in geographical scale. Note that:

- The definition of basins in Yemen is open to debate as some of the basins cannot be clearly defined; for example, Sana'a Basin is a mountain plateau instead of a 'basin'.
- In the coastal plains of Tihama the boundaries of the plains are hard to distinguish. Consequently, conflictuous situations may spill over from one area to another.

3.2.4 Research partners

The desktop research is carried out by The Hague Institute for Global Justice, Utrecht University, UNESCO-IHE and Meta-Meta. Given the security situation in Yemen, we decided to carry out the field research via the Water and Environment Centre (WEC), affiliated to the Sana'a University. WEC is the direct local counterpart in this research, providing administrative and logistical support to three local consultants carrying out the fieldwork. Two of these consultants worked together, while a third expert triangulated the results and added her specific experience. As such, we are able to avoid bias and other errors.

The consultants have carried out individual interviews and focus group interviews with:

- Farmers, tank operators, etc.
- Local bureaucrates
- High level bureaucrats
- Legal experts
- Civil society representatives
- Judges
- Other relevant experts

In addition, during the fieldwork, a Dutch team of experts reviewed the fieldstudy results. During a stakeholder consultation meeting the results of the fieldwork and analysis are discussed with the stakeholders and the Dutch project team. The final draft report has been reviewed by Dutch and international experts.

Figure 3.1: Case study locations

Chapter 4. Context and contextual changes

Key message:

Yemen is a fragile State that is experiencing both violent and non-violent conflict. It has recently emerged after the 33-year rule by former President Ali Abdullah Saleh. President Saleh created a complex system of nepotism and patronage in which democratic institutions could not properly enforce checks and balances. These institutions were influenced by elites that possessed power over them due to their proximity to the regime. The system and its related challenges have persisted through the current transitional period. Water management in general has benefitted Yemeni elites to the detriment of society at large, while the lack of accountability has led to the unsustainable exploitation of water.

All of this has taken place against a background of widespread poverty and a lack of availability of water. Although there has been a steady improvement in some socio-economic indicators during the past two decades, the progress in other important indicators (in particular infant and child mortality, food security, and unemployment) has been inconsistent. Some of the latter have likely contributed to the 2011 revolution and all of the latter were disrupted by the 2011 revolution.

Socio-economic factors, compounded by physical conditions and changes, render Yemen vulnerable to the impacts of climate change and prone to conflicts between water users. Water-related challenges (both in quantity and quality) linger and threaten to undermine any socio-economic development made as well as to prevent future development. UNDESA (2011) mentioned two reports from 2003 and 2010 by the Yemeni Ministry of Planning and International Cooperation, which concluded that Yemen was off-track with respect to meeting the Millennium Development Goals.

The largest water user, the agricultural sector, with qat being an important crop in terms of monetary values and water consumption, uses a high proportion of the limited rain-, ground-, and (spate) flood water available and is highly inefficient. The Yemeni government is facing major obstacles in providing safe and secure water to larger segments of society.

4.1 Political dimension

4.1.1 General background on Yemen

The present day Republic of Yemen was formed in 1990 with the unification of the Yemen Arab Republic (YAR) and the People's Democratic Republic of Yemen (PDRY). The two former states had sharply contrasting political systems, with policy-making in the YAR being dominated by a relatively progressive military elite who worked closely with civilian technocrats, tribal leaders, and other traditional notables, while decision-making in the PDRY was determined solely by the Yemen Socialist Party (Al-Zwaini 2012).

Ranked number 152 out of 162 countries in the Global Peace Index in 2013, Yemen is considered to have a very low state of peace. Moreover, its level of peace has declined significantly between 2008 and 2013 (Institute for Economics and Peace, 2013). Yemen faces a range of security threats. Examples of security threats include:

- Zaydi-Shia rebellion in the northeastern corner of the country,
- Resurgence of Al-Qaeda in the Arabian Peninsula (AQAP) and their escalated attacks, and
- A resurfacing of a secessionist movement in the south (UN, 2011). Consequences of the security threats include, among many others, casualties amongst different groups, land grab, internal displacement and inaccessibility of larger areas to development and humanitarian actors. These security threats have also diverted government and international community's attention and resources from critical development priorities (UN, 2011).

Yemen has also been labelled a 'fragile state' by the World Bank in 2012, which means it lacks the ability to develop mutually-constructive relations with society and has a weak capacity to perform basic governance functions (OECD, 2013). The fragility is related to Yemen's continuous struggle with a range of structural problems. These include *inter alia* the use of force by non-state actors, legal pluralism, incidents of local unrest including calls for separation, food insecurity, intensified Al-Qaida militant activities (an example being AQAP's systematic targeting of Yemeni security personnel), and nepotism, patronage, and corruption (BTI, 2012).[11]

4.1.2 A short history of the patronage system

Ali Abdullah Saleh, Yemen's former president, ruled the YAR from 1978 before taking power in the United Republic. The political system was described as pluralized authoritarianism, which means that although some space is granted for alternative voices, there are severe restrictions on the establishment of alternative institutionalized power centers that might threaten the elites (Philips, 2007). While democratic institutions were accepted in principle, military and tribal figures such as sheikhs held veto rights, treated offices as personal fiefdoms that could be passed on to their offspring, and successfully avoided playing by the rules (BTI, 2012). Checks and balances were also absent.

Despite having a multi-party system and regularly holding elections between 1993 and 2003, power (and subsequently wealth) was concentrated in Saleh's hands and the groups around him. Rather than focusing on policy formulation, officials participating in elections were more concerned with building and reinforcing patronage links between themselves and society. Formal institutions, such as the parliament, tended to serve the interests of the regime, particularly Saleh's own interests (Philips, 2011). In the judicial sector, although institutionally differentiated, the judges were hesitant to challenge the executive due to Saleh's influence on the judiciary, which itself was weak, lacked resources and was infested by corruption (BTI, 2012).

Philips (2011) uses concentric circles to describe the regime in Yemen prior to Saleh's negotiated power handover:

1. With Saleh in the *center*, the regime's power spread out to his family (through whom he dominates the state's security apparatus),
2. Then an *inner circle* of Sanhan sheikhs and military commanders (whose power derives from their control of the military, their economic wealth, and their access to Saleh),

[11] The Corruption Perceptions Index 2013 by Transparency International ranks Yemen in the 167th place out of 177 countries.

3. Followed by an *outer circle* of selected Hashid and Bakil tribal elite and religious elite (who are critical as a group, but not necessarily individually important to Saleh's decision-making),
4. And finally inconsistent collective influence from political dynasties, traditional merchants, technocrats, political party elite, and dissenting tribal and other groups at the *outer most ring*.

Informal negotiation processes were constantly taking place among the different layers of circles, as the coalition of elites used the state to maximize their own interest at the expense of the broader Yemeni society.

The patronage system was built on rents from oil exports and access to the newly liberalized economy: around ten key families and business groups with close ties to Saleh controlled more than 80 percent of imports, manufacturing, processing, banking, telecommunications and the transport of goods (Hill et al., 2013). Saleh's dominance over the political processes was also strengthened by this strong system of patronage (UN, 2011), as the provision of patronage to elites enhanced the regime's ability to contain violence and maintain its centralized rule.

Saleh maintained a delicate balance of power between his close family members and his inner circle. Thiel (2012) argued that the increasing concentration of power around Saleh's immediate family breached unwritten power-sharing agreements within the regime's inner circle and eventually led to veteran regime insiders defecting to the democracy movement in 2011.

At the moment, Yemen also lacks operational institutions to exercise restraints on these groups. Although Yemen has supported a multiparty political system since 1990 and elections have been held regularly, favouritism towards the ruling party means that elections have not resulted in the accountability of officials or the government at large, or have offered any real alternation of power (BTI, 2014). The checks and balances to be enforced by an informed civil society with political oversight are lacking, which increases the potential for abuse in the exploitation of natural resources, including water.

Furthermore, potential revenues from natural resources are diverted out of Yemen in the form of illicit financial flows, instead of being utilized by the government for investment in social and economic development. Corruption can be the source by which illicit funds are generated and laundered (Reed and Fontana, 2011).

Nepotism, patronage, and corruption are relevant to water conflicts in Yemen for three reasons:

1. A direct impact is that rent-seeking groups are formed, which do not always take measures in the interest of the society at large, but with personal gains in mind. Over time, the powerful coalitions of rent-seeking groups become greedier and demand an even larger influence over national economic policies to consolidate their advantage (Lane and Tornell, 1996).
2. Indirectly, family members and other affiliates are often appointed to positions despite a lack of qualifications. In terms of water management, nepotism, patronage and corruption may lead to a sub-optimal use of water and subsequently poor development outcomes in terms of economic growth or poverty reduction (Kolstad et al., 2008).
3. Finally, nepotism, patronage, and corruption will have likely resulted in a general distrust by civil society in the formal institutions relevant to the use of water as well as water-related disputes.

The political context of Yemen cannot be understood without mentioning the tribal structure. Tribes are major social forces in Yemen. Tribes are mainly realities of the northern and eastern parts of Yemen, whilst the west and the south of the country consist of landlords and peasants (Al-Zwaini, 2012). Tribal customary laws strongly affect the implementation of legislation and contribute to the regulation of conflicts (Al-Dawsari, 2012 and Al-Zwaini, 2012). Traditional tribal leaders, sheikhs, are selected based on a combination of heredity,

merit, and the acceptance of that status within the tribe. They are in theory representatives of their communities to outsiders (Philips, 2011).

As mentioned in the concentric circles, the tribes' influence at the national level depends on their proximity to the regime. Many sheikhs are financially supported by the government through a non-transparent process according to their relevance to the regime (Philips, 2011). The regime uses incentives to strengthen the tribes, but at the same time also feared the tribes and was therefore motivated to weaken them through fragmenting their traditional power structures and dividing the power social forces into more manageable segments (Philips, 2011).

Philips (2007) views the current political system as superimposed on a society with strong tribal structures that are often quite autonomous from the state, with considerable regional differences, and with extreme poverty. Rather than superimposition, Al-Dawsari (2012) sees the tribes as existing parallel to the formal governance system and provide social order outside the formal system. She alludes to the strong presence of tribes alongside the state institutions in Yemen to corruption and weakness of the latter (Al-Dawsari, 2012). It is for this reason that tribes are expected to also play a pivotal role in solving water-related disputes.

Saleh handed power over to his deputy Abd Rabbu Mansour Hadi in November 2011, who then formally became the president through election in February 2012. This hand-over resulted from a deal brokered by the Gulf Cooperation Council (GCC) and backed by the international community, and partly due to pressure from popular uprising inspired by the Arab Spring elsewhere in the Middle East and North Africa (MENA) region.

Hadi and his Government were tasked with restructuring the military-security apparatus, addressing issues of transitional justice and the launch of an inclusive National Dialogue Conference with the goal of revising the constitution before elections in February 2014 (International Crisis Group, 2012). After the handover of power in 2011, the interim administration faced daunting challenges from the old regime, protesters, and regional insurgencies (Thiel, 2012).

One of the challenges is the continuous power struggle (International Crisis Group, 2012). The phenomena of nepotism, patronage, and corruption also persist. The same groups retain control over most of Yemen's resources while relying on patronage networks and dominating decision-making in the government, military, and political parties (International Crisis Group, 2012). Furthermore, the military, which is important to Yemen's security, remains divided and vulnerable to growing attrition, exhibiting loyalties to tribes, regions and individual commanders rather than to state institutions (Fattah, 2014). This corresponds to a general loss of credibility of the nation state (BTI, 2014).

The State still does not exert a monopoly on the use of force. In 2011 and 2012, the Government lost, at least temporarily, control over several governorates (such as Sa'ada or Abyan). Violent incidents occurred in previously calm governorates, such as Ta'izz (BTI, 2014). Governmental control over the periphery in both the north and the south has also declined since 2011 (International Crisis Group, 2012). Intensified efforts by the government to combat of Sunni militants have resulted in dozens of civilian casualties and thus invoked public resentment, which in turn strengthens the position of radical forces (BTI, 2014).

The National Dialogue was held under international supervision with the aim to provide opportunities for the previously politically and socially marginalized groups, to press for new terms of inclusion (Hill et al., 2013). However, the National Dialogue are viewed by some political activists as a tool to keep the political elites from different parties at peace with each other, rather than aiming to provide long-term solutions for Yemen

(Murray, 2013). Therefore, previously marginalized groups such as women and youth, including those who helped bring about change, are not included in a proper manner (for example, being given sufficient seats or informed in a timely manner) to participate in decision-making under the post-Saleh government (Murray, 2013). In addition, the extent to which the resulting recommendations will be implemented is still uncertain, as there may be little space left for new players when established political parties look set to dominate the next parliament and fill the power vacuum (Hill et al., 2013).

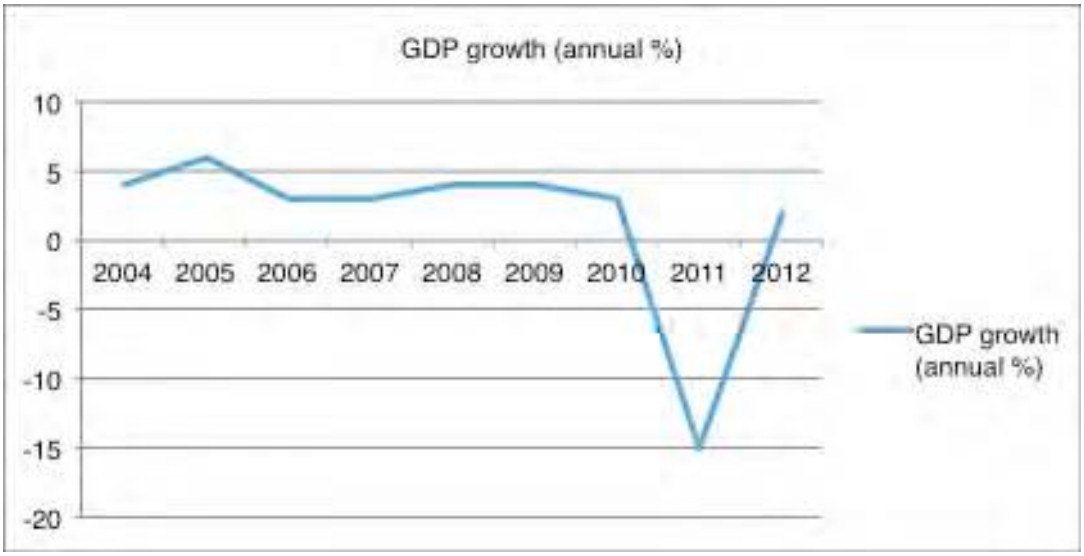
4.2 Socio-economic dimension

4.2.1 Yemeni economy

Being the poorest country of the Middle East, Yemen is dependent on small oil reserves, agricultural and fishery exports, and development aid to sustain its economy. The Yemeni economy suffered from its support for Iraq during the first Gulf War (1990-1991). Saudi Arabia expelled 1 million Yemeni workers, and together with Kuwait it reduced its economic aid. The decline in remittances from Yemeni expat workers had an enormous impact on its economy. Since mid-1990s, Yemen has been relying on multilateral development aid to sustain its economy (WFP, 2009). Due to its dependency on this aid, the government of Yemen is introducing economic reforms aimed at reducing this dependency, as well as a result of aid regulations. Yemen also needs to change its economy because of its current dependency on the oil market, which leaves the national budget vulnerable to the volatility of the international oil prices, while knowing at the same time that under the current rate of production the oil reserves will not last beyond 2020 (EC, 2006; WFP, 2009).

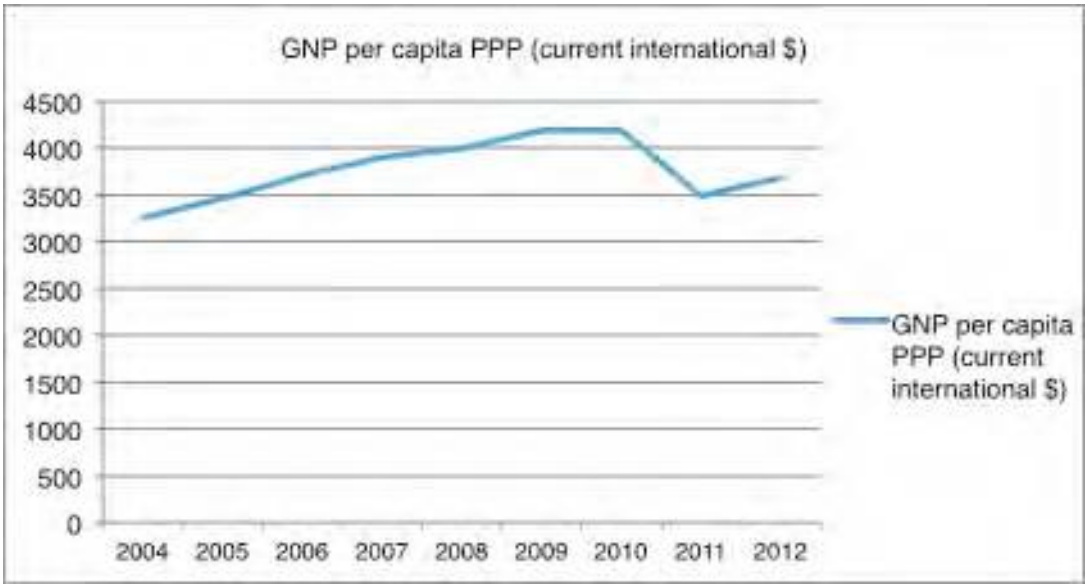
As shown in Figure 4.1, Yemen's GDP growth rate remained on average 3 to 4 percent between 2004 and 2010, with a sudden drop of 15 percent in 2011. It was slowly recovering again in 2012 at 2 percent. GNP per capita at purchasing power parity had been increasing steadily until 2011 and recovered slightly in 2012 (see Figure 4.2). The coincidence of the dips in GDP growth rate and GNP per capita during the revolution in 2011 shows its effect on the Yemeni economy. Both state resources and human resources/work force have been diverted from economic development to the political developments at the time, and economic activities in key sectors were likely disrupted.

Figure 4.1: Annual GDP growth rate in Yemen



Source: World Bank

Figure 4.2: GNP per capita PPP in current international dollars



Source: World Bank

4.2.2 Population and health

The Yemeni population has been growing at an annual rate of 3 percent from almost 20 million in 2005 to 24.5 million in 2012 (see Figure 4.3). Several social development indicators show a steady trend of improvement over the period of 1994 and 2012 (the period during which data are available on all mentioned indicators, example of data at three points in time are show in Table 4.1).

Table 4.1: Social indicators

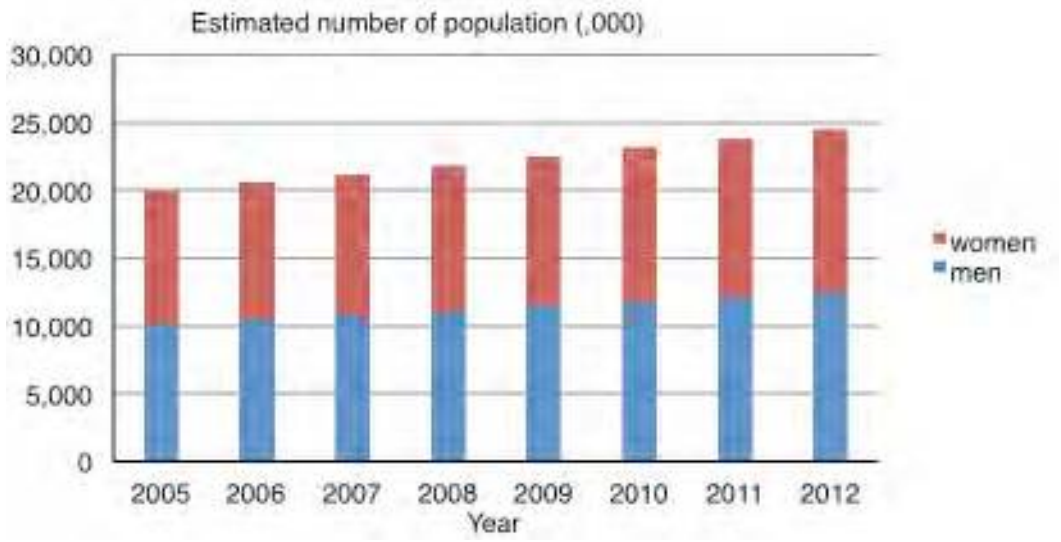
Social indicator	1994	2004	2012
Death rate, crude (per 1,000 people)	11	8	7
Birth rate, crude (per 1,000 people)	47	36	31
Life expectancy at birth, male (years)	58	60	62
Life expectancy at birth, female (years)	60	63	64
Fertility rate, total (births per woman)	7.8	5.6	4.2
Immunization, DPT (% of children aged 12-23 months)	33	78	82
Maternal mortality ratio (modelled estimate, per 100,000 live births)	420 (1995)	330 (2005)	270 (2013)
Literacy rate, adult total (% of people aged 15 and above)	37	55	66

Source: World Bank

Despite the improvement in the abovementioned areas, we would like to highlight a few discrepancies in other equally important socio-economic indicators. The first discrepancy is in the infant and child mortality. The population is relatively young as can be seen in the population pyramid in Figure 4.4. Although child mortality has steadily declined since 1990 according to data published by WHO, the high child mortality is still shown by the gap between the 0-4 and 5-9 age groups. Under-five mortality per 1,000 live births has decreased from 128

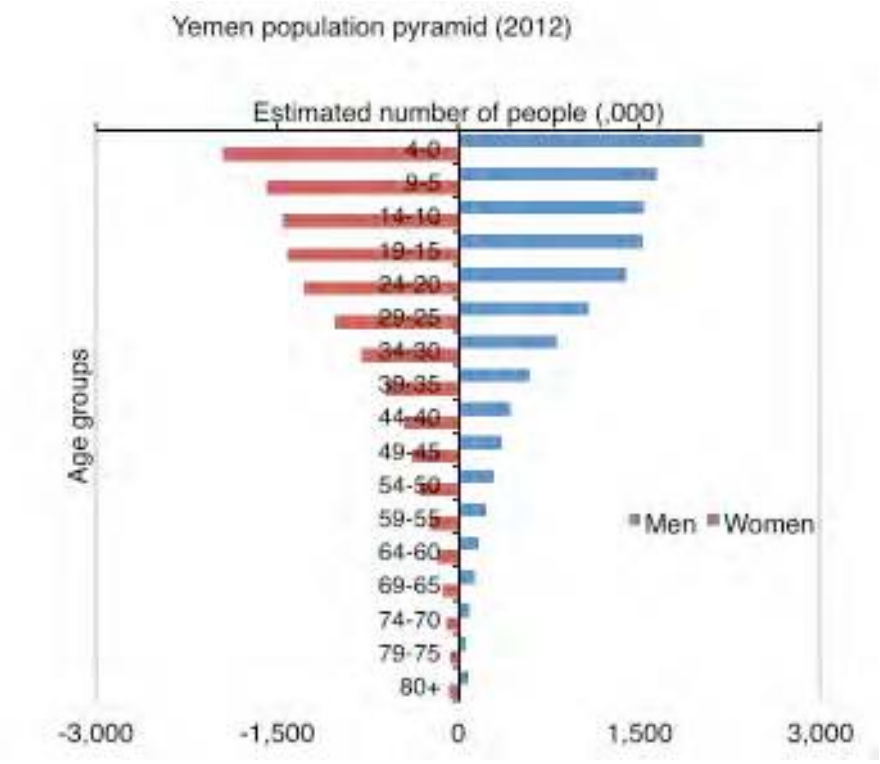
in 1990 to 60 in 2012, according to the latest data by UNDP and UNICEF. At the same time, the infant (under one-year old) mortality per 1,000 live births has also seen a drop from 88 in 1990 to 46 in 2012 according to the same dataset by UNICEF. Despite the improvements, infant and child mortality rates in Yemen are still high compared to the global norms, with the global infant mortality rate being 35 in 2012 (WHO statistics) and the global child mortality rate being 51 in 2011 (UNICEF, 2012). Diarrhoeal diseases are a main contributor to the high mortality rate. Closely following acute lower respiratory infections, diarrhoeal diseases are the second most common cause of deaths among children under five years of age (see Figure 4.5). It is likely that the diarrhoeal diseases are mostly related to polluted water sources and poor hygiene conditions, which will be discussed in Section 4.2.3.

Figure 4.3: Population estimation 2005-2012



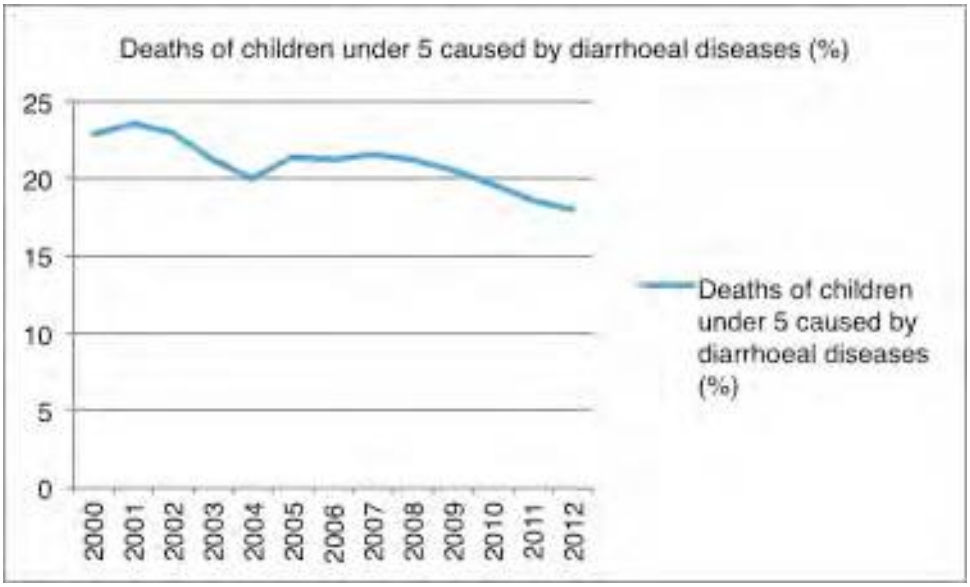
Source: Central Statistical Office Yemen

Figure 4.4: Yemen population pyramid 2012



Source: Central Statistical Office Yemen

Figure 4.5: Deaths of children under five caused by diarrhoeal diseases as a percentage of all under-5 deaths in Yemen 2000-2012

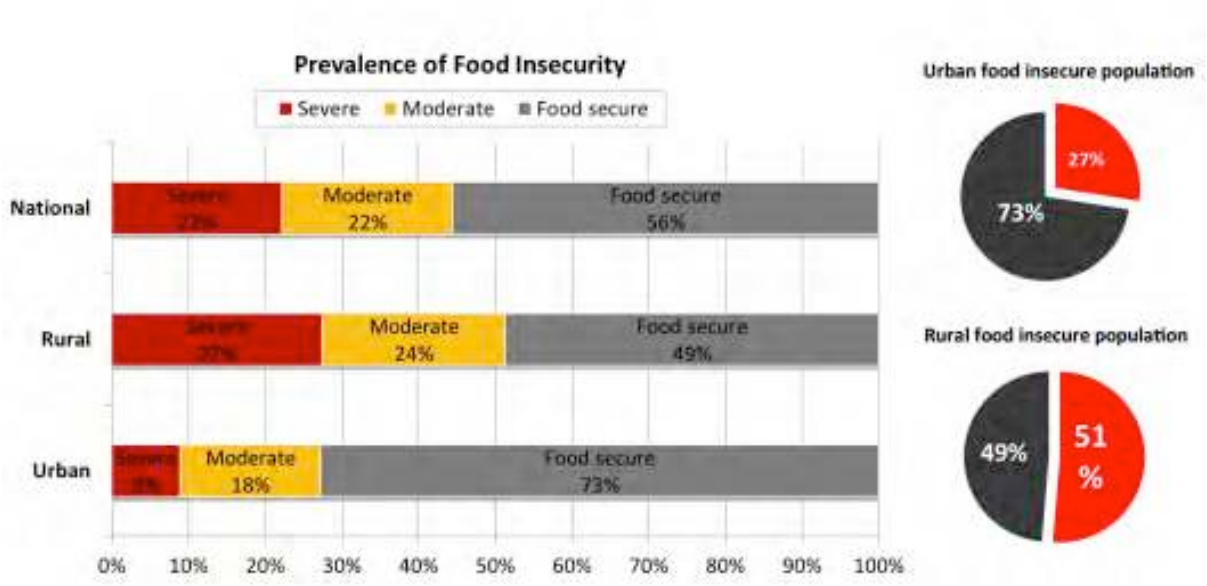


Source: WHO statistics from the Global Health Observatory Data Repository

The second discrepancy relates to food security. Between 2010 and 2012, Yemen's food security situation worsened. There had been a doubling of the number of severely food insecure people, and nearly half of the Yemeni population did not have enough to eat as of 2012 (WFP, 2012). WFP's report shows a marked difference between rural and urban areas, particularly with regard to severe food insecurity and food

insecurity (see Figure 4.6). Children are most affected by food insecurity, with 47 percent of all children under five years old being chronically malnourished and 13 percent suffering from acute malnutrition (WFP, 2012), which projects a grim outlook for Yemen's future development.

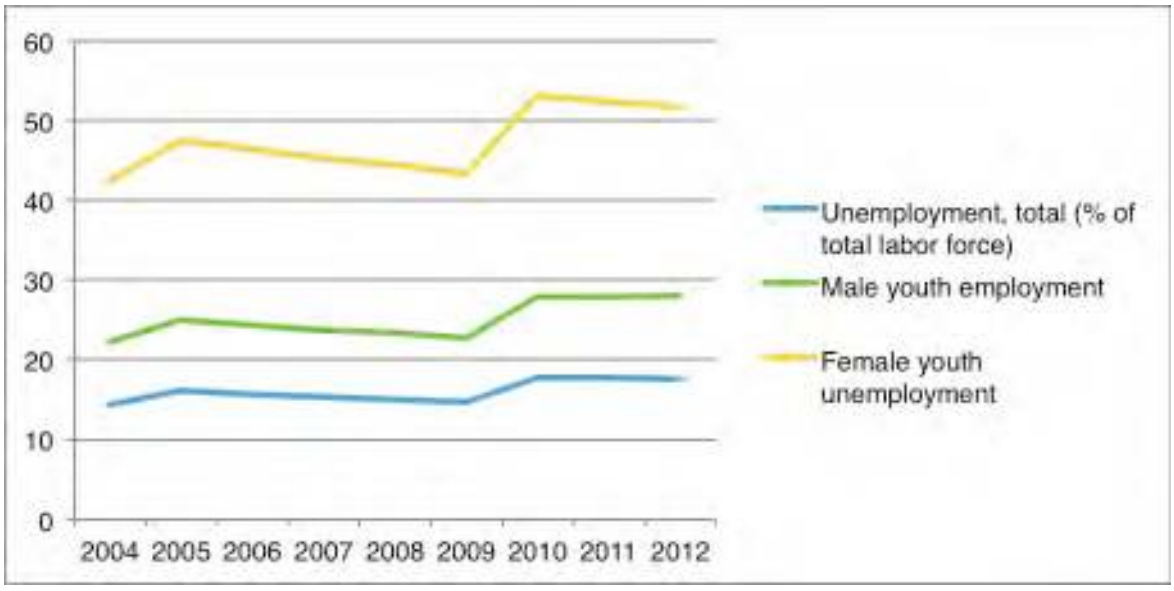
Figure 4.6: Prevalence of different levels of food insecurity in Yemen



Source: WFP 2012

The third discrepancy is unemployment, which is shown in Figure 4.7.The unemployment rate in general and for youth (both male and female) declined slowly, but steadily until 2009, while in 2010 a relatively sharp rise occurred. It is possible that the increasing unemployment rate contributed to the revolution in 2011. In addition, the high unemployment rate among youths, particularly for women, may serve to sustain social instability in the country.

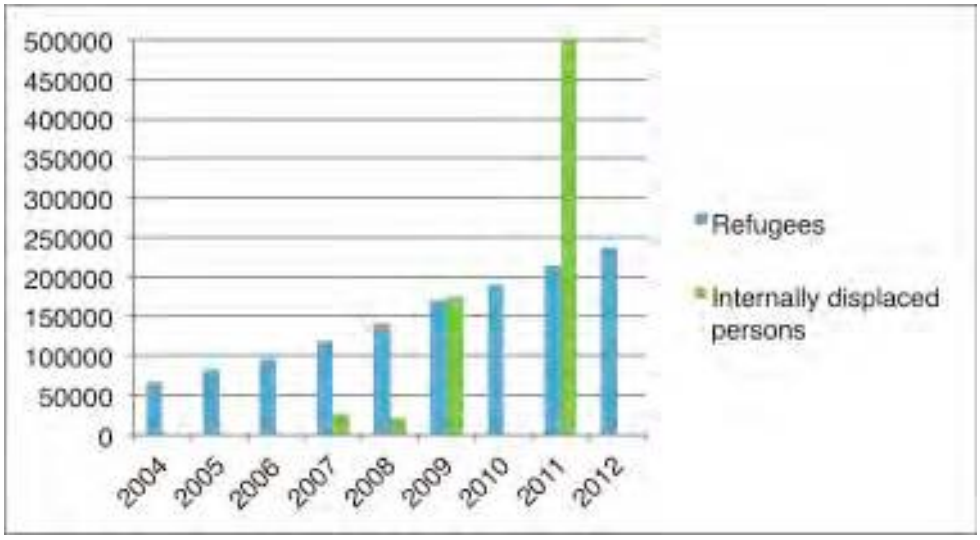
Figure 4.7: Unemployment rate in Yemen 2004-2012



Source: World Bank

Last but not least, the constant increase of refugees from the Middle East and the Horn of Africa, as well as a dramatic surge in internally displaced persons after the revolution in 2011 (see Figure 4.8) may exacerbate the food security and unemployment situations.

Figure 4.8: Number of refugees and internally displaced persons in Yemen 2004-2012



Source: World Bank

4.2.3 Water and sanitation

The well-being of the Yemeni population is undermined by the lack of access to improved water sources and sanitation in both urban and rural areas. The percentage of the population with access to improved sanitation facilities has risen from just over 20 percent to around 50 percent between 1990 and 2012 (see Figure 4.4), although the percentage gap between urban and rural populations is significant as of 2011 (see Table 4.2, also Figure 4.5, Figure 4.11). The improvement of sanitation facilities may partially explain the decrease in the percentage of deaths of under-5 children caused by diarrhoeal diseases in the past decade. An assessment of various governorates found that in rural areas 14.8 percent of the people surveyed mentioned they exclusively defecate in the open and more than half partly defecate in the open. The report also mentions that in 96 percent of the rural sites there are no garbage facilities, whereas the figure is 87 percent in urban areas. In many places, there are reports of pits and ponds where water accumulates and vector diseases are a threat (WCPY, 2012).

The percentage of population with access to improved drinking water sources has declined over the same period (see Figure 4.9). An assessment of various governorates identifies one of the main causes reported of unreliable water provision to be a lack of maintenance. In rural areas, over a third of the population spend more than 30 minutes per trip to fetch water. In both rural and urban areas, over 30 percent of the population are reported to depend on water trucking. In rural areas, 54 percent of the population suffer from water quality related issues, mainly diarrhoea. The gap between urban and rural population is also significant (as shown in Table 4.2 and Figures 4.9 and 4.10). The low rate of access to both sanitation and clean drinking water likely plays a role in the improved but still high infant mortality rate in Yemen.

The government of Yemen is facing major challenges in providing safe and secure water to larger segments of society. One of the major issues is investment in new infrastructure, allocation of scarce resources from agricultural use to drinking water supply, and enforcement of water law and regulations. Difficulties in water

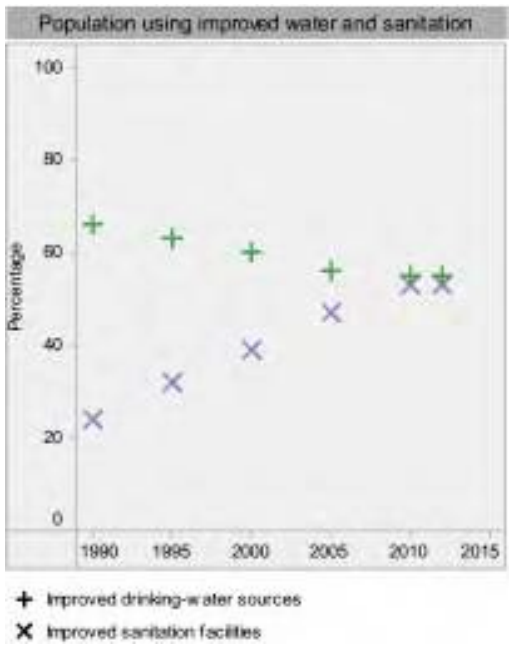
allocations and the increase in water demand and scarcity increase the potential for conflict between urban and rural water users.

Table 4.2: Use of improved drinking water sources and sanitation facilities in Yemen in 2011

Improved water sources and sanitation facilities	Percentage in 2011
Use of improved drinking water sources, total	54.8
Use of improved drinking water sources, urban	72
Use of improved drinking water sources, rural	46.5
Use of improved sanitation facilities, total	53
Use of improved sanitation facilities, urban	92.5
Use of improved sanitation facilities, rural	34.1

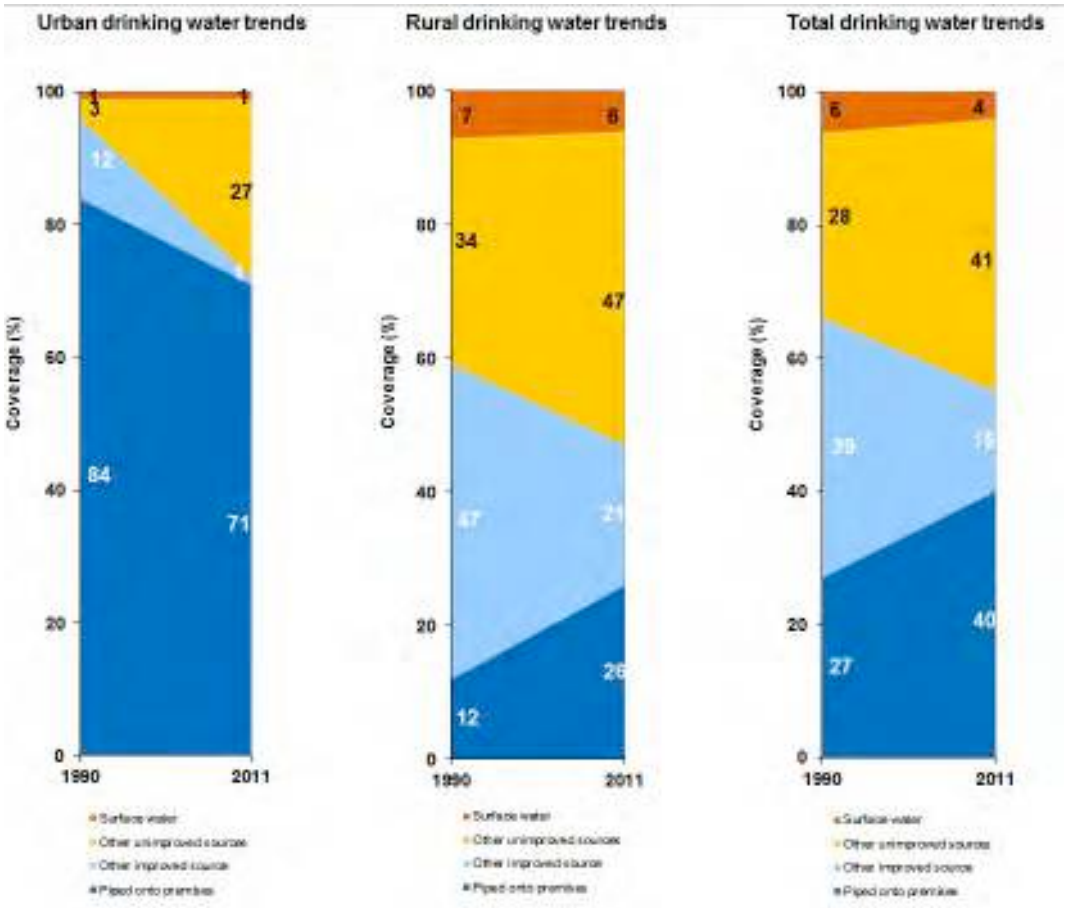
Source: UNICEF 2014, based on statistics from UNICEF, WHO, Multiple Indicator Cluster Surveys (MICS) 2006, and Demographic and Health Surveys (DHS) 1992 and 1997.

Figure 4.9: Population using improved water and sanitation



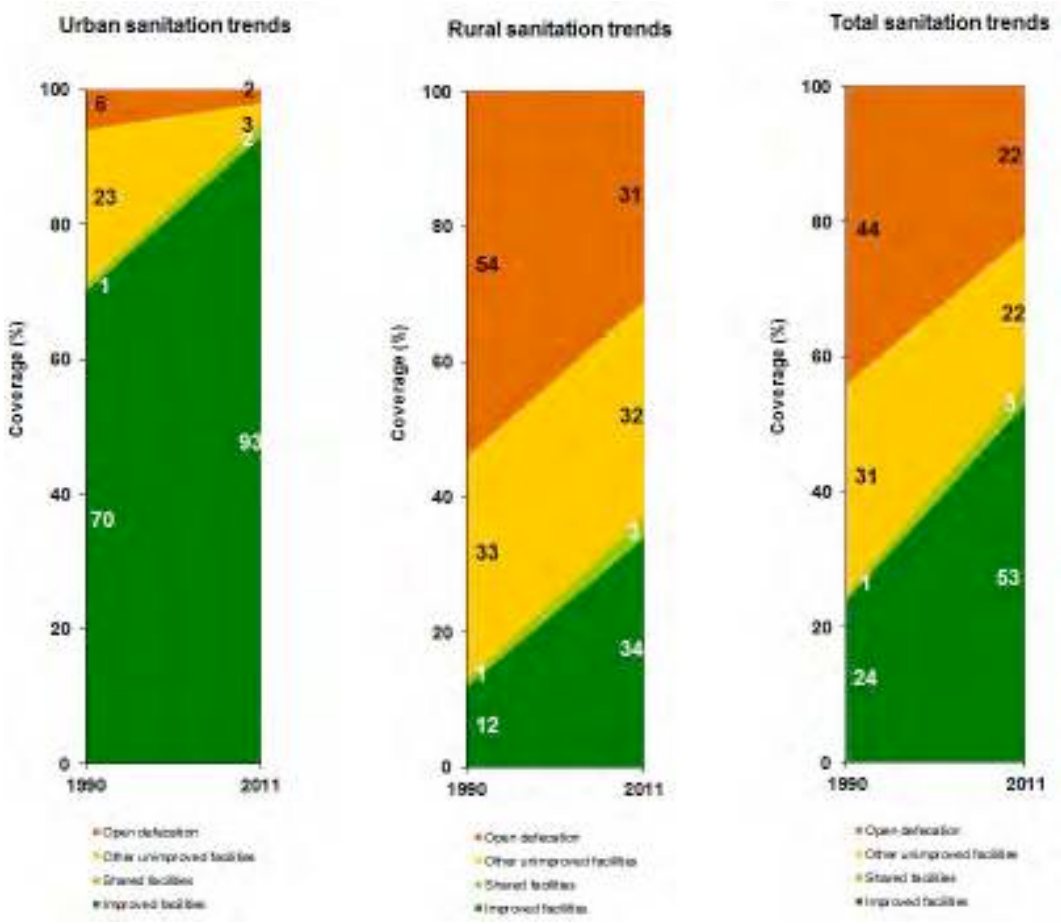
Source: WHO, 2014

Figure 4.10: Estimated trends of drinking water coverage in Yemen



Source: WHO/UNICEF, 2013

Figure 4.11: Estimated trends of sanitation coverage in Yemen



Source: WHO/UNICEF, 2013

4.3 Physical dimension

Water scarcity is regarded as one of the drivers of conflict; an increase in scarcity will result, therefore, in an increase in (potential) conflict. Biophysical processes affect the water resources as changing climatic conditions (rainfall/recharge) will positively or negatively affect the available water resources. Conflict regarding water resources within agricultural populations, and urban residents, and between different uses will affect institutions and policies directed at water resources management. It is likely that an increase in (potential) conflict (resulting from an increase in water demand) will result in increasing water resource flows to both agriculture and urban residents to reduce conflicts over water. In this way, an increase in (potential) conflicts will negatively affect the available water resources (as conflict hypothetically can be settled by increased water allocation), this can be aggravated due to changing climatic and biophysical processes. Increase in water use also causes higher polluted return flows, possibly reducing the available water supply for downstream users.

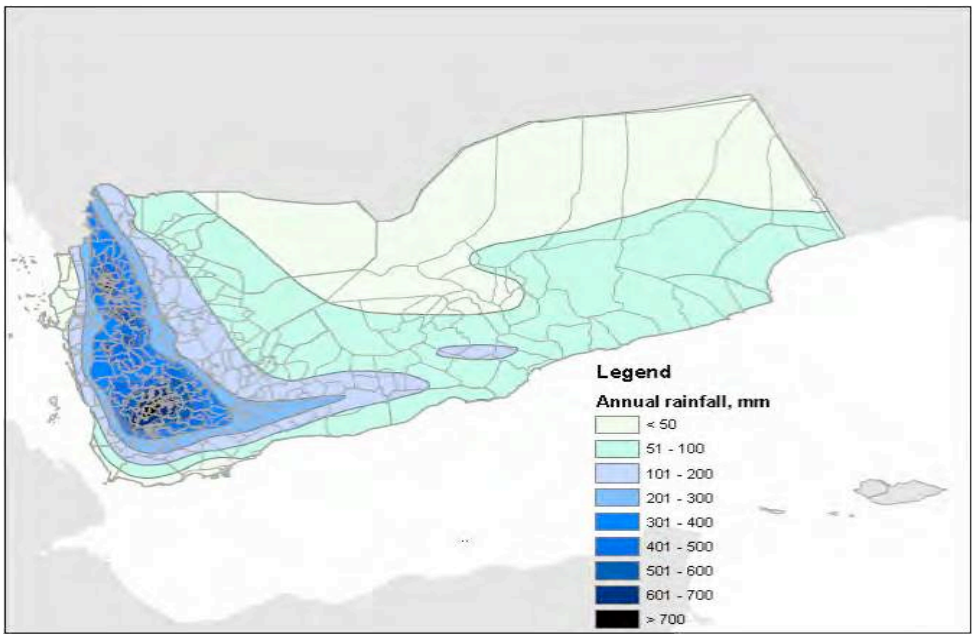
4.3.1 Climatic characteristics

Water scarcity is severe in Yemen. Yemen has a semi-arid to arid climate with widely varying rainfall across different regions, as shown in figure 4.12 (MetaMeta Research and PAN Yemen Consult 2013). In addition to rainwater, Yemen also relies on groundwater and (spate) floods for its water supply. Figure 4.13 shows the annual temperature and rainfall distribution in the three case study areas. Coastal areas (such as Al Hudaydah)

receive 80 percent of the annual rainfall during the winter months, while rainfall in the highlands (such as Ta'izz and Sana'a) follows two distinct rainy seasons (the *saif*: April-May and the *kharif* (July-September).

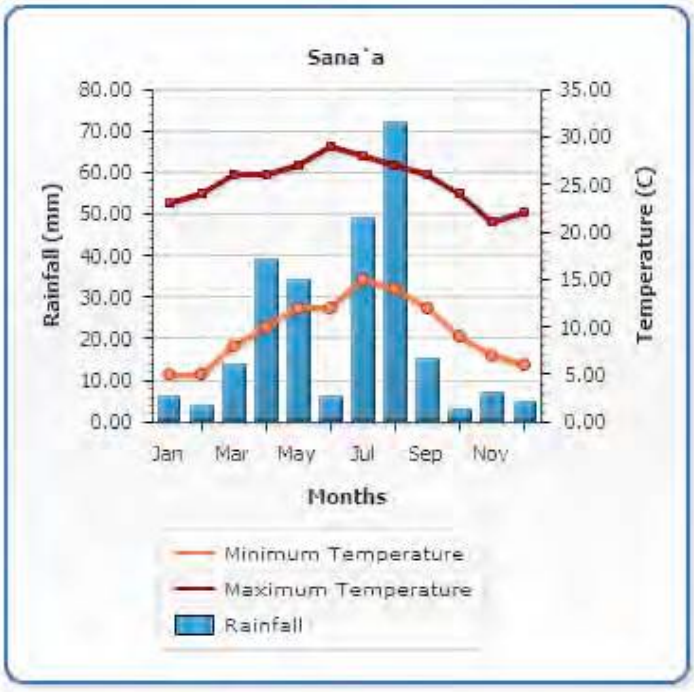
Yemen can be divided into six agro-ecological zones (see Figure 4.14), with different climatic characteristics as well as the types of (agricultural) land use, and thus water demand (and availability). It is, therefore, almost impossible to generalize climatic conditions and possible scenarios for Yemen as a country.

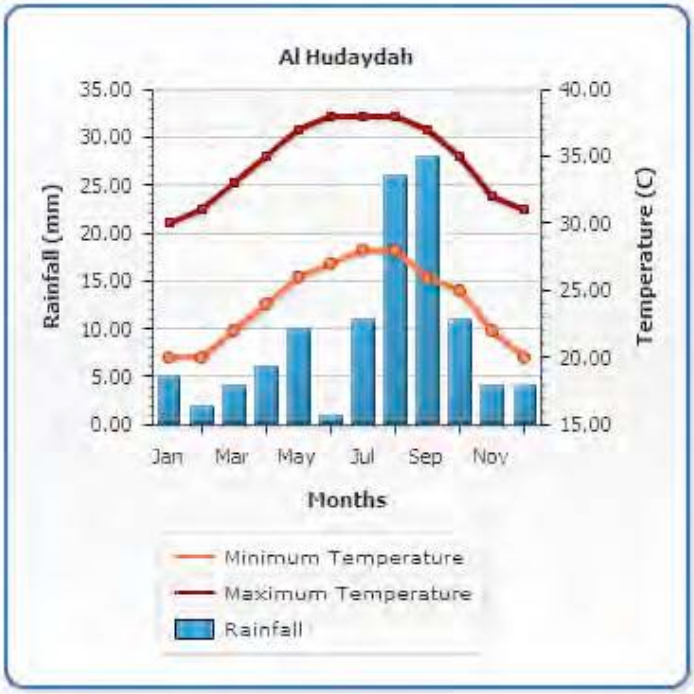
Figure 4.12: Annual precipitation

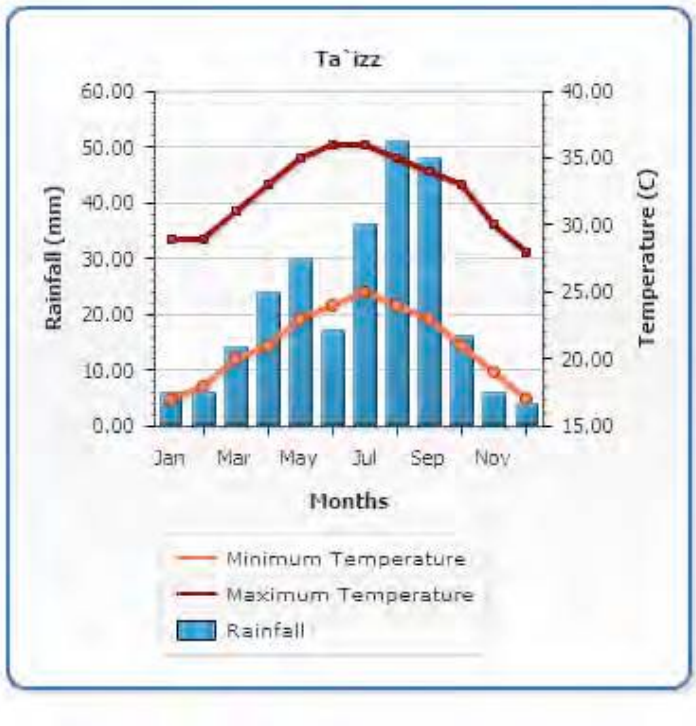


Source: WFP 2009

Figure 4.13: Annual temperature and rainfall distribution in three areas

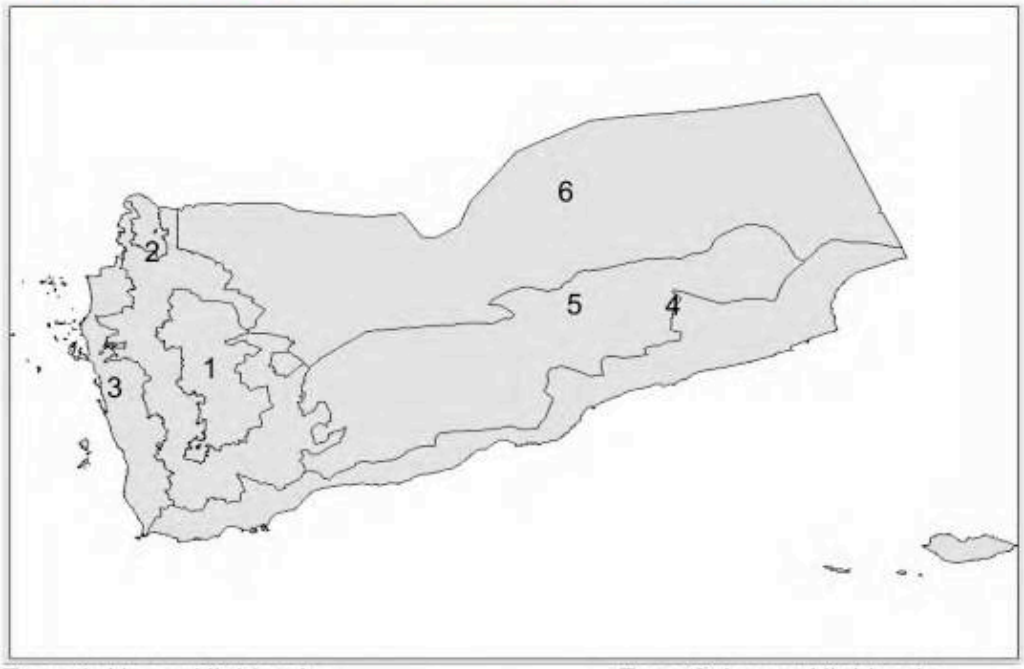






Source: World Bank, Climate Change knowledge portal: http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=YEM&ThisTab=ClimateBaseline

Figure 4.14: Yemen Agro-ecological zones



Source: IFPRI, 2011

4.3.2 Climate change

The International Food Policy Research Institute (IFPRI) (2011) climate change study reports yield changes over time due to climate change that are projected to vary strongly across the agroecological zones, as well as across major staple crops (millet, sorghum, and wheat). IFPRI (2011) uses two climate models, CSIRO and MIROC, for the development of its climate scenarios for the year 2050 in relation to the 2000 baseline. The two models come with different results for temperature and rainfall scenarios (the main climatic variables). The CSIRO scenario shows maximum increase of 1.7°C for the maximum temperatures and a maximum increase of 2.3°C for the average temperatures. The MIROC model shows much greater variability for both minimum and maximum temperatures which are projected to rise above 3°C.

Based on their climatic model, Haidera et al. (2011) conclude that current and predicted patterns of water consumption will soon fully deplete available resources in Yemen. Current and predicted human consumption patterns are a bigger driver of vulnerability than climate change. In the absence of new strategies to bring water supply and demand patterns into balance, results for all three case studies (Sana'a, Aden and Sa'ada) suggest the pressing water crisis will only worsen (Haidera et al., 2011). As also mentioned by IFPRI (2011), this means that especially in certain regions of Yemen climate change or variability can have a dramatic impact in the available water resources (MAI, 2012). As Yemen is a food (and virtual water) importing country and climate change is expected to increase food prices globally it will affect Yemeni people in multiple ways, because at the same time when food prices increase it will be an extra incentive to invest in agricultural production.

Agricultural productions and farmers will be affected by climate change or climate variability (mostly warmer temperatures and more unpredictable rainfall from heavier showers). If water is available (and the trend is negative), higher temperatures can increase production, under the optimistic scenario (hot and wet) crop production can increase by 10 percent; under the pessimistic scenario however (hot and dry) it can go down by more than 10 percent (MetaMeta Research and PAN Yemen Consult, 2013).

4.3.2 Water availability

Yemen ranks 7th on the Water Stress Index (Maplecroft, 2011). The Government recognizes the water scarcity situation and, in its National Water Strategy, ranks water only second to national security (MetaMeta Research and PAN Yemen Consult 2013). Nevertheless, this priority in rhetoric does not seem to have been translated into sound water management practices, as will be further explained later in the section.

Groundwater irrigated areas increased from 37,000ha in 1970 to 407,000ha in 2004, while rainfed areas shrunk from 1,200,000ha to 460,000ha in the same period (RoY, 2005). While 4 to 15 percent water saving in irrigated agriculture can be realized by improved irrigation methods, a dramatic intervention is required to reverse the increase in agricultural water consumption (MetaMeta Research and PAN Yemen Consult, 2013).

Groundwater is currently the key water resource in Yemen, but is being overexploited. The rate of pumping exceeds the rate of recharge and the groundwater levels of basins decline annually on average by 1 to 4 meters. Farmers near Sana'a in Yemen have deepened their wells over 50 meters over the past decades, while the amount of water they can extract has dropped by two-thirds (UNDP, 2006). This raises the cost of pumping and, in certain cases, causes a deterioration of groundwater quality including seawater intrusion in the coastal plain areas. The declining water table has implications for the depth of wells required to extract water and the risk of salt intrusion (UNDP, 2006; MAI, 2012).

Other sources of water (surface water and spate floods), which also influence the recharge of groundwater, are not readily available due to highly variable annual rainfall patterns. Infrastructure has been constructed by the Yemeni Government to make better use of the surface and spate flows. The Ministry of Agriculture and Irrigation (MAI) considers expansion of water infrastructure (dams) to expand agricultural production of the (spate) irrigation systems (MAI, 2012). There are currently over 50 diversion weirs and main distribution canals (Yehya and Al-Asbahi, 2005). Dykes are built on main wadis to direct spates into irrigation systems. Approximately 120,000-150,000ha in the low lands of the country are irrigated by spate systems. There are also around of 800 medium and small dams for rainfall water harvesting in the highlands (Yehya and Al-Asbahi, 2005).

Although real time data on water availability and monitoring systems are insufficient in Yemen, Table 4.3 shows that an unsustainable amount of water is used. The area under irrigation in Yemen is still increasing. MetaMeta Research and PAN Yemen Consult (2013) estimate that 4-15% water saving in irrigated agriculture can be realized by improved irrigation methods. They conclude that a dramatic intervention is required to reverse the increase in water consumption.

Table 4.3: Use of Water for a Period of 20 Years (1990-2010) in Different Water Use Sectors (Mm3/Yr)

	MAI (2013)	Yehya and Asbahi, 2005)	MAI (2013)	Yehya and Asbahi, 2005)	Yehya and Asbahi, 2005)	MAI (2013)	Yehya and Asbahi, 2005)	(MetaMeta Research and PAN Yemen Consult, 2013)
Agriculture	2700	2600	2988	3145	3235	3261	3328	20.8%
Domestic / Municipal	166	168	300	210	265	553	552	233%
Industrial and Mining	31	31	72	45	65	109	90	251%
Total	2897	2799	3360	3400	3565	3923	3970	35.4%
Deficit	400		860			1420		255%

Source: MAI 2013, Yehya and Asbahi 2005, MetaMeta Research and PAN Yemen Consult 2013

4.3.3 Agriculture

Despite contributing to only 8.4 percent of Yemen's GDP in 2011, agriculture is by far the largest water user and accounts for 85 percent of the total water use. It is also the sector a large part of the Yemeni population, who are rural, is dependent on for their livelihoods. Table X provides an overview of how much different crops contribute to the Yemeni GDP.

Qat

Figure 4.15 shows the structure of the Yemeni economy by sector. The most produced crop in Yemen is sorghum, the production area of which has been increasing over the last decade. In addition, the cropped areas of wheat, millet, and qat are also increasing. Qat, in particular, has a major contribution to the national GDP and is at the same time a more profitable commodity than the other main crops in Yemen. Consequently, despite the lack of production improvement over the past decade and the fact that the irrigation of qat consumes a third of the total annual groundwater abstraction, qat has not been replaced by other crops. Various reports have been written about the impact of qat on the Yemeni environment, economy, and society (including health issues due to pesticide use). The following aspects of qat production and consumption

demonstrate its socio-economic importance (and thus impact on the society and environment) (from MetaMeta Research and PAN Yemen Consult 2013, based on their analysis of other reports, p.14):

- Average qat consumption requires 10 percent of people's income; expenditures on qat are of the same order of magnitude as expenditures on health. For the affluent population qat expenditures are even higher.
- Qat production represents 6 percent of the country's GDP in 2005;
- Nearly one third of the agricultural labor force is engaged in qat production making it the second largest source of employment in the country and exceeding employment in the public sector;
- Net profits range from YER 400,000 to YER 1,800,000 per ha (US$2,500 to US$11,000 per ha);
- Formal consumption tax of 20 percent on qat sales, but the collection rate of this tax is very low: suggestion has been made to improve enforcement or to reduce the consumption tax to 10 percent to increase the total tax revenue;
- One-third of the total annual groundwater abstraction of 1.5 BCM is used for irrigating qat; and
- Qat is 10 to 20 times more profitable than most competing crops.

Figure 4.15: Structure of the Yemeni Economy by sector

	GDP	Private consumption	Export share	Export intensity	Import share	Import intensity
Sorghum	0.3	0.6	0.0	1.4	0.0	0.4
Maize	0.1	0.8	0.0	1.3	1.1	68.9
Millet	0.1	0.2				
Wheat	0.2	5.4	0.1	6.2	8.7	93.6
Barley	0.1	0.2				
Other grains	0.0	2.4			3.8	99.8
Fruits	0.9	1.5	0.5	12.0	0.3	10.0
Potatos	0.4	0.7	0.2	9.3	0.0	1.1
Vegetables	1.1	2.3	0.1	2.0	0.1	3.2
Pulses	0.2	0.4				
Coffee	0.2		0.5	54.7	0.0	2.6
Sesame	0.0		0.0	10.4		
Cotton	0.1		0.0	5.3	0.0	3.3
Qat	2.8	5.5				
Tobacco	0.2	0.8			0.8	61.1
Camel	0.1		0.5	71.0	0.0	15.5
Cattle	0.4		0.1	2.3	0.2	10.0
Poultry	0.6				0.5	10.5
Goats and sheep	0.4		0.1	3.1	0.3	15.7
Fish	0.3		0.0	0.1	0.0	0.3
Forestry	0.2	0.7			0.5	41.9
Mining	22.5	1.0	88.7	95.0		
Food processing	4.0	26.5	1.5	3.6	13.9	33.8
Other industry	10.9	18.8	1.2	1.9	69.7	61.3
Utilities	1.2	1.9				
Services	53.1	30.4	6.6	2.2		
Total, of which:	100.0	100.0	100.0	18.0	100.0	24.0
Agriculture	8.4	21.5	2.1	4.5	16.3	34.4
Nonagriculture	91.6	78.5	97.9	19.2	83.7	22.7

Source: Yemen DCGE Model.
Note: Import intensities are calculated as shares of total domestic consumption (final and intermediate). Export intensities are th ratios of exports to domestic production.

Source: IFPRI, 2011

Irrigation water management and efficiency

Yemeni wadis in the western and southern regions of the country contribute to considerable (spate) irrigated areas. Groundwater is responsible for irrigating 27 percent of the total cropped area (MetaMeta Research and PAN Yemen Consult, 2013). Groundwater use is increasing and, because of a lack of mechanisms on the part of the Yemeni Government to allow for appropriate groundwater recharge, the water table is declining. Estimating the recharge of all kinds of subsurface flows is much more difficult than estimating abstraction, different models of different organizations result in a high variety of recharge rates, which again does not contribute to solving conflicts of groundwater management.

The overall irrigation efficiencies in Yemen are low (35 to 40 percent), with much room for improvement. Nevertheless, while modern irrigation techniques could result in localized reduction in groundwater use, there is little evidence of a beneficial impact on the overall water balance, due to the lower recharge available (NWSSIP Update, 2008). Moreover, a caveat of modern irrigation techniques is the potential reduction in energy consumption for irrigating a unit of land, which may lead to an expansion of irrigated land and in turn increase the demand for water.

4.4 Conclusions

This chapter provided a brief overview of the local physical, socio-economic, political and legal-institutional structures, which lessen but also intensify shape and distribute the conflict in Yemen. Yemen is a fragile state that is experiencing both violent and non-violent conflicts. Moreover, it has recently emerged from the 33-year rule by former President Ali Abdullah Saleh. President Saleh created a complex system of nepotism and patronage, in which democratic institutions could not properly enforce checks and balances. These institutions were influenced by elites that possessed power over them due to their proximity to the regime. The system and its related challenges have persisted through the current transitional period. Water management in general has benefitted Yemeni elites to the detriment of society at large, while the lack of accountability has led to unsustainable exploitation of water.

All of this has taken place against a background of widespread poverty and a lack of availabile water. Although there has been a steady improvement in some socio-economic indicators during the past two decades, the progress in other important indicators (in particular infant and child mortality, food security, and unemployment) has been inconsistent. Some of the latter have likely contributed to the revolution in 2011 and all of the latter were disrupted by the revolution in 2011.

Socio-economic factors, compounded by physical conditions and changes, render Yemen vulnerable to the impacts of climate change and prone to conflicts between water users. Water-related challenges (both in quantity and quality) linger and threaten to undermine any socio-economic development made as well as to prevent future development. UNDESA (2011) mentioned two reports from 2003 and 2010 by the Yemeni Ministry of Planning and International Cooperation, which concluded that Yemen was off-track with respect to meeting the Millennium Development Goals.

The largest water user, the agricultural sector (with qat being an important crop in terms of monetary values and water consumption) uses a high proportion of the limited rain water, ground water, and (spate) flood water available and is highly inefficient. The Yemeni Government is facing major obstacles in providing safe and secure water to larger segments of society.

4.5 References

Al-Dawsari, N. 2012. *Tribal Governance and Stability in Yemen*. Middle East Series, Carneige Papers. Washington D.C.: Carnegie Endowment for International Peace.

Al-Zwaini, L. 2012. *The Rule of Law in Yemen: Prospects and Challenges*. HiiL Rule of Law Quick Scan Series. The Hague: HiiL, September 2012.

BTI. 2012. *Yemen Country Report*. Gütersloh: Bertelsmann Stiftung.

BTI. 2014. *Yemen Country Report*. Gütersloh: Bertelsmann Stiftung.

European Commission. 2006. *Yemen - European Community Strategy Paper for the Period 2007-2013*. Brussels: European Commission.

Fattah, K. 2014. "The Repercussions of the GCC Tension in Yemen." http://carnegieendowment.org/sada/2014/04/08/repercussions-of-gcc-tension-in-yemen/h7fx.

Haidera, M., Alhakimi, S.A., Noaman, A., Al Kebsi, A., Noaman, A., Fencl, A., Dougherty, B. and Swartz, C.. "Water Scarcity and Climate Change Adaptation for Yemen's Vulnerable Communities." *Local Environment* 16 (5): 473–88.

Hill, G., Salisbury, P. Northedge, L. and Kinninmont, J. 2013. *Yemen: Corruption, Capital Flight and Global Drivers of Conflict*. London: Chatham House.

IFPRI. 2011. *Climate Change and Floods in Yemen. Impacts on Food Security and Options for Adaptation*. IFPRI Discussion Paper 01139. Washington D.C.: International Food Policy and Research Institute. http://reliefweb.int/sites/reliefweb.int/files/resources/ifpridp01139.pdf.

International Crisis Group. 2012. *Yemen: Enduring Conflicts, Threatened Transition*. 125. Middle East Report. Brussels, International Crisis Group.

MAI. 2012. *A Promising Sector for Diversified Economy in Yemen: National Agriculture Sector Strategy 2012-2016*. Sana'a, Yemen: Ministry of Agriculture and Irrigation of Yemen.

Maplecroft. 2011. *Water Stress Index 2011*. Retrieved online December 2013: http://maplecroft.com/about/news/water_stress_index.html.

MetaMeta Research, and PAN Yemen Consult. 2013. *Study on Strategic Orientation and Reorganization of the Irrigation Sector*. 62/CS/IRR/WSSP/11. Diagnostic Report. 's Hertogenbosch, the Netherlands: MetaMeta Research.

Murray, R. 2013. "Yemen Activists 'Sidelined' in Post-Saleh Era." *Al Jazeera*, March 23. http://www.aljazeera.com/indepth/features/2013/03/2013322173524135780.html.

OECD. 2013. *Fragile States 2013: Resource Flows and Trends in a Shifting World*. Paris: Organisation for Economic Co-operation and Development.

Philips, S. 2007. *Evaluating Political Reform in Yemen*. Middle East Series, Carneige Papers. Washington D.C.: Carnegie Endowment for International Peace.

Philips, S. 2011. *Yemen and the Politics of Permanent Crisis*. Oxford: Routledge.

RoY (Republic of Yemen). 2005. *National Water Sector Strategy and Investment Program - NWSSIP. Joint Annual Review. NWSSIP Year 2005 Implementation*. http://www.tc-wateryemen.org/documents/downloads/JARAideMemoire.pdf.

Thiel, T. 2012. *After the Arab Spring: Power Shift in the Middle East?: Yemen's Arab Spring: From Youth Revolution to Fragile Political Transition*. IDEAS Reports - Special Reports. London: London School of Economics and Political Science.

United Nations. 2011. *United Nations Common Country Assessment of Republic of Yemen*. Common Country Assessment. New York: United Nations.

UNDESA 2011. *Assessing Development Strategies to Achieve the MDGs in the Republic of Yemen*. Country study. New York: United Nations Department for Social and Economic Affairs, July 2011.

UNDP. 2006. *Human Developmetn Report 2006. Beyond Scarcity: Power, Poverty and the Global Water Crisis*. New York: United Nations Development Programme.

UNICEF. 2012. *Levels and Trends in Child Mortality*. New York: UNICEF.

WCPY. 2012. *WASH Cluster Partners Assessment of Aden, Abyan, Lahj, Ibb, Al-Dhale and Ta'izz Governates of Yemen*. WASH Cluster Partners, Humanitarian Response. https://yemen.humanitarianresponse.info/system/files/documents/files/WASH%20cluster%20assessment%20report%20%28draft%29%20for%206%20Governorates.pdf].

WFP. 2009. *Yemen: Secondary Data Analysis on Food Security and Vulnerability. A Secondary Data Analysis - Consolidating Existing Information on Food Security and Vulnerability.* http://reliefweb.int/sites/reliefweb.int/files/resources/8ADFA0728094617C85257633006659D7-Full_Report.pdf.

WFP. 2012. *The State of Food Security and Nutrition in Yemen. Summary and Overview. 2012 Comprehensive Food Security Survey.* Yemen: World Food Programme.

WHO. 2014. *Yemen: Health Profile*. Geneva, Switzerland: World Health Organization, May 2014.

WHO/UNICEF. 2013. *Estimates on the Use of Water Sources and Sanitation Facilities*. Joint Monitoring Programme Water Supply and Sanitation. Yemen: WHO/UNICEF, April 2013.

Yehya, Q., and Al-Asbahi, A.M. 2005. "Water Resources Information in Yemen." In Vienna. http://unstats.un.org/unsd/environment/envpdf/pap_wasess3a3yemen.pdf.

Chapter 5. Analysis of stakeholders in Yemen

Key messages:

- **The Yemen water governance regime is highly fragmented;**
- **National water institutions are limited by capacity;**
- **True power and influence in reforming the Yemen water sector is at the private irrigation farmers who daily manage and operate the large majority of Yemen's available water resources;**
- **Although the Ministry of Water and Environment (MWE) and National Water Resources Authority (NWRA) are officially the main authorities for water resources management, the Ministry of Agriculture and Irrigation (MAI) is more powerful and influential;**
- **The public and private interests can be much intertwined and private agents (irrigation farmer sheiks) can hold public positions;**
- **Due to the pluriformity of the legal institutions there are no specific actors for conflict settlement, it is considered important that conflict mediators (and the like) represent an authority which is considered legitimate by both the accusing and the accused party**

In this chapter we analyze which actors are involved in conflict (resolution) processes? What is their relation to each other and the Government? What are their (customary) roles within society? Which actors are only involved due to the fact that they are affected by the basis of the conflict or benefit therefrom (e.g., drilling a borehole)? What is their interest in the conflict or resolution thereof? What capacities and power do the stakeholders have to steer the conflict resolution process? Are there actors with a mediating role? Have any of these roles, or authorities, changed over time or are likely to change in the foreseeable future?

5.1 The institutional environment of Yemen water management

Due to the increasing awareness of groundwater depletion, the Government of Yemen has committed itself to a sustainable use of the water resources, which was reiterated in an official statement issued at the UN Conference on Environment and Development of 1992 in Rio de Janeiro (EOEARTH, 2008).

Water management responsibilities are divided over many authorities with minimum integration and coordination. Competition over responsibilities is also observed, an official from the Ministry of Agriculture and Irrigation is quoted by Zeitoun (2009) saying that "the NWSSIP (National Water Sector Strategy and Investment Plan) is all about reducing agricultural water use, but what about farmers' livelihoods?" The fragmentation of decision-making in the management of water resources contributes to the deterioration of sustainable water resources management in Yemen. To solve this problem, a Presidential Decree for the establishment of the National Water Resources Authority (NWRA) was issued in October 1995, providing for the merger of the General Directorate of Water Resources of MAWR, the General Department of Hydrology of MOMR and the Technical Secretariat of the previously existing High Water Council. The main duties of the NWRA are (EOEARTH, 2008):

- to prepare water resources policies and strategies;
- to formulate water legislation and regulations along with their enforcement;
- to undertake water resources studies, evaluation and planning; and

- to carry out management at basin level, as traditional centralized management has proved to be inadequate.

The new authorities, however, have difficulties in positioning them in the water governance system. They lack legitimacy, bargaining power, and implementation capacity (Zeitoun, 2009).

5.2 Stakeholders in the Yemen Water Sector

Many stakeholders from the international to the local level can be identified in water conflicts in Yemen and include central and local governments, traditional leaders, NGOs, the private sector, media, farmers, and domestic water users. As Yemen is dependent on the international donor community, donors are also powerful actors in steering the Yemeni water sector (Hübschen, 2011). The table below provides a non-exhaustive overview of the many stakeholders involved. As stakeholders position themselves in light of changing perceptions, economic and political realities, in sum changing contexts, Yemeni water governance is highly dynamic. Guided by the *Rada'a Principles*, developed by various donor organizations in cooperation with Yemeni government, legal responsibilities are gradually moving to decentralized public utilities and Local Corporations (LC) (Hübschen, 2011). The overview does not go into depth in the different problem perceptions of the actors on water resources management. Also it does not make any categorization in the variety of religious and tribal leaders. These leaders also require legitimacy in a wide variety of customary and religion-based institutions. These institutions also steer the behaviour of the stakeholders in conflict settlement[12].

Table 5.1: Stakeholders in the Yemen water sector

Institution / Organization	Responsibility and interest	Influence/power
Ministries		
Ministry of Water and Environment	Founded in 2003 and supervises water resources management through the NWRA. Developing water resources on the basis of IWRM; providing clean drinking water and sanitation services, allocating water for other uses; and protecting the environment from pollution and desertification, conserving natural resources and rationalizing their exploitation	The ministry has low implementation capacity resulting in low bargaining power (Zeitoun, 2009)
Ministry of Agriculture and Irrigation	Responsible for formulating policies for water resources, for food security and for crops, livestock, and forestry production, and for coordinating public investment and services in the sector. Have an interest to maintain water allocations for Irrigation and	Better bargaining power than MWE due to vested networks (Zeitoun, 2009) and is responsible for the lion's share of (agricultural) water resources (Hübschen, 2011)

[12] For a comprehensive description of the complexities of socio-cultural religious schools and peoples and its grounding and steering institutions, the work of Salmoni et al. (2010) is referred to.

	Agriculture rather than other water users	
Ministry of Local Administration (MLA)	Enforcing *Law No.4 Regarding Local Authority* (Hübschen, 2011)	Plays a decisive role in the process of decentralization and the establishment of the Local Corporations (Hübschen, 2011)
Ministry of Planning and International Cooperation (MPIC)	Responsible for sustainable development and poverty reduction, and investment planning and programming (Hübschen, 2011)	MPIC headed the high-level Inter-Ministerial Steering Committee in 2007 to coordinate and integrate the actions of ministries engaged in water management and prepare the 2008 National Water Sector Strategy (Hübschen, 2011)
Ministry of Finances	Responsible for allocating financial and investment resources. It also sets the diesel prices	Has the power to tax, and allocates financial resources to other ministries. The ministry has therefore relevant bargaining power in investments in water resources development (Hübschen, 2011)
Departments / District authorities		
National Water Resources Authority	Statutory body with autonomous financial administration, responsible for water resources planning, groundwater monitoring, legislation and licensing, water extraction regulation, property rights control, and public awareness. The develop and implement the National Water Sector Strategy NWSSIP (Hübschen, 2011)	Although the Water Law (2002) identifies NWRA as the sole authority for WRM and law enforcement, the authority is not supplied with more resources, power and autonomy. It has therefore limited implementation capacity, therefore donor dependent (Ward et al. 2007; Hübschen, 2011).
National Water and Sanitation Authority	Responsible for water supply and sanitation service delivery, O&M, and collecting revenues in communities with more than 30,000 citizens	Under influence of international donor community to increase effectiveness and efficiency. It is gradually replaced by decentralized LCs (Hübschen, 2011)
General Authority for Rural Water Supply Projects (GARWSP)	Responsible for planning, design and construction of water and electricity schemes for rural settlements with less than 30,000 residents	In the process of decentralization. 20 branches have been opened in all governates. Until 2008, 11 branches were empowered to carry out the full range of activities. Capacity in personnel, facilities, finances, and administration is limiting the power of the local offices (Hübschen, 2011).
Local Corporations (LC)	15 LCs (in 2011) were responsible for app. 95% of the urban drinking water	Increasing in influence as LCs are replacing the centralized authority of

	supply (Hübschen, 2011)	the NWSA (Hübschen, 2011)
Water Supply department	Implementing department under the MWE for coordinating rural water supplies	Limited power due to limited capacity
Regional development agencies (RDA)	Providing field services to farmers The division of responsibility between AREA and the RDAs with respect to water management is unclear (EOEARTH, 2008)	Limited power in relation to water resources management, also due to unclear responsibilities (EOEARTH, 2008)
Agricultural Research Extension Authority (AREA)	Providing farmers extension services	Limited power in relation to water resources management, also due to unclear responsibilities (EOEARTH, 2008)
Environmental Protection Authority	Reports environmental issues to MWE	Does not have real enforcement power
Knowledge institutes		
Universities	To develop knowledge about water resources and sustainable management of the available natural resources	Low influence (Zeitoun, 2009)
Vocational training centres	To educate professionals in sustainable water resources management, engineering and technology.	Low influence (Zeitoun, 2009)
International donors		
International donors	Financing and investing in improved water resources management, providing technical assistance in development and implementation of programs Promoting principles of IWRM (incl. decentralization) and Water Demand Management Developing the Rada'a supporting decentralization of water resources management and principles of IWRM (Hübschen, 2011)	Due to competition rather than the promoted cooperation among each other, donors are susceptible to be "divided and conquered" by local leaders (Zeitoun, 2009) The Yemeni water sector is heavily dependent on foreign donor support; donors are more powerful than the MWE (Zeitoun, 2009).
Political stakeholders		
Parliamentarians	Political parties and individual parliamentarians have been supporting the irrigation water supply reform (Ward et al., 2007) Personal interest in remaining in seat, which can result in an interest to remain the status quo or in reducing	Legitimacy granted by the people provides bargaining power (Zeitoun, 2009) The position of parliamentarians is strongly linked to patronage systems (Zeitoun, 2009)

	rural poverty. It depends on the constituency (Ward et al.. 2007)	
Army and security officials	Can have personal interests in the conflict (land and water, financial interests), but also can have an interest to settle conflicts.	Force power, networks to parliamentarians, high officials, can be powerful in the local context
Local stakeholders		
Sheiks / tribal leaders / large landowners	Water users, local leaders, influential in legitimizing customary rules or legal rules, monopolizing water rights Contextual dependent Accuser, respondent, or mediator	Non-compliance to legislation, bargaining power in development of infrastructure, force (gun power) (Zeitoun, 2009) Influence and power is related to networks with security officials, parliamentarians, etc. (Anon, 2009) and legitimacy granted by the people
Large (irrigation) farmers	Local water users, interest in resources development for irrigation, domestic water supply, and water for animals Responsible for daily water management and operation of irrigation systems	Have a true implementation power in water resources management. Are strongly supported by the MAI. As most water in Yemen is consumed by irrigation, this group has real power in influencing water use. ((Zeitoun, 2009; Hübschen, 2011)
Small farmers	Local water users, interest in resources development for irrigation, domestic water supply, and water for animals Responsible for daily water management and operation of irrigation systems	Provide authority to sheiks / tribal leaders. Limited bargaining power, because of limited resources. Poverty and wealth are important for the level of power and influence (Zeitoun, 2009)
Religious leaders	Securing socio-cultural values and norms Contextual dependent, but involved in conflict settlement in the light of customary and Islamic rules	Legitimacy granted by the people, and based on the personal social network (security officials, parliamentarians, sheiks, tribal leaders)
The very poor	The very poor have limited access to (irrigation) water resources, the bit more prosperous can have access to shared water resources/tube wells/water conservation technologies (Zeitoun 2009) Improved access to water resources, costs of water are very high because dependent on water vendors,	Very limited, very dependent on more powerful stakeholders (sheiks, tribal leaders)

Women and girls	Women and girls spent in some cases many hours each day for water fetching and are therefore water managers	Women have the same water rights as men according to customary rights, but have very limited voice in decision-making over water resources management.

Although the MWE and its subordinate NWRA are, according to the Water Law of 2002, the sole authority for the implementation of Integrated Water Resources Management, in practice this is not the case. MWE and NWRA are hampered by the fact that they are only in charge of about 5% of the water consumed in Yemen (Hübschen, 2011). The Ministry of Agriculture and Irrigation (and its Department for Irrigation and Dams) is in practice responsible for the main share of water, which is allocated, to agriculture and irrigation. This is the result from a very political process as this mandate was in first instance to be moved to MWE, but was blocked by the president himself (Hübschen, 2011). This fragmentation of responsibilities is problematic as both institutions have different interests and pursue opposing water polices. Zeitoun (2009) analyzed the stakeholders of the Yemen irrigation water sector in the light interests and influence on water demand management, which resulted in the figure 5.1 below.

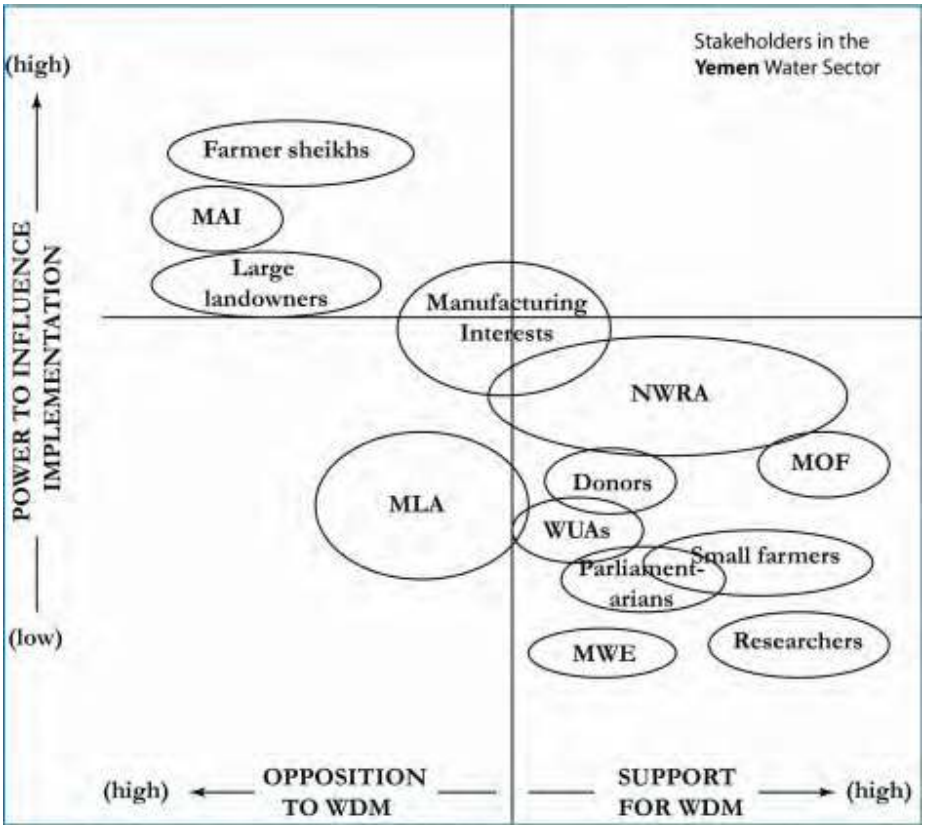


Figure 5.1: Stakeholder analysis Yemen (irrigation) Water Sector in relation to Water Demand Management (WDM) (Zeitoun, 2009)

Figure 5.1 shows that MWE and NWRA are in favour of Water Demand Management strategies, while MAI is in opposition. It also shows that the position of MAI is to support large landowners rather than small farmers. At the same time power and influence are strongly related to wealth; the wealthy have better access to water resources, and have more power and influence to steer water management (Zeitoun, 2009).

The figure and table above display an impressive array of formal institutions in the Yemeni water governance regime. Although the Ministry of Agriculture and Irrigation is regarded as most powerful governmental actor in water managing, the true power in water resources management is at the large landowners and farmer sheiks (private agriculture) (Zeitoun, 2009; Hübschen, 2011). The behavior of these irrigating farmers is thus key to success of reforming Yemen's water sector sustainably (their interest and goals, perceptions, and the resources and power used to change the water management system).

5.3 The instability after Saleh

The supporters of Saleh's regime benefitted from his crony capitalism framework (Hill et al., 2013), while violence and co-option strategies were used towards Saleh's opponents. This "divide and rule" tactics provided little room for institutions in water management and conflict resolution to stabilize. The fall of Saleh's regime is likely partially responsible for the further destabilization of these institutions. Conflict resolution might need to re-invent itself, while at the same time stakeholders' power constellations and access to influential networks have changed. Saleh "structurally" bypassed the process of state building (Hill et al., 2013). Due to the absence of strong state institutions, conflict resolution over water resources management in Yemen is in first place a local governance issue (depending on the scale of the water system). The collapse of the Saleh regime destabilized an already instable governance regime, but at the same time the benefiters of the Saleh regime have still retained power and influence, as they are the better off (wealthier) and continue to have powerful networks (financially and forcefully).

One of the main messages of Hill et al., (2013) is that the interim Government struggles to push political and economic reforms in the face of the resistance of incumbent elite interests. Political decisions (over water resources management) are made by local (tribal) leaders. A small elite (about 10 key families), with close ties to the (former) president, forms Yemen's political economy. This elite structure has remained mostly intact, thus ensuring that a status quo in the division of power between the powerful and wealthy elite and the powerless poor. The poor and women do not actively participate in decision-making processes, which further contributes to inequalities in water resources allocation. Combined with increasing levels of unemployment and poverty among large urban populations this bears the potential for conflict (Hübschen, 2011).

5.4 Stakeholder analysis in water conflicts

Conflicts over water resources management in Yemen are highly contextual. The south of Yemen is socio-culturally, economically, geographically, climatically very different from the north. The enormous variety of socio-cultural institutions framing local norms and values and driving local behavior results in a wide variety of conflict settlement arrangements. To analyze these processes and the roles of the stakeholders it is, therefore, necessary to focus on the specific characteristics of the stakeholders in the specific context.

What also is very important here, in relation to the stakeholder analysis of table 5.1, is that because of the limited capacity of the national institutions, the real implementing power of supplying or protecting water resources is at the local users, at field level (Hübschen, 2011). Numerous causes prevent people to access the legal system for conflict settlement. Resolving water conflicts thus mostly happens at this level, between the local water users, and often based on traditional mechanisms outside the courtroom (Hübschen, 2011). Furthermore, the public and the private are in practice very much intertwined. Sheiks hold public office while at the same act as private agents (e.g., drillers and irrigators). This mix between public and private roles can create conflicts of interests, provide private agents access to public resources, can contribute to increasing inequitable distribution of assets, and decision-making over water resources management (Hübschen, 2011).

To simplify a conflict setting we can assume that in most cases there is a conflict between two coalitions (which can be a single person or a heterogeneous group of people with shared or complementary goals and perceptions); an accusing coalition and an accused coalition[13] (see figure 5.2). The first accuses the latter of intruding on its right to a water resource (in terms of quantity and/or quality). Both coalitions have certain interests and goals, perceptions of the problem, and resources and power (or powerful friends) to steer the conflict process. In this perspective it is important that the context of the conflict (institutions, legislation, property rights, socio-economic and political context) is important in how far it influences the characteristics (motivations, perceptions, resources and power) of the coalitions.

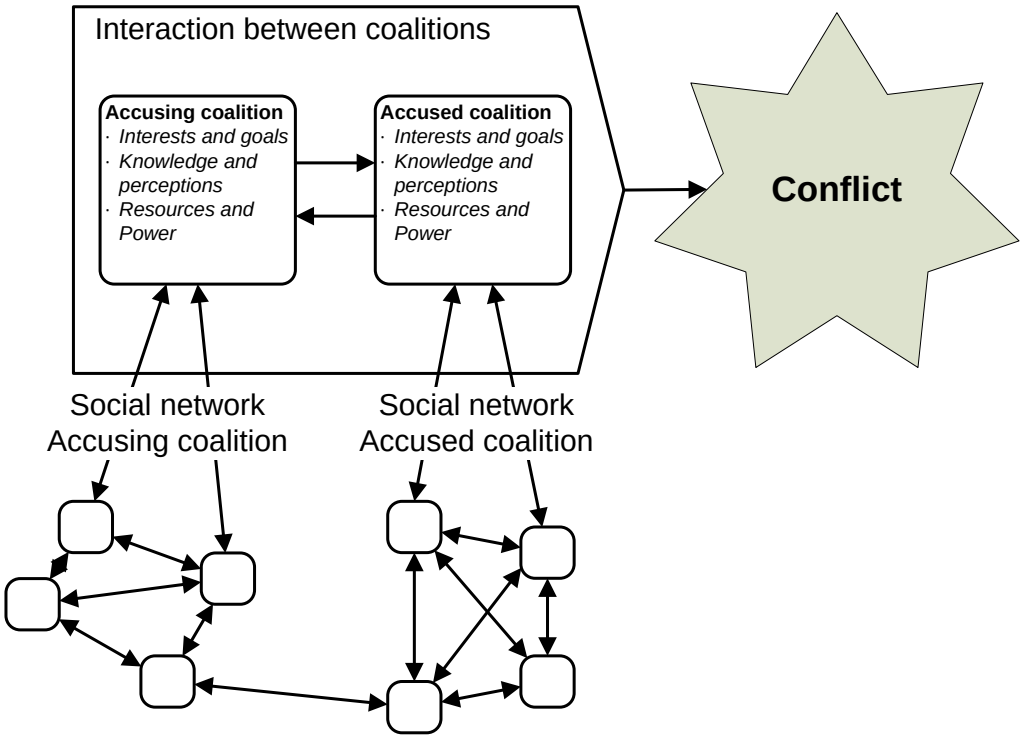


Figure 5.2: Interaction between accusing and accused stakeholder resulting in conflict (based on Evers, 2011)

Many conflicts will be resolved through negotiation between the two stakeholder coalitions. It is also possible that the conflict is "settled" by one coalition overpowering the other (by any means), resulting in a new equilibrium between the two parties and the biophysical water system. If one does not overpower the other (with whatever means) and both parties are unable to settle the conflict between them, the conflict will remain. If this is an unacceptable situation for both coalitions, a third party may be invited to support in settling the conflict. This can be in mediating, arbitrating or judging the conflict. Important here is that this third party is perceived as legitimate (and the institutions it represents, tribal, religious, state, or a mix) by both parties to support in settling the conflict and that the outcome of the process is also perceived as legitimate and lived-up to. Of course, the third party can have a personal interest in settling the conflict.

[13] This is based on the same principles described in the interaction between implementer and target group in the Contextual Interaction Theory (Bressers, 2004) as used by Evers (2011).

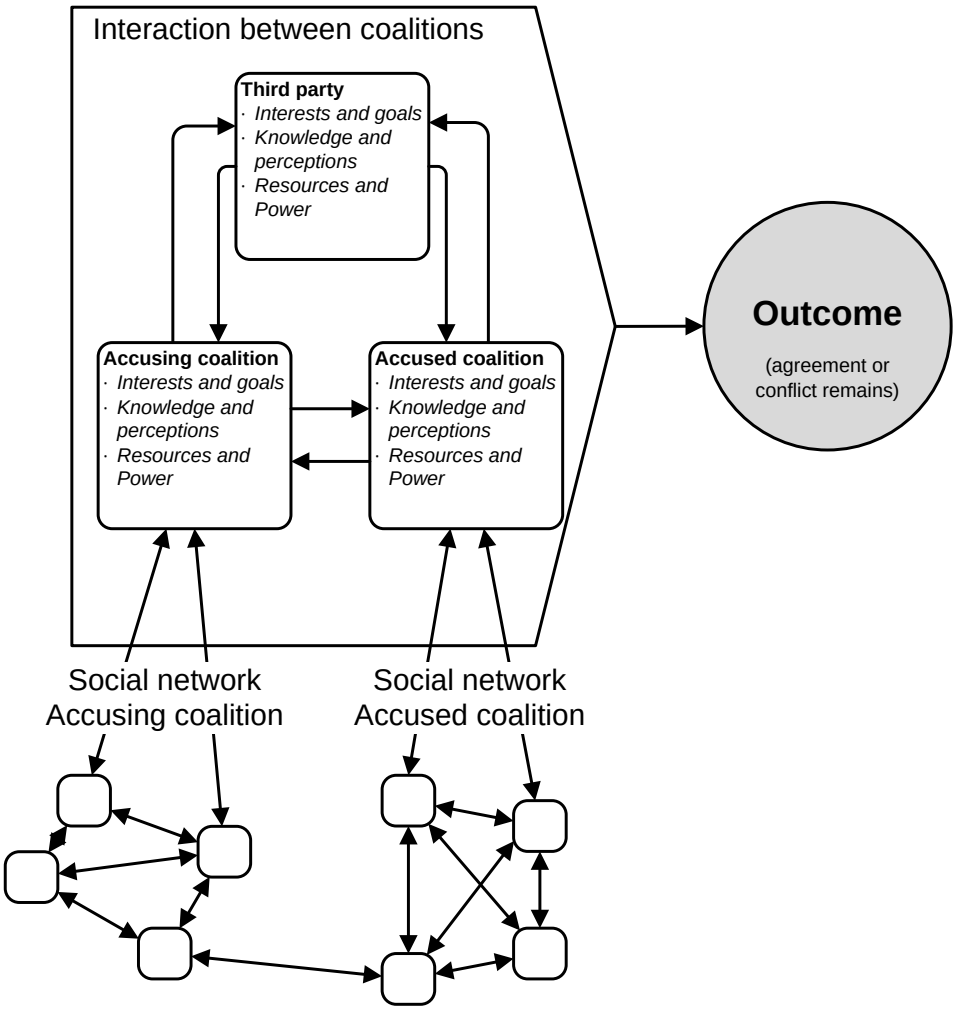


Figure 5.3: Interaction between accusing and accused stakeholder including a third party for conflict settlement resulting in a certain outcome (based on Evers, 2011)

In some cases, the State might as a third party, when conflict settlement for instance is sought via the judicial system. The state can also provide information and knowledge on the water resources characteristics to influence the perceptions of the coalitions in the conflict. More likely is that the state plays a minimal role in the context of the conflict. However, state representatives, like powerful officials, parliamentarians, and the like, can on a personal and network authority play an influential role in the conflict (settlement). The whole state institutional arrangement is merely setting the context in which the conflict developed and is settled, and it does so in interaction with customary and religious institutional arrangements. From this context, stakeholders with their interest and influence can try to steer the outcome from the conflict settlement process.

In summary, stakeholders (coalitions) can be categorized into the following groups:

- Accusing coalition
- Accused coalition
- Third party to settle the conflict (mediator, arbitrator, judge, prosecutor, knowledge expert, witness)
- Direct network actors (which can provide one of the main conflict stakeholders with overthrowing power, knowledge, or take up the third party role to help settling the conflict); and
- Indirect contextual network stakeholders (typically state organizations)

Their interests and goals, perceptions and knowledge, and resources and power in steering the conflict, characterize all these stakeholders. Having access to powerful network partners is in this case can be regarded as a power resource. But what is important here is that both formal and informal institutions only act in as far they are recognized as legitimate by and influencing the behavior of the coalitions in conflict.

5.5 Conclusions

This chapter opened with several questions. The stakeholder analysis shows that there is a wide variety of public and private actors involved in water governance and thus in water conflicts in Yemen. The list of actors shown in table 5.1 is unlikely to be comprehensive and at the local level varieties can exist in levels of power and interest (e.g., the NWRA can have much influence in Sana'a, but very limited in rural settings). The actors as presented in this chapter are not representative of homogenous groups, but house a great variety within. It does show, and the heterogeneity, the complexity of water governance in Yemen.

The capacity of the Government to implement water plans and policies is limited. True influence in developing the water systems rests with the large private irrigation farmers, who control the lion's share of the available water resources. The relation between the private and the public is very complex, as many private agents hold at the same time also public offices. This complexity is enlarged by the pluriformity of regulatory and legal institutions (state, tribal, customary, and religious).

As wealth is important in influencing the development of water resources, the poor (and women) are unequally affected by developments in the water resources system.

The main stakeholders in water conflicts are the local water users. In these conflicts we can recognize an accusing and an accused party (or coalition). Both these parties have an interest in resolving the conflict, but both of them have different perceptions, goals, interests, resources and power to steer the outcome of the conflict process. This can result in a situation in which both parties are unable to settle the conflict. At this stage, a third party can be invited to intervene in order to settle the conflict. Due to the pluriformity of the legal institutions, this third party can be a representative of the state (e.g., a court, judge, etc.), tribal and customary institutions (e.g., sheik, elderman, etc.), or religious leader. Important is that the authority (and the institution it is representing) of the third party is perceived as legitimate by both parties in order to settle the conflict.

With the collapse of the Saleh regime, political and power structures have changed in Yemen. However, the political economy has mostly remained among the same elite families. At the same time, an ongoing process of decentralizing national institutions is underway. The real power, however, of managing and transforming water management in Yemen is in the hands of the private irrigation farmers, who manage the great majority of Yemen's water resources. All in all stakeholder constellations and their power relations in Yemen water conflicts are highly dynamic.

5.6 References

Bressers, H. T. A. 2004. *Implementing sustainable development; how to know what works, where, when and how.* In: W. M. Lafferty (Ed.). Governance for Sustainable Development: The Challenge of Adapting Form to Function. pp. 248-318. Northhampton, MA: Edward Elgar.

Evers, J.G. 2011. *Werk in uitvoering: De toepassing van Interactieve Uitvoering in de praktijk*. University of Twente.

Hill, G., Salisbury, P., Northedge, L., Kinninmont, J. 2013. *Yemen Corruption, Capital Flight and Global Drivers of Conflict*. A Chatham House Report. London: The Royal Institute of International Affairs.

Hübschen, K. 2011. *Integrated water resources management as a governance challenge for countries of the Middle East with special focus on Yemen, Jordan and Syria*. Berlin: Logos Verlag Berlin GmbH.

Ramirez, R. 1999. Stakeholder analysis and conflict management. In: D. Buckles (Ed.). Cultivating peace: conflict and collaboration in natural resource management. pp. 101-126. Ottawa: International Development Research Centre.

Riaz, K. 2002. "Tackling the issue of rural–urban water transfers in the Ta'izz region, Yemen.", *Natural Resources Forum,* 26(2): 89-100.

Salmoni, B. A., Loidolt, B., & Wells, M. 2010. Regime and Periphery in Northern Yemen: The Huthi Phenomenon. Santa Monica, CA: Rand Corporation.

Ward, C., Beddies, S., Hariri, K. Yaffiei, S.O. Sahooly, A. Gerhager, B. 2007. *Yemen's Water Sector Reform Program - A Poverty and Social Impact Analysis*. Washington, Republic of Yemen, GTZ, World Bank.

Zeitoun, M. 2009. The political Economy of Water Demand management in Yemen and Jordan: A synthesis of findings. Water Demand Management Research Series 5, WaDImena, International Development Research Center (IDRC). Ottawa: IDRC-CRDI Canada.

Zeitoun, M., Allan, T., Al Aulaqi, N., Jabarin, A., & Laamrani, H. 2012. "Water demand management in Yemen and Jordan: addressing power and interests." *The Geographical Journal*, 178(1), 54-66.

Chapter 6. Legal and regulatory framework of Water Law

Key message:

After a short section introducing the legislative system in Yemen, this chapter looks at the provisions that might legitimise a right to water in the Constitution and other laws and treaties. From the analysis of the provisions contained in these texts, it emerges that, despite the absence of an official recognition of a right to water, the recognition of contingent rights can provide a framework for it. What is still missing in the current legislation is any measure to ensure the enforcement and protection of these rights, by proper conflict resolution mechanisms, which may result in an increase of conflicts.

6.1 Introduction[14]

Yemen knows a fragmented institutional structure and has conflicting provisions within the legal and regulatory framework, as the framework comprises different legal sources. It is advised to develop this current framework of the water sector in Yemen in such a manner that it will facilitate coherent water management. This is the first step in dealing with the resolution of water conflicts in Yemen. So our assumption is to the reform rather than wholesale replacement by something new, because attempts have already been made to adopt new legislation. The Water Law is part of such new legislation. However this law, as will be discussed and illustrated by the case studies is not used as the sole authority in water legislation and the water sector.

As described in the previous chapters, Yemen historically knows a fragmented institutional structure. Yemen attempted to amend this during the last few decades by adopting specific national water laws such as the Water Law No. 33 of 2002 (further Water Law), and establishing a regulatory body for the purpose of dealing solely with water regulation, the National Water Resource Authority (referred to as NWRA or Authority).[15] Even though the Water Law provides important legislation concerning water governance, important provisions are also contained in the Constitution, Civil Code, Islamic Law (Shari'ah) and Customary Law (Urf).

In the following sections the major legal instruments that define the legislative and institutional framework of Yemen for water resource management will be discussed. These sections are intended to provide an overview and bring to the forefront the constraints and ambiguities concerning water rights. Discussing these sources of law will contribute to understanding the complexity of this country's water resource management, as all of these sources are considered legitimate and are applied to the same resource, i.e., water.[16] Reviewing the

[14] From the perspective of legal research this study combined classic legal methods and social science methods. The classic legal methods entailed 'the classic technique of legal methodology' namely analyzing the conventional sources of law such as legislation, general principles, case law and doctrine through desk research. On the basis of this analysis preliminary conclusions have been made on the functioning of the legal framework of Yemen. The case studies have then been used as a manner to investigate and possibly substantiate the preliminary conclusions of this legal analysis. In the case of Yemen, the legal analysis included the reviewing of the Water Law, Civil Code, Constitution and traditional customs and rules.

[15] According to Republic Decree No. 154 of 1995 the NWRA was intended as the sole regulatory body.

[16] For instance the Water Law is considered legitimate as it is adopted by the government. It is applied and enforced by the National Water Resource Authority. However the traditional rights are also considered legitimate

legal sources will not only facilitate understanding but also assist in developing the recommendations prepared under this study.

6.2 Sources of law

Water rules in Yemen are based on five major legal sources:

1. Islamic Law (Shari'ah);
2. Customary Law ('urf);
3. The Constitution;
4. The Water Law[17] and
5. The Civil Code.

These sources will be examined in this chapter as well as their possible contradictions and ambiguities.

6.2.1 Shari'ah

The national legal system of Yemen knows a certain hierarchy. Shari'ah is the primary source of law and all other laws are seen as subordinate to it. The Constitution states that 'Islamic Shari'ah is the source of all legislation.'[18] Therefore, in principle no legislation developed in Yemen should be contrary to Shari'ah law. Nevertheless, such contradictions can be found in the legislation concerning water, as will be discussed in this section.

6.2.2 Customary Law ('urf)

Over time, communities in Yemen have developed rules for water management which are referred to as customary law or Urf (short for Urf qabalî).[19] Customary law concerns those rules that are mostly unwritten and have developed through traditions and customs of tribes in Yemen.[20] These rules are known, followed and enforced by the communities located in rural and urban areas.[21] Archeological evidence has even proved that certain rules used today for spate water management date back as far as the pre-Islamic period.[22] Even though some rules stem from the pre-islamic period, the customary rules are generally consistent with Shari'ah.[23] Religious authorities are also important in determining and setting rules in relation to water management. The customary laws can differ between regions as local circumstances frame the rules necessary for the area or region. Circumstances such as climate, soil, water availability and also prevailing Islamic Schools shape local customs. [24]

[17] With Water Law, the National Water Law adopted in 2002 is meant. When referring to water law in general no captitals will be used.

[18] Article 3
[19] (Al-zwaini, 2012) p. 15
[20] On the tribal system in Yemen see
[21] (Al-zwaini, 2012) p. 51
[22] (Ward, 2009) p. 268
[23] (Sana'a University & Meta Meta Research, 2012) p. 6
[24] (Bahamish, 2004) p. 23

6.2.3 Constitution

The Constitution was adopted by referendum in 1991 and was last amended in 2001.[25] Constitutions are often considered the highest source of law within a state. The Yemen Constitution establishes Shari'ah as the highest source of law. The Constitution does not mention water often, but it does frame relevant concepts to water, such as ownership. Secondly, the Constitution provides the basis for the adoption of national laws concerning water management.[26]

6.2.4 Water Law

The Water Law No. (33) was issued in August 2002 after a long process of drafting, discussion and amending.[27] This law can be seen as Yemen's first attempt at drafting legislation for Integrated Water Resource Management (IWRM). After the adoption of this law, more legislation on this topic soon followed. Due to the long process and the weighing of stakeholder interests while drafting, certain topics were left open or were not satisfactorily covered. A number of regulations such as Republican Decrees, Resolutions and the Ministry of Water and Environment's Decree were issued subsequently to support and enforce the Water Law.[28]

6.2.5 Civil Code

The first Civil Code of Yemen was adopted in 1992 It made strong reference to Shari'ah when it stated: 'If no text in this law is applicable, reference shall be made to the principles of the Islamic Shari`ah on which this Law is founded, failing which the judge shall decide in accordance with custom (`urf') that is consistent with Islamic Shari`ah, failing which [the judge shall decide] in accordance with the principles of justice conform to the sources of Islamic Shari`ah in their totality.'[29]

The current Civil Code No. (14) of 2002 is the primary foundation for private laws in Yemen and can be seen as the modern day expression of Shari'ah principles (ahkâm). This current Civil Code comprises of 1393 articles dealing with issues such as contracts, ownership, conflicts of laws, and concepts of ownership that apply to water and issues of land. General principles of Shari'ah have been codified in the Code. Accordingly, it is mostly in line with Shari'ah.

6.3 Water in Yemen's legislative framework

Water rights, and as a result water management are shaped by the above-mentioned sources of law. Nevertheless, these sources are different and include conflicting provisions in defining water rights and shaping water management. The viewpoint of each source will be discussed in the following section. Each legal source includes a number of provisions on water rights that have been divided into different categories[30]:

- *Water ownership*, which deals with the legal status of water and the conditions for water ownership;
- *Water diversion and usufruct rights,* concerns the acquisition of diversion and usufruct rights, selling and transferring of these rights and the conditions for losing these rights;

[25] (Al-Zwaini, 2012) p. 38
[26] (Bahamish, 2004) p. 23
[27] (Richards, 2002) p. 1
[28] See Annexes
[29] Article 1 Civil Code no. (1) as stated in (Al-zwaini, 2012) p. 41
[30] The categories used to differentiates between aspects of water rights at national level stem from (Bahamish, 2004) p.9

- *Water use rights and sharing water,* covers priority of use, quantity of use, places of used and sharing and burden-sharing among users;
- *Water administration* deals with water allocation mechanisms, operation and maintenance, organization of users, quantity and quality protection provisions, conflict settlement procedures and enforcement procedures.

6.4 Water ownership

There are two elements that determine water ownership concerning the different sources within Yemen's water resource management, namely: the legal status of water and the conditions for establishing such ownership.

6.4.1 Legal status of water ownership

According to Shari'ah, in principle water belongs to nobody, *Mubah.*[31] Therefore, everyone has the right to free access to water, both individuals and communities. Water may only be owned when it is contained in a receptacle and separated from the source. Such is the case when water is contained in a well or cistern.[32] Shari'ah for this reason does allow private ownership of water under these circumstances. As it is privately owned under these circumstances it may also be sold.[33]

Civil law, takes a similar approach to water ownership as Shari'ah. According to Article 1359 water is originally res nullius: of nobody and for all. Just like in Shari'ah, water may be appropriated and contained in wells, pipes etc. Containing water in receptacles is an appropriate means to sell and trade water.

Contrary to Shari'ah and the Civil Code, the Constitution defines the legal status of water as property of the State, which oversees its utilization and exploitation in order to serve the common good. Article 8 makes this clear as it states: 'All types of natural resources and sources of energy, whether above ground, underground, in territorial waters, on the continental shelf or the exclusive economic zone are owned by the State, which assure their exploitation for the common good of the people.'[34] This definition of water ownership contradicts the definitions given in Shari'ah and the Civil Code. The Constitution defines water resources as State property the use of which is regulated and organized by the State in such a manner that it serves public interest and whereas the Code and Shari'ah regard water as belonging to nobody in principle. However it becomes susceptible to private ownership when appropriated.

The Water Law seems to follow the interpretation of water ownership given in the Constitution namely, water as public property subject to administration by the State. However the Water Law also takes into account principles mentioned in Civil Code and Shari'ah. Article 4 explains that: '[t]he water is in principle permissible for all and does not possess a private ownership except by means of conveyance or acquisition or within their rule and it is the optimum to be secured by what is similar to it.' Moreover, Article 5 explains that: '[t]he streams of the valleys are considered the common property of all the beneficiaries, and all the water installations and wells which are erected by the State are considered public property, and notwithstanding their ownership, they are subject to the system of registration and licensing in accordance with the provisions of this Law.' This definition of water as public property is then followed in Article 6 which stipulates that:

[31] (Naff, 2009) p. 48
[32] (Ward, 2009) p. 240
[33] (Bruns & Taher, 2009) p. 15
[34] Article 8 Constitution

'[e]ach beneficiary of any of the water resources enjoys the right of utilization with a view not to harm these resources or the interests of the others, (…). The State intervenes to regulate the rights and duties of utilizing the water in accordance with the provisions of this Law and the bylaws and rules that execute its provisions.' These provisions show that, on the one hand, water is in principle owned by nobody as is in line with Shari'ah, whilst, on the other, water rights are subject to rules formulated by the State as is in line with the Constitution.

6.4.2 Conditions of water ownership

Shari'ah recognizes four types of water sources in relation to water ownership: (a) water enclosed in manufactured receptacles, (b) water in wells, cisterns and springs, (c) water in small rivers or streams belonging to specific communities, and (d) water in great rivers. Unless water is taken and placed in privately owned containers as explained above water cannot be privately owned. In the other categories, water is owned either by nobody, or by all and the community as a whole.

The Civil Code reflects this by stating that water is not owned as a private property, except when transported or contained in receptacles. Drilled wells are considered an appropriation of containment (and hence ownership), provided that the water from the well is a *res nullius* and it passed in the (natural) waterway.[35]

Private ownership is not endorsed by the Constitution. As the Constitution determines that all natural resources are state property, ongoing exploitation and utilization of water resources is subject to concession, regulations and permissions by the State.[36] Following on from the Constitution, the Water Law determines that individuals and entities may only acquire rights of usage based on the provisions of the Water Law and permits given. The Water Law also recognizes traditional rights to water use. Article 29 explains that: '[t]he traditional usufructs and the rights associated therewith, prior to the issuance of this Law, in the water of springs, valleys, natural streams and wells shall remain reserved without prejudice to the registration principles provided that they shall remain assigned for the purposes specified thereto and in case of their transfer to another owner, such rights shall necessarily be transferred to the new owner and in case of the division of the land which is making use of water, the water shall be distributed as per the areas of the plots resulting from such division.' This shows that the ownership according to the Water Law can be based on permits given by the Authority but also on the basis of traditional rights. The Water Law includes a number of provisions and regulations to determine the requirements. Therefore, with the adoption of the Water Law attempts were made to build a bridge between state legislation and traditionational rights by trying to make traditional rights susceptible to state regulation.

6.5 Water diversion and usufruct rights

A distinction is to be made between water diversion rights and usufruct rights. Diversion rights are traditional rights that are held by individuals, families, tribes or other collectives and acquired through centuries of water utilization for agricultural purposes.[37] Usufruct rights, on the other hand, are established through a permit system with a concession specifying its utilization and development purposes that is provided by the State.[38]

[35] Article 1336 of the old Civil Code
[36] Article 8
[37] Article 2 under 18
[38] Article 2 under 17

The following section discusses the basis and conditions for acquiring diversion and usufruct rights in the different legal sources. It lays out the following elements: (1) the acquisition of the rights, (2) the sale and transfer of the rights, (3) the protection of the rights, and (4) the conditions for losing the rights.

6.5.1 Acquisition of diversion and usufruct rights

As explained, traditional rights only comprise of diversion rights, which are held by individuals or communities. The use of water by these rights holders has been uninterrupted and uncontested by others.[39] Often, these diversion rights are seen as servitudes to the land that is owned by the holders of the rights. Diversion rights are well established, recognized and enforced in Yemen and exist for surface water, springs and gravity wells.[40] The management of run-off surface water is subject to traditional rules and regulation that also apply to well-water management. One well-known custom is that of: 'al 'ala fa al' ala, where the upstream riparian has a priority right to irrigate his land by using surface spate water.[41] The downstream riparian may in turn not be denied any surplus water after the upstream riparian has used a sufficient amount of water. These interrelated rules are adhered to in many parts of Yemen and related penalties have been developed over time.[42]

The Civil Code observes the acquisition rules of Shari'ah. Article 1360 states that *res nullius* water can be rightfully used by whomever it reaches first, in a quantity that suffices him even if this means that this is taken from the property of others. It is nevertheless prohibited to enter another person's property to take water without their consent unless allowed so by custom. Moreover, if water is acquired from someone else's property, it should not harm their property. From this provision a number of requirements and rules can be deducted. Firstly, non-appropriated water may be claimed for appropriation even when it is taken from the property of others. Secondly, claims are recognized on a first come, first served basis (seniority). Thirdly, the claim to water covers an amount based on the sufficiency to the appropriator.[43] Fourthly, in principle you may not enter someone's land to take water without permission or consent unless it is based on custom. Finally, those who take water from land owned by others are prohibited from causing harm unless the water is used for drinking or religious purposes.[44]

The Civil Code does not distinguish between surface and groundwater. It could, therefore, be said that it applies to any water source. Article 1366 does state that obtaining diversion and usufructs rights concerning groundwater can be done by buying land and drilling wells. According to Article 1163, the owner of the land has full control over exploitation and development of the resources located above and beneath its land at height and depth which are essential for useful enjoyment of the land.

The Constitution, as discussed before takes a different approach. Surface and groundwater are owned by the State, as are all natural resources. The state sees to the appropriate exploitation of these resources. Moreover, the state has the exclusive authority to grant concessions related to the exploitation and development of the resources. The national laws, including the Water Law include the provisions that define the requirements of these concessions. Therefore, the Constitution provides the basis for developing particular laws and regulations concerning concessions. The Water Law can be seen as an expression of this.

[39] (Bahamish, 2004) p. 9
[40] (Bahamish, 2004) p. 10
[41] (Bonzanigo & Borgia, 2009) p. 29
[42] See (Bahamish, 2004) for application of the principle 'al 'ala fa al' ala in Wadi Zabid. Traditional rights are enforced by the community. Often traditional tribal leaders such as sheikhs but also clergymen have the authority to rule when conflicts occur.
[43] Article 1364
[44] Article 1365

The Water Law seems to be an articulation of the concept of concession and regulation by the State used in the Constitution. The Water Law recognizes traditional diversion rights and usufruct rights as mentioned above in Article 29. The Water Law recognizes the traditional usufruct and diversion rights, provided that the water is used for irrigation in connection with agricultural land.[45] From these provisions it can be concluded that for all existing diversion and usufruct rights, which do no stem from custom,[46] registration with NWRA is required.

6.5.2 Selling and transferring of diversion and usufruct rights

Shari'ah employs two lines of thought when it comes to the transfer of diversion and usufruct rights. The first line of reasoning regards water rights as connected to the land. Therefore, water rights are inseparable from the land and transfers automatically with the land through sale or inheritance. The second line of reasoning argues that water rights and land can be separated and that transfer of water rights should be expressly stipulated when land is sold. If this is not done, the water rights remain with the previous landowner.

The Civil Code also allowed for the ownership of land and the ownership of what is above and beneath to be separated through agreement, as long as it does not contradict other legal provisions. The Civil Code does define irrigation rights as servitude to the land, making this right inheritable and transferable by selling land. Article 1363 makes this explicit by stating: 'the right to use water for irrigation is an appurtenance to the land, so that it is inheritable but it cannot be sold separately from the land, neither may it be rented or donated, except in accordance with a recognized custom.' For this reason all water rights, besides irrigation rights, are transferable and use can be separated from the land.

As mentioned, the Water Law allows traditional water diversion rights except water rights for irrigation purposes, obtained before the entry into force of the Water Law, to continue without application of the law.[47] These rights are also servitudes of the land, which means that according to the Law they are compulsorily transferred with the land.[48] The Water Law does impose the condition that the purposes and amount of water use for irrigation may not be changed in order to be preserved and the rights are subject to registration with the State. All other diversion and usufruct rights to, for instance groundwater, whether obtained prior to or after the issuance of the Water Law are subject to licensing and regulation by the State. The terms and conditions of these rights are specified and assigned by the relevant Authority as explained in article 37: '[n]o beneficiary may exceed the quantities or surpass the purposes of use or any other technical specifications identified by the Authority. The beneficiaries should strictly observe the conditions in the license. The bylaws provide the necessary details for implementing these conditions.'[49]

As the Water Law implicitly recognizes that water is owned by the State as stated in the Constitution and that usufruct rights are administered by the State, usufruct rights can only be obtained by individuals and entities based on the provision of the Law. Accordingly, it can be assumed that usufruct rights cannot be sold or transferred without regulation and monitoring by the Authority. However, the Law does not include clear provisions regulating selling of and transferring of water rights.

[45] Article 28
[46] Those which are based on the Water Law.
[47] Article 29
[48] Article 29
[49] Amended in Water Law No. (41) of 2006 Amending some articles of law No. 33 for the year 2002 Concerning water

6.5.3 Conditions for losing the diversion right and usufruct

According to Shari'ah, following the line of reasoning where water diversion rights and usufruct are connected to the land, these rights cannot be lost. Nevertheless, the use of these rights may cease in certain situations. Firstly, this occurs if land is washed away or covered by a layer of sediment. Secondly, if the intake structure is extremely damaged or even washed away. Thirdly, the beneficiary may also abandon the use and fourthly the source used for the right may be depleted.

The Water Law provides that licenses are given to exploit water resources. Rights can be canceled by operation of law. Article 38 stipulates that: '[l]icenses granted in accordance with this Law for drilling water wells shall be considered canceled by the force of the Law in the following events:
1- If the licensee fails to commence drilling works within one year as of date of issue of the license.
2-If licensee uses the license for purposes other than those for which the license was issued.
3-If licensee violates the conditions of the license.
4-If licensee assigns the license to others with or without price without the consent of the Authority. The bylaw specifies the cases in which such assignment could be accepted. The Authority shall have the right of regular review of these licenses in accordance with the system prepared for this purpose. Based on justifiable reasons, the license may be renewed once for a period of 3 months, which may be extended in the event of persistence of such reasons.'

Besides the provision in Article 38, other provisions also impose conditions for losing diversion and usufruct rights. Article 40, for instance, states that: 'the Authority may cease the right of utilization if it is evident that the water of the well or the water installation is polluted, thus harmful to public health and the environment, and the impossibility of treating that in accordance with a laboratory report by the competent authority.' Chapter 8 of the Water Law on enforcement procedures sets out the powers of the Authority to intervene in certain circumstances.

6.6 Water use rights and sharing water

The following sections discusses the regulations that are imposed on the water diversion and usufruct rights. Four elements can be distinguished: (1) Priority of use, (2) Quantity of use, (3) Places of use and sharing and (4) Burden-sharing among users.

6.6.1 Priority of use

Shari'ah gives first priority to water for drinking and domestic purposes. Within this priority a hierarchy is present starting with water for human drinking, followed by water for animal drinking and water for domestic purposes.[50] Denying to share water according to this hierarchy is often regarded as a sin or haram. After the priority for drinking and domestic purposes, priority is subsequently given to water for irrigation ourposes.

The Water Law gives absolute priority to drinking water and domestic use in Article 20, and Article 21 formulates the hierarchy among the other uses. 'Without prejudice to Article (20), water shall be allocated for the following purposes :-

1. Supply the animals with water.
2. Use for public utilities.

[50] (Naff, 2009) p. 44-45.

3. Irrigation purposes.
4. Industrial purposes.
5. The minimum environmental requirements.

6.6.2 Quantity of use

Shari'ah considers water to be a gift from God. Wasting water is a sin or haram, whereas rationing water is considered a virtue. For this reason the community is allowed to intervene in the case of wasteful water use.[51] For irrigation purposes the quantity of water permitted is set at a layer of water whose depth is about the height of a man's ankle.
The Civil Code again reflects Shari'ah and customs in relation to allocation. Article 1363 states that: 'sufficiency is to be determined on the basis of water use when the land was first reclaimed or, if this use rate in unknown, on the basis of use when the land began to be irrigated. In spate irrigation, the quantitative measure of the right of the upstream user is customarily established at the height of man's ankle.' Therefore, the Civil Code explains the obligation that the senior user must obtain sufficient water based on either the amount of water that was sufficient when the land was first claimed and if this is not know it should be estimated according to the needs when irrigated.[52] And that senior rights holders have an obligation against persons who are located in the same watershed namely: 'a riparian cannot be denied his right, which is the surplus water after the senior user gets sufficient water.'[53]

As explained before, the Water Law specifies that traditional rights are subject to registration with the Authority. These rights are preserved as far as the use is in line with the purpose and the quantity of use does not change. For the other rights, the amount of water use and the purposes are specified in the license and regulated in Article 37, where it says that: 'no beneficiary may exceed the quantities or the purposes of use or nay other technical specifications and determined by the Authority. He must also abide by the conditions specified in the license, and the bylaw shows the detail necessary for execution accordingly.'

6.6.3 Places of use and sharing

It is of significance to determine whether water can be used whenever and wherever by the rights holder. This issue will shed light on whether water can be relocated.

As a consequence of Shari'ah regarding water as a servitude to the land, an individual cannot take water to other land if his action causes harm. This viewpoint is supported by Article 1372 of the Civil Code: 'a person is not allowed to draw water to irrigate land which has no right if such drawing harms those who have a water right.' Therefore, surface water in principle has to be used to irrigate the land where it is located and may not be relocated.

Article 50 of the Water Law stipulates the requirements for transferring water from one wadi to another:

1. 'That the process of conveyance does not lead to damages in the requirements of drinking and household uses, whereby there is no future negative effect on the quantity and quality of the water in the zone or the basin from which it was conveyed.

[51] (Lichtenthaeler, 2003) p. 208.
[52] (Varisco, 1983) p. 369.
[53] Article 1371.

2. That the water is conveyed for the purpose of drinking and household uses in the basin receiving the water.
3. That the water stored in the zone or basin to which it is conveyed, is insufficient to meet the requirements due to scarcity of the water or its unsuitability for drinking after suspension of all other uses.
4. Consultation and coordination with the local authorities, basins committees, and actual beneficiaries of the basin from which it is conveyed.
5. If, as a result of conveying the water, damage occurs to existing interests of the beneficiaries (the holders of the right of utilization), such damage shall be compensated according to principles of fairness and for one time.
6. In all the cases, in the event of numerousness of the sources from which they can be conveyed, and the proximity of the economic cost for conveyance from them or from some of them, to the cost of conveyance from one source only, due consideration shall be given to drawing the required quantities of water.'

6.6.4 Burden-sharing among users

Within Shari'ah, if water is owned by an individual, that individual has the right to use it as he wishes. However, if the water is owned by a group, the water must be evenly distributed among them in proportion to their share. Their share can be based on time-shares for pumping. This, however, also means that there are restrictions on the quantity that may be extracted.

The Water Law does set standards regulating the conditions for transfer of water and the amount to be transferred. The Law also stipulates self-management of communities by setting up organizations like the WUG, WUA and WUF. For instance Article 10 states: 'Societies or groups or committees or associations or federations for water beneficiaries and users, may be formed the purpose of which is to involve the community and beneficiaries of water in organizing the water resources or operating and maintaining their installations.'

6.7 Water administration

Regulation concerning water administration can be divided into six elements: (1) Water allocations systems, (2) Operation and maintenance, (3) Organization of users, (4) Quantity and quality protection provisions, (5) Conflict settlement procedures and (6) Enforcement procedures.

6.7.1 Water allocation mechanisms

Water in the informal setting, such as under Shari'ah or customary law, is allocated according to time-shares or by making openings alongside the water channel. What is taken into account with assigning time-shares or deciding on the size of the openings are the contribution each individual or groups has made in the construction, operation and maintenance of the water source and its infrastructure. Normally, the person designated to operate the water source is assigned to hold a record of the entitlements to the water source. However, the allocation mechanisms of times shares and openings do not include limits on the amount of water extracted from the source.

As explained, the Water Law does set limitations on the amount of water extracted and the purposes for which it will be used by the permit system it sets in place. According to Article 37: 'no beneficiary may exceed the amounts or purposes spelled out by the Authority (NWRA) in the permit and must comply with all the terms

spelled out in the license.' The Authority is, therefore, the authority that decides, after sufficient consideration of the possible consequences, how much water is allocated to the different areas. It is then the task of community-based organizations to manage the resources given in an equitable way in line with the requirements of the permit.

6.7.2 Operation and maintenance

Shari'ah includes several provisions on the sharing of operation and maintenance costs of water infrastructure, which are codified in the Civil Code. Article 1367 for instance states that: 'a water channel owner must operate and repair it so as to remove the harm, which may occur to the land in which it passes through. If the channel owner refuses, then the landowner may undertake and pay for the repairs then claim the expenses. The law also regulated issues of compensation to Intermediate Land, the right of the intermediate land to benefit from the passing structures (canals or pipes) provided a share of the cost is paid.'

Also in operation and maintenance the Water Law focuses on community-based participation. Community-based organizations, such as the WUG, have the responsibility to create their own rules and regulations when it concerns operation and maintenance. These are then found lawful when registered with the Authority.

6.7.3 Organization of users

The most elaborate organization systems in Yemen concern those of the surface water sources, such as base flows, spring water or surface reservoirs. For these sources, well-organized water management and decision-making processes exist based in traditions and customs, which stem from Customary Law and Shari'ah. Groundwater resources on the other hand lack such elaborate systems. As mentioned, water access is assigned in proportion to contribution in construction and maintenance, however, there is no restriction protecting from over-exploitation, which in turn encourages competition.

To deal with such circumstances, the Water Law introduces decentralized community participation in the form of the WUA. When registered with the Authority, this organization constitutes the official stakeholder representation in water management.[54] The WUA has several important tasks. Firstly, it self-regulates and enforces groundwater abstraction rights and secondly it implements and manages plans concerning groundwater.[55]

6.7.4 Quantity and quality protection provisions

Several rules from Shari'ah and customary law that deal with quantity and quality protection are formulated in the Civil Code. Firstly, a well-known rule stipulates that when a well is constructed considerable distance must be kept between the well and neighbour's property.[56] The distance required is, however, not specified. Secondly, the owner of a pre-existing water source such as a well or a spring is allowed to declare a protective zone around it for protecting the source and structure.[57] Thirdly, the required distance between 'deep wells' should be 500 meters and for shallow wells there are no customary distance requirements.[58] The rules concerning water quality are, however, very limited.

[54] See (Bruns & Taher, 2009) p. 2-3.
[55] (Bruns & Taher, 2009) p. 25.
[56] Article 1181.
[57] Article 1185.
[58] (Bruns & Taher, 2009) p. 5.

As explained in the abovementioned sections the quantity of water exploited is regulated by a 'registering and licensing system'. In addition, the Authority has the power to protect water resources for pollution and degradation of water quality. If necessary the Authority may implement rules and standards for this purpose.

6.7.5 Conflict settlement procedures

In dealing with water conflicts there are two possible settlement procedures, either via the judiciary or via arbitration. Moreover, there are two types of arbitration systems: legal arbitration[59] and custom or tribal arbitration. In the event of conflict over water, both parties may agree to conflict resolution through legal arbitration.[60] The custom arbitration consists of several levels through which parties can proceed, commencing with arbitration at the village level and ending at the level of the tribe.

For conflict settlements according to Water Law, traditional arbitration can also be used. Parties can bring their case before the village *aqil*.[61] If there is no settlement at this stage, the next step would be to bring the case before the area sheikh or court.

6.7.6 Enforcement procedures

Chapter 8 of the Water Law starting with Article 63 formulates the enforcement procedures and penalties applicable to the provisions of the Water Law. Article 63 states that: '[t]he employees of the Authority and relevant bodies, who are charged with control and inspection, shall be granted the capacity of judicial enforcement, (…).' The santions authorized by the Water Law include fines and imprisonment.[62]

6.8 Conclusions

The analysis illustrates that the legal and institutional framework for the water sector in Yemen shows internal conflict. Values and principles presented in the legal sources are diverging. However with the adoption of the Water Law an attempt has been made towards conversion. Nevertheless, what can be assumed from the review the Water Law, Civil Code, Constitution and traditional customs and rules, is that conflicts will arise when the law is applied and when parties invoke these conflicting legal provisions. A consequence of this internal conflict and the availability of multiple legal sources and institutions to deal with water issues could be that individuals may 'forum shop'. [63] They may look at for instance which institution is likely to provide them with the outcome they prefer and approach this institution.[64] These assumptions are assessed in the case studies, which are presented in the following chapters.

[59] Presidential Decree of the Law No.(22) for the year 1992 on arbitration and Law No.(32) for the year 1997 on the amendments of some articles of the arbitration law.
[60] (Kambeck, 2008) p. 333
[61] (van Steenbergen, Bamaga, & Al-Weshali) p. 175
[62] Article 67 - 71
[63] (Bavinck, Pellegrini, & Mostert, 2014) p. 131
[64] There are also other reasons for preferring a certain institution. For instance the perceived legitimacy of that institution.

6.9 References

Al-zwaini, L. 2012. *Rule of Law Quick Scan Yemen The Rule of Law in Yemen: Prospects and Challenges* (pp. 1–106). The Hague.

Bahamish, A. A. 2004. *Final Report On Legal Survey of Existing Traditional Water Rights in the Spate Irrigation Systems in Wadi Zabid and Wadi Tuban* (pp. 1–59). Retrieved from http://www.spate-irrigation.org/wordpress/wp-content/uploads/2011/06/WaterRightsWadiZabidTubanEnglish.pdf

Bavinck, M., Pellegrini, L., & Mostert, E. 2014. *Conflicts over Natural Resources in the Global South* (pp. 1–226). Taylor and Francis, London.

Bonzanigo, L., & Borgia, C. (2009). *Tracing evolutions of water control in Wadi Siham, Yemen*. Wageningen University.

Bruns, B., & Taher, T. (2009). *Yemen Water User Association Study: Findings and Recommendations for a Problem-Solving Approach* (pp. 1 – 76).

Kambeck, J. (2008). Arbitration in Yemen. *Arab Law Quarterly*, *22*(3), 331–333. doi:10.1163/157302508X343801

Lichtenthaeler, G. (2003). *Political ecology and the role of water* (pp. 1–226). London: Ashgate Publishing Limted.

Naff, T. (2009). Islamic Law and the Politics of Water Introduction : Water , Society and Law. In J. Gupta & J. W. Dellapenna (Eds.), *The Evolution of the Law and Politics of Water* (pp. 37 – 52). Dordrecht: Springer Netherlands.

Richards, T. (2002). *Final Report Assessment of Yemen Water Law* (pp. 1–15).

Sana'a University, & Meta Meta Research. (2012). *CoCooN-Integrated Project Groundwater in the Political Domain* (pp. 1–42).

Taher, T., Bruns, B., Bamaga, O., Al-Weshali, A., & van Steenbergen, F. 2012. Local groundwater governance in Yemen: building on traditions and enabling communities to craft new rules. *Hydrogeology Journal*, 20(6): 1177–1188. doi:10.1007/s10040-012-0863-1

Van Steenbergen, F., Bamaga, O., & Al-Weshali, A., 2011. Groundwater security in Yemen: who is accountable to whom? Law, Environment and Development Journal, 7(2), 164-177.

Varisco, D. M. 1983. Sayl and Ghayl : The Ecology of Water Allocation in Yemen. *Human Ecology*, 11(4): 365–383.

Ward, C. (2009). Water conflict in Yemen: The case for strengthening local resolution mechanisms. In *Water in the Arab World* (pp. 233–255).

Chapter 7. Case studies in Sana'a basin

Key message:

- **The cases investigated in Sana'a are three cases with different causes of conflict. People nowadays choose multiple strategies to resolve their conflicts. When tribal arbitration fails to resolve conflicts, mediation is used. Mediators are more successful than arbiters, but even then "only good and non-partisan mediators are helpful" according to focus group participants from Shahik. They all agree that mediators are more successful in resolving conflicts. Perhaps because mediators are not traditionally as influential as sheikhs and hence were not corrupted or distracted by political parties.**
- **People do not usually go to the court to resolve their conflict, partly because it is expensive but most importantly because it is ineffective. They prefer to resolve their conflicts on their own. "For us tribes, we use no courts when killing happens. We just use Urf (customary law)", said Fahdl Mana'a, sheik Dhaman from Bani Husheish. Proving this ineffectiveness, he talked about more than 320 land dispute cases that people attempted to resolve through courts for more than ten years with no success.**
- **Sometimes a district director and security director can intervene in their own personal capacity to help resolve conflicts if people asked them to. However, it is uncommon and participants could not remember any serious case in which they intervened.**

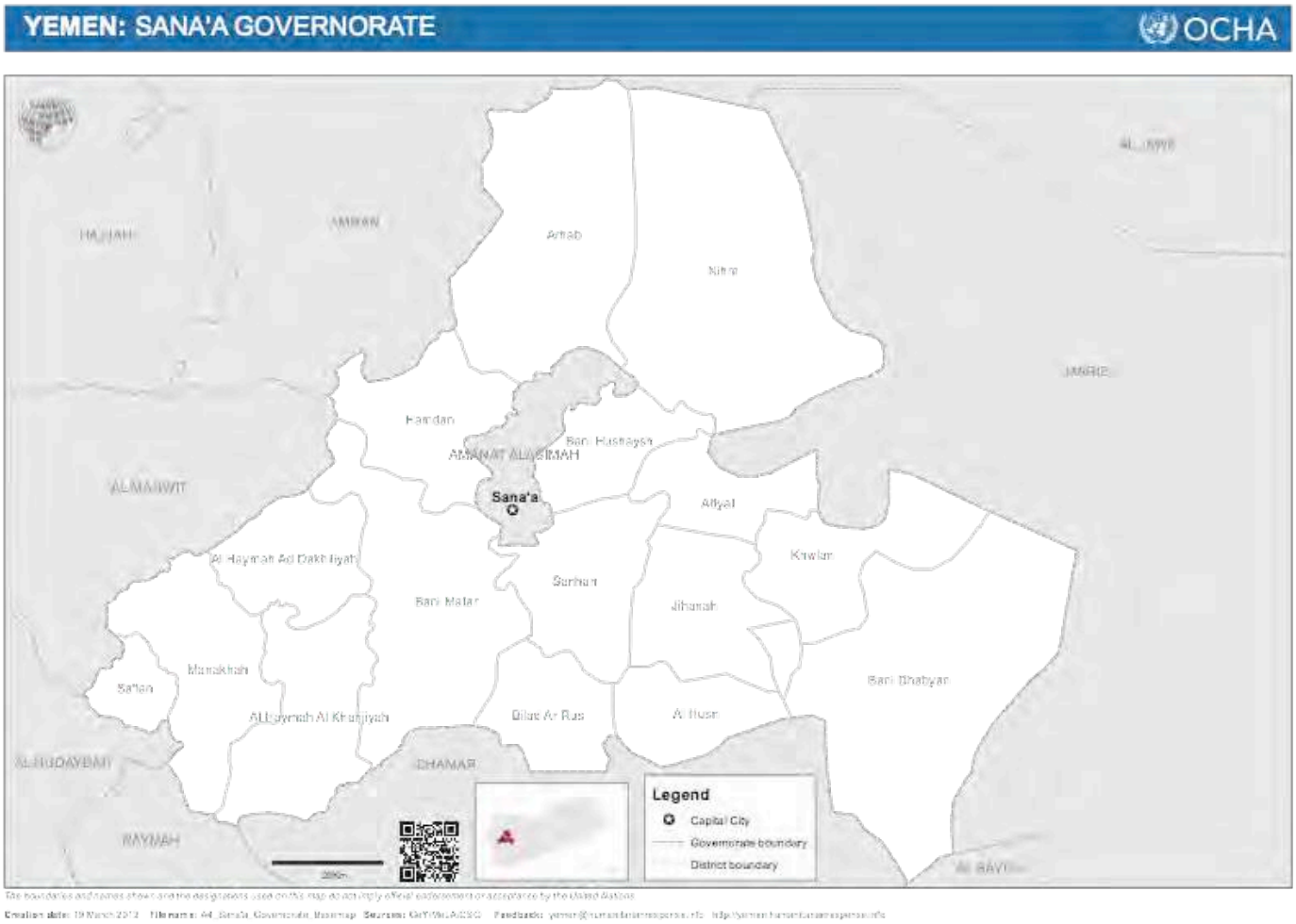


Figure 7.1: Map of Sana'a governorate

7.1 Case 1 - Shahik dam: villagers of Shahik *vs.* villagers of Tan'im

7.1.1 Overview of the conflict

This case is located in Bani Seham greater tribal area, where the Government built a dam in 1985 without any social impact study. Competition over water started in 1998 when a flood filled up the area behind the dam. Eventually, fighting started and some people were killed and others injured. The conflict was resolved and the parties agreed to share the water. However, the Government did not play a role in this agreement.

7.1.2 A: Context and contextual changes

Shahik and Tan'im villages are two villages in the Khawlan area in Sanhan district, 45km southeast of Sana'a. The livelihood of the people of this area depends on the cultivation of grapes and cereals, with small and scattered fields of qat (although the local (cooler) climate is more suitable for grapes than qat plantation). The depth of wells in this area reaches 700-1,000m but there is always a water shortage.
At this depth, well water becomes so hot that it requires cooling before it can be used for human consumption or for irrigation. The shallow wells - with a depth up to 50m - are dry most of the year, collecting only water during the rainy season and flooding.
The rules and agreements they apply for the distribution of the surface water resources are mainly the 'Urf'. With regard to groundwater, the well spacing standard is set to 500-750m. For new wells people have to apply for a permit with the NWRA office. Apart from that the local farmers have no knowledge of the Water Law, neither the role of ministry of water and environment (MWE), nor the national water resources authority (NWRA).
In general, large problems exist, as everywhere in Yemen, with obtaining diesel fuel for the pumps. Electrical pumps cannot be used because as the electricy supply is unreliable. People usually wait at fuel stations for one or two days to get diesel. Whereas the normal diesel price is 10,000 ryals it may increase upto 40,000 ryals on the black market, with the risk that the diesel is diluted with water (and consequently damaging the pump's engines).

Back in 1985, the Government built a dam between the two villages on communal lands in order to control floods and recharge the groundwater. However, the shallow wells remained dry. The area where the dam was built was common land and not owned by either one of the two villages. Tanim village, located downstream of the dam, owned some grape fields and farms in the lake area close to the inner side of the dam wall. It was evident that their fields would be submerged by the lake water and would be lost. The Government compensated them in the construction phase with cash for the lost fields.[65] Shahik village and most of its fields and farms were located at the far tail end of the expected lake. The area covered by the lake water has some historical sites and archaeological features.

The design of the dam caused the lake to extend and reduced the flow of surface water and subsurface water to the downstream village of Tanim. It is attributed by the villagers to the following: (a) The high level of the spillway and with no emergency spillway, and (b) the dam foundation was laid on a solid rock base and filled with concrete core which resulted in the blockage of the base flow, downstream towards Tanim village.

[65] according to shaik AlWashah of Tanim

In 2002 a large flood filled the reservoir lake, consequently submerging agricultural land between the two villages. This caused a loss of income to the landowners. As compensation, the Government first wanted to provide them financial compensation, but one of their Mashaikhs suggested that the Government should give wheat to the landowners of Shahik for some years instead. Accordingly, the Government, through President Saleh,[66] gave the Shahik village people a yearly wheat supply of 3,000 sacks (qada). However this supply ceased in 2007 (or 2006 or 2009, interviewees are not clear about dates[67]).[68]

7.1.3 B: Conflict description and stakeholder analysis

The conflict started in 2002 between the two villages over (a) the use right and (b) the share of each village to the lake water. It is claimed that the dam prevents the flood and base flow from reaching the area of Tanim as it used to be before the dam construction. Therefore, the people from Tanim village started to use pumps to withdraw water from the lake in order to irrigate their fields. Apparently, the people of Shahik warned the people of Tana'am on several occasions. The conflict started and ended with the death of two persons, one from each side.[69]

The Shahik sheikh believes that the conflict was triggered by Tan'im's jealousy that they have not received a similar compensation from Saleh. However, the Tan'im sheikh mentioned that they also received financial compensation from Saleh although said that he could not remember how much.

According to Abdullah Saleh Feleih, the sheikh from Tan'im, the disagreement was over water share and each side claimed that the land in which the dam was build was theirs, despite the fact that, according to tribal traditions, that land was common grazing land.

"What happen later is like a punishment from GOD. The water had been dried gradually until it finished and the dam does not receive any amount of flood water since the bloodshed."

Fighting is, according to the interviewers not very common, and the cases are exceptional to some degree. However, there are no records maintained on these conflicts. A few years later, in 2005, the lake dried up and the area was never filled with water again, which according to one interviewee was "like a punishment from God".

[66] The ex-president Ali Abdullah Salih directly interfered because he had the responsibility to resolve conflicts, especially when there are victims from both parties. If the conflict would continue it would lead to more disturbances in that area.
[67] according to shaik Ali Faker Shahik
[68] In 2007, when Ali Mujawwar was appointed as Prime Minister, he refused to continue give the compensation declaring that the ex-president order is old, and demanded to bring a new one from the president. Apparently, what happenend is that when the former prime minister Dr. Bajamal departed, the staff did not take care of what orders have been issued in the past so the new prime minister requested a new order to get wheat. The Shahik village people couldn't meet and obtain a new decision from the ex- president Saleh, due to his occupation with the security problems in Sada'a city[68]. After they introduce a file explaining our problem through the Ministry of Agriculture, the treatment stopped again because the events (revolution) of 2011.
[69] From Shahik, the victim is Abdul-Wahab AL-Ma'ageli, from Tana'am the victim is Sheikh/ Ali Mohammed AL-Subari.

7.1.4 C: Dispute regulation mechanisms

"The real war is the war of feasts- Alharb harb Almawa'ed" is a local saying indicating how costly it can get to host arbitrators.

Local tribal sheiks from Bani Seham intervened between the two villages. They convinced the parties to stop fighting and to embark upoan arbitration. The conflicting parties choose three sheikhs[70] from Bani Seham to act as arbiters. They initiated the arbitration process by taking *Adal* or guarantees from both sides. In tribal customary law, the purpose of the Adal is to show commitment from conflict and a desire to abide by the verdict of the arbiter(s). The Adal consisted of 65 machine guns and a million Yemeni Rials from each side. Furthermore, the arbiters along with their armed guards became guests, alternating between the two conflict parties. Each host would slaughter a cow and at least 5 goats a day whilst hosting them. In tribal traditions, conflicting parties have to pay hospitality to the arbiters. It is a way to appreciate their help, but also to push the parties to settle the conflict quickly to reduce expenses.

In general, people think that crimes should be solved through the customary rules laid down by the Mashaikhs. Therefore, they do not perceive the need to go to court. There are customary rules, which regulate cases involving mutual killing, although it is difficult. Revenge killing is the only single problem that is very difficult for Urf to resolve. There are no specific rules except blood-money, which is rejected most of the time because it is a big shame for a tribe to take blood money for their murdered member of the tribe from the perpetrator or his tribe. Revenge killing continues even if the original cause of the conflict, e.g., concerning land, is resolved. There are only two rules through which revenge killing issues were resolved in the past: (1) the victims' family forgiving the pretrators tribe; (2) when the number of killed people is equal, which according to the Urf should resolve the conflict. Many tribes take advantage of this rule, but of course it does not happen all the time.

In this case, according to the Sheikh of Shahik, they issued a Fard rather than a verdict. Fard is what the arbitrators say verbally as their assessment and judgment of the situation before it becomes a written verdict. The fact that the both parties lost the same number of people was considered a solution in and of itself. However, the artbitrators said that the victim from Shahek was killed in an accident unrelated to the actual conflict. In other words, the arbitrators recognized only one killed from both sides. Shahik rejected the Fard because it acknowledged only the killed person from Tan'im's side.

Arbiters do not enjoy as much credibility as they used to in the past (as some arbiters are biased based on sectarian orientation) and locals have grown distrustful of their ability to resolve conflicts and their good intentions. "They ate the Adal and left", said one sheikh about the arbitrators who failed to resolve the conflict between Shahik and Tanim.

The conflict was eventually resolved through an initiative led by Mobarak Mezraq, a person from the Murad tribe of Mareb, who happened to be the friend of the son of the person who was killed from Tan'im. Mezraq convinced his friend to reach out to Shahiks and end the conflict. With Mezraq's mediation (rather than

[70] Ali ben Ali Shulan, Muhsen ben Musen, and Saleh Anneni

arbitration) Sheikh Fakher Ali Fakher representing Shahek met with the son of the killed person from Tan'im. Eventually, the son pardoned the Shahiks and that ended the conflict. With that, both tribes made *tanseeb* for the graves of the two that were killed. In tribal culture in these areas, those who were killed in the conflicts are buried but, unlike other dead, with no stone at their graves. This implies that the tribe still has to take revenge for those who are killed. Once the revenge killing is resolved, like the case in this conflict, tribesmen put stones around the graves to indicate that no more revenge is needed.

This agreement was reached without any intervention either from the official (government) or tribal mediators (according to shaik Ali Fakher of Shahik). During the conflict the dam lost all the water in the lake to evaporation and has remained dry ever since. With regard to the water, the two parties Shahik and Tanaim tribes sat together without any mediators and both of them confessed to the water rights of each other and solved the problem directly and through a common face-to-face meeting include both sides, as well as themselves. During the interviews the parties were asked, whether -if the dam would be filled again- the conflict would be restarted. The two sheikhs said (in separate meetings) that the two villages had reached an agreement, that the dam is everyone's, and that they all have the right to use it. Although both sides stressed that the conflict will not renew, the agreement they had was verbal and was done in an emotionally charged environment.

Figure 7.2: Meeting with representatives of Shahik village, Shick Ali Faker in the right side

7.2 Case 2 - Arrowdah: villagers of Ber Julah against grape farm owner

7.2.1 Overview of the conflict

In 1985 a newcomer to the area of Arrowdah established a grape farm. In 1990 land adjacent to his land was flooded. He diverted part of the flood to his land. However, the flood passed to lower lands in the direction of other farms in the town of Arrowdah. The act of the new owner was considered hostile by the downstream land owners, since this act violated the traditional arrangements and the ownership rights of the downstream landowners to use the flood in that area.

7.2.2 A: Context and contextual changes

The main agriculture produce in this area are grapes and qat, with some plantations of vegetables such as tomato and potato for personal consumption and local markets. There is a noticeable increase in the area of qat growing as, according to the interviewees, it is the best choice in term of value return and qat needs less work and inputs. Interestingly, it is believed that qat as a crop does not consume more water as compared to other crops (seemingly even less as tomatoes), however as an increasing amount of the fields are cultivated with qat, the total amount of water needed for irrigation increases.
The expansion of the city of Sana'a had reduced the agriculture land area. The difficulty of farming has driven some local farmers to sell their lands for construction in order to benefit from the higher land prices created by the extension of the city.

With regard to groundwater, people are obliged to maintain a distance of 500m between the wells. Currently this rule is fully respected, as the more powerful dig wells as they deem fit; there is no control whether this rule is respected.
The customary rule which regulates the surface water irrigation is 'Ala'ala Fala'ala'. According to this rule, those who are in upper lands have the right to irrigate first. However, new users in higher areas have to respect the older claims of those in lands below them. When the flood arrives, farmers take water in turns to flood their fields. In order to achieve this purpose, alternatingly holes are made in the earth bunds that separate the fields.
In the area surrounding Arrowdah, floodwater is allocated to farmers through daily shares in a period ("dyala") of 19 days. When the 19 days end, a new period of 19 days commences, as such there are six "deyalat" in a four month periode. During the first dyala, one side of the village will receive water, while in the next dyala another side of the village will receive water, and so forth. The people are obliged to respect these shares because they use it since many years. These custom rules can not be changed, even if people would like to do so. The old men in the village underline that these rules also include historically acquired rights for the birds, cattle and other animals that drink during these days. Though these rules are still acknowledged, not all people respect these rules.

In addition, farmers use water distributed by tankers to irrigate their fields. The Ministry of Agriculture paid half of the tankers (the farmers paid the other half) in order to assist the farmers in bringing water to their farms.

The main complaint in this area is the increasing depth of the groundwater in the wells, which drives causes the owners to deepen their wells in order to acquire sufficient water to irrigate their fields. As in the previous

case, farmers need to cool the groundwater in pits before it can be used for irrigation. The second and most pressing problem these days is the non-availability of diesel fuel to operate their pumps and the high cost of the diesel on the black market, which sometimes reaches 4 to 5 times the official price. Due to the high diesel price, some farmers exchange their diesel pumps for electrical pumps. However electricity is only available for about three hours a day.

The costs of drilling a well and installing the necessary pumps and infrastructure sometimes amount to 20 million rial (68,000 euro!), which means that farmers have to participate in collective financing in order to drill a well. Normally these participants divide the water between them according to fixed percentages based on the share each one paid in buying the equipment. Sometimes disputes occur between the participants, extending to the tribes to whom they belong.

The security breach came as a result of the absence of a powerful state. After the 2011 revolution most of the authorities have become weak and thus lacked practical authority. Therefore, there is no commitment in maintaining a standard distance between the wells.
This security breach and the absence of the State is coupled with the appearance of new powerful men especially in the rural areas. These powerful men use groups of armed men to exert influence, sometimes leading to armed conflict.

Everyone can now do whatever he wants because of the absence of the law and everybody has a powerful man to rely on.

7.2.3 B: Conflict description and stakeholder analysis

In 1985 a newcomer to the area of Arrowdah established a grape farm in an area east of Arrwodah village called Azabiyb 15km north of Sana'a. Although the new owner obtained the land titles, no water rights were associated with the previously barren land. Irrigation in that area is derived from deep wells; the new owner had to buy water from these well owners in order to irrigate his farm.

In 1990 the land adjacent to his land was flood. He diverted part of the flood to his land. However, the flood alos affected the lower lands in the direction of other farms in the town of Arrwodah. The act of the new owner was considered hostile by the downstream landowners since this act violated the traditional arrangements and the ownership rights of the downstream landowners to use the flood in Ber Julah.

7.2.4 C: Dispute regulation mechanisms

The farmers in Ber Julah sent a representative to close the new farm owner's flood inlet, and to inform him that he had no right to divert and use the spate flood at any time. The new owner resisted and raised the issue with the community heads in the area. The community heads called for a meeting of the two sides in order to prevent any escalation of the problem. In the meeting the farmers of Ber Julh claimed that their rights are older and therefore have the right to irrigate before anyone else.
Agreement was reached that the new owner would have the right to divert flood to his land only after all farms established before him had irrigated their lands. The ignorance of the new owner of the principal of 'Al awal fa Awal and Al ala fal Ala' and the right of who have the first turn to irrigate from that flood was the main reason behind the conflict.

7.3 Case 3 - Bani Matar: villagers of Al Kharabah, Mahiab, Bait Awad and Bait Habes against villagers of Jalal

7.3.1 Overview of the conflict

The dispute arose between inhabitancies of Karabt Muhaeb over the waterstream Gayel Muheab. Karabt Muhaeb consists of two villages: an upper and lower village, between which the water stream flows. The conflict started when the people of the upper village started to dig holes and wells near and in the course of the stream to irrigate their fields. Apparently, this resulted in the disappearance of the surface water flow to the lower village. Fighting between the two villages erupted and the problem remains unresolved.

7.3.2 A: Context and contextual changes

At the lower escarpment of prophet Shoa'eb Mountain in Bani Mater - Sana'a Basin - four villages used to profit from the continuous natural flow of stream (Ghail) named "Ghail Mahiab". The villages in the lower region (Al Kharabah, Mahiab, Bait Awad and Bait Habes) had an agreement with the citizens of the villages located in the upper region of Sho'eb mountain (Jalal and others) not to grow crops, herd cattle or dig any well in or around the path of the ghail in order to protect its flow. The ghail is their main source of drinking and irrigation water, and their livelihoods depend on it. The villages are scattered on the sides of the mountain. The farming practiced in the area are plantations of almonds trees and some qat in the lower part of the wadi.

Figure 7.3: The higher well of 12m dug in farmer's field

7.3.3 B: Conflict description and stakeholder analysis

At the beginning of 2014, farmers from Jalal village started to dig four shallow wells at the upper location of "Ghail Mahiab" in order to draw water for drinking and irrigation. The higher well had a depth of 12m, the second 7-8m depth, the third was 3m deep and the drilling of the fourth well which was the lowest and closer to the Gail spring - was halted by the users of the Gail and closed. The upstream users were entitled to use the water of the ghail for domestic purposes and to provide water for their animals. According to the downstream villagers, these acts caused some spring sources of Gail Mahiab (which consists of more than on natural spring) to stop producing water.

The downstream users claimed that Jalal village has more than three springs producing water that they use for drinking and irrigation. However, the people of Jalal village people claim that their springs are almost dry and produce very little water; women spend most of their day to fill a 20-liter container for drinking and cooking purposes. The upstream villagers claim to have documents granting them the possibility to dig wells at the locations mentioned. A committee of the Ministry of Agriculture would have written these documents twenty-one years ago. The downstream villagers consider these documents to have expired. However, the villagers failed to show the documents to the interviewers.

7.3.3 C: Dispute regulation mechanisms

The drilling provoked the downstream people of Al-Kharabat, Mahiab, Bait Awad and Bait Habes to protest to the community leaders. They explained their concerns and accused the upstream villagers of illegal drilling. Both parties then discussed the issue and decided that is should be resolved according to tribal rules through the Mashaikh. They did not wish to take the conflict to the courts, because it would take too much time and cost them a significant amount of money. Furthermore, they did not trust the final court decision.

Mediators between the two sides suggested in the beginning that respected thirty-year old persons from each of the villages of Al-Kharabah, Mahib, Bait Awad, and Habes should swear that the digging of the wells is the reason behind the loss of the stream (Ghail) flow. Although this approach was initially supported, the downstream villagers later rejected the proposal for unknown reasons.

> We are not preventing them from the drinking water even when the quantities of water reduced. The second party has nine springs they are still running till now and they are drinking from it. We are not preventing everybody to come and drink from it. We are not preventing all our neighbors from the villages.

> The rule of "Al ala Falala" is for the flows but the spring or "Gheil" have its rules. According to the Shari'ah: "La Dhur Wla Dhirar", meaning, "No harm regards both sides" that mean that the proposed solution of the problem must not have any harmful effect on both sides. By digging those wells these wells for some persons but the other people birds, animals, and plants deprived.

Many meetings were subsequently held. The downstream villagers pushed the villagers from Jalal to go to the district of Matnah where the municipality could intervene to solve the problem. The authorities proposed to establish an investgatory committee, but the representatives from Jalal, based on the argument that the previous documents granted them permission to drill, rejected this proposal. Subsequently, at the district authorities the two parties were held in prison for about 12 days. Appearently the representatives of Jalal were called to sign that "there is a decrease in the quantity of water in the spring".

Thereafter, the issue was brought to the NWRA (National water Resource Authority), with a request to send a specialized engineer who could evaluate the case. The NWRA was accepted as a technical reference and its judgment would be regarded as unbiased. They all agreed to adhere to the final judgment of NWRA. If the new four wells would indeed affect the flow of the Ghail, then the new wells will be closed.

A water engineer from NWRA visited the location on 12 March 2014, met with both sides and investigated the sources of the stream (springs) and the bore holes (wells). When the consultants visited the area, on 27 March 2014, they found that the people from both two sides are waiting to receive the NWRA report. The latest news about it is that the engineer needed to visit the region another time.

Figure 7.4: Gail (stream) Mahiab springs

Figure 7.5: Consultants meeting with representatives of Gail Mahiab

Figure 7.6: Signing the agreement about acceptance the judgment of NWRA Sana'a Basin

7.4 Overall analysis

Water distribution and conflict resolution rules

Water distribution and use rules are written in Maraqeem (written customary rules). They handle issues such as sharing rain and floor water. Groundwater-usage came after the creation of customary law rules, and are therefore not included in the Urf. Most of the time, people manage to talk and agree on ways to share ground water and wells. However, one interviewee pointed out that violent clashes between tribes have occurred to two water wells (sometimes people from the same family). This can indicate that customary traditions fall short when it comes to new water extraction and distribution methods.

The cases investigated in Sana'a were solved through local community interventions by sheikhs or community leaders as the cases in Shaick and Arrowdah, with little reference to official office as was the case of Bani Matar. Saleh's policies and corruption contributed to the erosion of tribal values and undermined tribal sheikhs' authority and the functionality of tribal structures and systems.

Rule of law: Saleh's patronage network

Over his 33-year presidency, Saleh extended his patronage network to tribal leaders (sheikhs) to strengthen his power. He strengthened his rule through on the one hand, rewarding parties for their loyalty, and on the other by dividing tribes and stimulating tribal conflict. According to one interviewee, Saleh could achieve this aim by giving money and other incentives such as power, jobs, land, projects, and contracts as gifts to the same people. Furthermore, he used to supply fighting tribes with arms. "He would allocate bullets for us from the same warehouse".

Incentives were always given in return for blind loyalty to the General People's Congress (GPC) and Saleh. Saleh made local individuals sheikhs through money and power. These individuals had no status or experience in customary law or tribal traditions. Subsequently, they managed to garner loyalty and some support through providing jobs and incentives to local people, mostly through corruption and patronage. For example, the head of GPC branch and the Agriculture Cooperation Union was made a sheikh. He used to be a mechanic in the army. He is very corrupt and a person who managed to make billions through stealing public funds.

This undermined the authority of authentic sheikhs and created competition with original sheikhs and divisions along tribal lines. As a result, many sheikhs became more concerned with power and money and many turned their back on their communities. In some cases, sheikhs were even involved in corruption in local development projects and services. Conflict sides in these cases indicated a further decrease in both legitimacy and authority of tribal sheikhs, since the 2011 revolution.

> "Tribal leaders lost themselves to political parties. Each one hold on to his own parties and care about nothing else"

After the revolution: role of customary law and conflict resolution

As of now, the people still depend on the customary and traditional rules in order to solve their conflicts. However, on the one hand, in some areas people do not respect customary law as it was before the 2011 revolution. On the other hand, in the absence of government forces, in areas like Mareb, ALjawf and SHabwa tribal urf became stronger. Tribal conflicts disappeared in these governorates over 2011, according to an interviewee.

People nowadays choose between multiple strategies to resolve their conflicts. When tribal arbitration fails to resolve the conflict, mediation is used. Mediators are more successful than arbiters, but even then "only good and non-partisan mediators are helpful" according to focus group participants from Shahik. They all agree that mediators are more successful in resolving conflicts. Perhaps because mediators are not traditionally as influential as sheikhs and hence were not corrupted or distracted by political parties.

People do not usually proceed to the court to resolve their conflict, partly due to expense, but more importantly because it is ineffective. They prefer to resolve their conflicts on their own. "For us tribes, we use no courts when killing happens. We just use Urf (customary law)", said Fahdl Mana'a, Sheik Dhaman from Bani Husheish. Proving this ineffectiveness, he talked about more than 320 land dispute cases that people had attempted to resolve through courts for decades without success.

Sometimes a district director and security director can intervene in their own personal capacity to help resolve conflicts if people have asked them to. However, it is uncommon and participants could not remember any serious case in which they intervened.

Another challenge facing tribal conflict resolution is the death of the older generations who had the knowledge and experience to resolve conflicts. One interviewee counted six prominent sheikhs in the area that had recently died. Even though the sons of those tribal leaders and those who worked closely with them managed to learn the rules from the sheikhs, their knowledge and experience is still insufficient. Some mediators or arbitrators who lack the experience end up causing more problems. "They only take the rules they like and ignore the rest".

In the larger Bani Seham area, there is a family of Hashimites (the Al-Seraji family in Adhaba'aat) that traditionally played the role of mediators. During their rules, since 897, the imams intentionally established Hashemites communities in the crossroads between different tribes so that they can help mediate conflicts. They still do that until today.

In the power vacuum created by the 2011 revolution, new leaders have appeared, who wielded power by virtue of their link with new political parties. They could obtain power in the field of water, by becoming the heads of the newly established donor-funded, water associations.

One interviewed sheikh explained that women have an indirect influence by encouraging their men (husbands, sons, fathers, brothers) to cool down and not use violence. However, sometimes they trigger conflict by pushing them to take revenge, although that is not the norm.

Other issues

- Some locals, especially the youth, became disobedient and disrespectful of tribal sheikh's authority. This made it hard for authentic sheikhs to maintain order in the community and as a consequence led to increased tension and conflict.
- Participants indicated that high prices and sometimes unavailability of diesel was a problem. In the local market the diesel price may reach 3 -4 times the official price, which affects their livelihood and their capacity to continue their farming activities.
- Farmers have very little knowledge of the existence of the official water authorities and the Water Law that govern the use of water. Their concern is with the cost of diesel fuel and its availability on the market.

Chapter 8. Case studies in Wadi Siham

Key message:

- **Wadi Siham has experienced a process of commoditization of agriculture paralleled by social differentiation and weakening of power and authority of traditional local leadership, i.e., shaikhs;**
- **The Wadi Siham Improvement Project exacerbated a process of water control gradually moving upstream and concentrating in the hands of investors with a certain social, and often external, status;**
- **The revolution of 2011 weakened both traditional and governmental authorities even more;**
- **Both formal and informal conflict resolution mechanisms are increasingly weakened, ineffective, and corrupted;**
- **Local inhabitants go to traditional authorities for minor disputes, mostly related to family issues;**
- **People feel they are increasingly oppressed by a system of sheer corruption in which local elites, external powerful actors, and governmental officers are the winners in the control over water, while less powerful groups are left with no means to fight for their rights and solve water conflicts to their benefit;**
- **A main challenge is how to build a critical mass of local stakeholders to address overdue issues on water distribution and ensure the representation of the interest of the least powerful in this.**

Figure 8.1: Map of Al Hudaydah governate

8.1 A: Context and contextual changes

8.1.1 Physical dimensions

Wadi Siham is a basin in the Yemen's breadbasket, the Tihama plain along the Red Sea Coast. In previous decades it has witnessed an extreme rapid agrarian evolution through planned irrigation interventions and agricultural policies, as well as wider processes of social transformation and private water resource development.

Wadi Siham is one of six major wadis flowing into the Tihama plain to the Red Sea, originating from the Highlands of Sana'a. In Wadi Siham, seasonal floods are the main source of irrigation and the main reason for water conflicts in the Wadi. Floods occur in two seasons, during *Seaf* (summer) from March to May, and in *Karef* (autumn) from August to October.

Agriculture in Wadi Siham depends on three sources of water: rainfall (which is very low and averages 150 mm per year), groundwater, and runoff (base flow and flood flows). The types of runoff in Wadi Siham are *Sayl*, the sporadic and brief surface flood flows, and *Ghayl*, (perennial base flow). Until the last two decades, the base flow was the primary source of irrigation in the upper area of the wadi, while the sayl (surface flood flow) was the main source of irrigation in the lower part of the wadi. The base flow had diminished due to the overexploitation of the groundwater, water projects upstream and the construction of new check dams in the catchment. Due to the lack of base flow upstream, all lands (i.e., both upstream and downstream) have now become dependent on flood flow.

Groundwater was and still is a supplementary source of irrigation. It has played a central role in the development of tobacco (in downstream areas), and banana and mango cultivations (in upper areas of the wadi). Groundwater is heavily overexploited, particularly in the valley, and constitutes a major concern for both farmers and authorities. The estimated annual drop in the level of groundwater is between 4-10m (TDA, 2007).

Most of the agricultural users depend on spate irrigation with supplements of groundwater during flood and dry seasons. Farmers in the area cultivate three crops each season. The main cash crops are tobacco and banana, both requiring high amounts of water. Other crops planted are cereals such as maize, sorghum, barley and sesames. Mango trees can be seen in most of the fields, especially in the middle part of the wadi.

Irrigation modernisation and irrigation management transfers (IMT) began in the 1990s with the inception of the Wadi Siham Irrigation Project (WSIP). These programs were expected to "improve" inefficient flood-dependent, irrigated agriculture and to decrease the use of groundwater. Therefore, aided by foreign funding, and supervised by the Tihama Development Authority (TDA), the State embarked on extensive civil engineering interventions, a systematic single-wadi development that would eventually intervene in all wadis of the Tihama plain. Within the Wadi Siham Project (WSIP), four new irrigation systems[71] were completed with EU funding. As part of the process, the system has been partially transferred to its users through the creation of water user associations (WUA).

[71] Waqir Irrigation System (WIS), Barquqa Irrigation System (BIS), Debashya Irrigation System (DIS), and Khalifa Irrigation System (KIS)

8.1.2 Water allocation and management

As the spatial and temporal distribution of floods differs enormously, a precise picture of the inundation frequencies in the various parts is unavailable. On a general basis, downstream areas, Waqir and below, receive on average 1-2 floods yearly, whilst the upper area of Khalifa and Barquqa receive 5-15 floods. Although the annual flood flows have not varied drastically in the last decades, the overall feeling among farmers in the downstream parts of the wadi is that they have been tapering off, particularly in the last 10-15 years. The drastic decrease of groundwater tables combined with soaring diesel prices after 2011, contributed to the feeling of water penury among wadi dwellers.

While in upstream wadi areas close to the foothills of Jebel Boura floods are flashier in nature and more frequent, those in the lower reaches of the valley are floods of greater magnitude and duration, and occur less. Additionally, the upper areas of Barquqa and part of Khalifa (the middle stretch of Wadi Siham) had the right to irrigate with the base flow and arranged rotational turns among canals on the basis of traditional rules. The lower parts, Waqir and below, could count only on flood flows. Big floods covered both areas.

The above has implications on the choice of irrigation infrastructure. For instance, in the upper parts of Wadi Siham, smaller structures may be found to divert water into canals or directly to fields[72], while in the lower courts, farmers opt for larger sandy bunds across the wadi. These are more suited to divert primarily the larger flows. Different infrastructural characteristics put specific demands on the type of organisational structure required for their construction and maintenance. Due to the erratic nature of spate flows, in Wadi Siham, they differentiate between regularly irrigated areas; areas watered by base flow only; irregularly irrigated area and exceptionally irrigated area, both watered by flood flows. This creates the ground for the division of water rights and the ensuing differentiation of participation in organisational activities.

Al aela fil aela, “first the upper then the (next) upper”, is the rule for water distribution that is widely accepted by water users throughout the Yemen, and the Middle East. Whereas in neighbouring Wadi Zabid – time allocations apply for different sections of the river system, based on the law of Al Jabart,[73] in Wadi Siham only the upstream/ downstream rule prevails. It originates from one of the basic Islamic principles of irrigation that dictates that the farmers closest to the water source should irrigate before the ones further distant from it. This regulation has very practical reasons. Due to the erratic nature of flood flows, the easiest and most efficient irrigation method would be to follow the natural sequence dictated by gravity (Varisco, 1983). Additionally, farmers generally prefer few fields irrigated until the fulfilment of their requirements rather than many fields irrigated inadequately. Traditionally the al aela fil aela rule entails respect for historical rights and sets limitations to more recent upstream water use: in Wadi Siham we found that this rule has implications for both the construction of new irrigation infrastructure and irrigation turns.

The al aela fil aela rule implies particular water distribution patterns: when a flood arrives, the first barrier would divert it to the lands around, which is then irrigated field to field.[74] As soon as a field is removed from the home. The person in charge would breach the field bunds and release water to the next farmer.

[72] The slope of the land makes it difficult to block the river in the upstream areas, as bunds would wash out. In the middle section gradients are smaller and bunds are the prime system for diverting flood water

[73] Al Jabart is an Islamic scholar who lived in wadi Zabid in the 16th century and who is credited with – among others – settling the flood distribution rights for the lands on the sides of the wadi Zabid.

[74] This field to field system though inefficient in some respects has the advantage of systematically removing sediment from command areas (van Steenbergen et al, 2010)

Landowners would talk, or with the help of the aqil, find arrangements on the order of water distribution in case of disagreements. In case of excessive water, after irrigating the whole command area of a certain barrier, irrigation would start again from the first field. Whenever a flood is not sufficient for the whole area, the second flood would be led directly to those fields that had not irrigated before: those farmers who had irrigated were forbidden to reconstruct the bunds around their fields.

In Wadi Siham, the height of the field bunds is a measure for irrigation duration. Farmers can irrigate until water has reached the bund, which for sorghum is generally knee-high, for tobacco half-calf. This detail has implications for how water control developed in upstream areas and with mangoes. The allocation rule between two or more barriers remained unvaried: each barrier is meant to irrigate a particular area and when fully irrigated, farmers would make an opening in the barrier in a specific point close to the wadi bank letting water flow downstream to the next barrier. Over-irrigation of fields would be reported to the aqils or shaikhs and punished accordingly. Before the summer, farmers would refill the canal and repair possible damages in order to catch the next floods.

According to al aela fil aela, new farmers have room for appropriating the water resource upstream by constructing their own canals, as long as this does not affect flows to traditionally cultivated areas downstream. This shows how this rule traditionally protected downstream water requirements. However, in the past decades in Wadi Siham this rule has been increasingly loosely applied and this allowed an upstream appropriation of the water source, which does not appear in line with considerations for downstream land users and their requirement for drinking water for instance suggested by the Islamic law itself.

Traditionally, no mechanism existed for the capture or distribution of groundwater. The Yemen's 2002 Water Law requires a permit for a new wells deeper as 60m. In practice this could not be enforced in Wadi Siham.
The largest single impact on groundwater availability, however, comes from the construction of the different spate diversion structures, as described earlier. As several of these were constructed as cut-off weirs they blocked the subsurface flows in the wadis, which are a main source of recharge of the well. As a result wells down stream of new structures dried up.

8.1.3 Shaikhs and Aqils

When it comes to criminal acts such as murder, people use the court. However, apart from these issues, people rely on tribal leaders for dispute resolution. *Aqils* carry the heavy burden of resolving conflicts at the village and community level. People would come to them to resolve family and community disputes. This includes fighting between children and other non-significant, yet draining, types of disputes. Aqils do not receive a stipend from the Government for their role in conflict resolution. If an Aqil is unable to resolve a conflict, they direct the injured party to go to Sheikhs. Most of the conflicts are resolved orally. Yet, for complex conflicts people would proceed to arbitration. In most cases, shaikhs or social figures will act as the arbiters. Conflicting parties need to choose two Odool (plural of Adel), one for each side. The Odool studies the case, including all evidence and advice. Therafter, the arbiter will issue a verdict.

Some sheikhs have jails. When the research team visited sheikh Qaserah, he pointed to a room in his house and explained that was used as jail. A young man was held in the room (jail), because he eloped with a local girl whose family refused to accept his proposal to marry her. The sheikh is now trying to come to a solution. People can socialize in this 'jail', but have moral obligation to abide by the shaikh's verdict (moral jail). More importantly, a jail in this sense is also a form of protection that the sheikh provides. Without being in this jail, the young man and the girl who eloped with him might have been subject to abuse and possibly murder. The sheikh told the researcher that the girl is in "jail" inside with her family.

In Wadi Siham, sheikhs are particulary influential in the lower parts of the valley, where agriculture developed first.

There are historical reasons behind this. During the time of the Imams, the prestige of sheikhs reached its climax, for the Imam bestowed them with powers and legitimacy. From the 1940s until the 1970s, Shaikh Suleyman Saleh controlled the whole "Wadi Siham" area under the Great Imam Yahya and ruled until shortly after the Imamate's demise. When sensitive quarrels occurred, e.g., if some rich farmers attempted to build new dams along the wadi or to upset the traditional system of water division for their own gain, the matter was brought before the judges in Maraw'eah, who were usually shaikhs. Whenever the local shaikh could not solve a dispute, he turned to the *Naeb*, a Governmental organ situated in Maraw'eah, where important religious judges pronounced the verdict.
However, the shaikhdom/aqilat in Wadi Siham was never as strong as in other wadis or Yemeni regions. Varisco attributes this to the ephemeral nature of the flood: according to him a stronger tribal structure emerges in areas where a permanent base flow supports irrigation practices (Varisco, 1983).

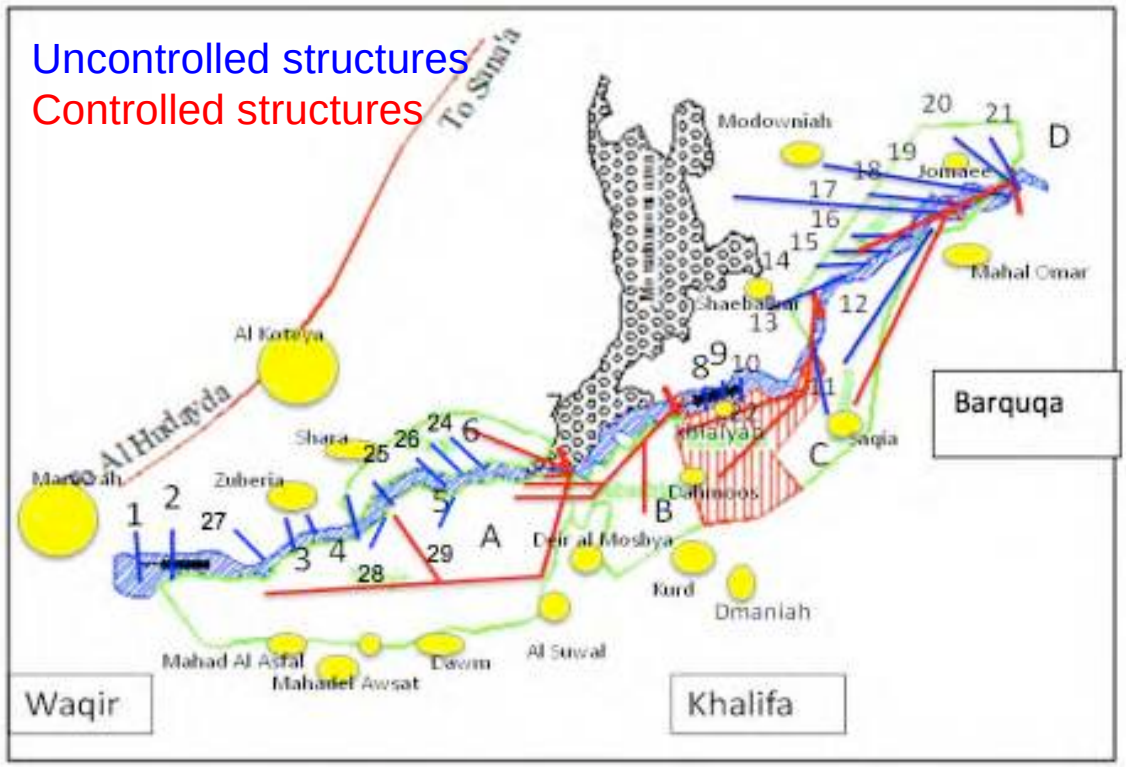
8.1.4 New actors and institutions

With the establishment of the Yemen Arabic Republic in 1962 in the North of Yemen, new institutions for water management emerged. Among the new institutions that play a role in the management of surface and underground water resources are: the Tihama Development Authority (Hudaydah), which is primarily concerned with irrigation infrastructure and extension services, and the Local Council (Maraw'eah) that mainly solve local disputes.
Since its establishment, the TDA became the main point of reference in disputes between farmers in the correct use of water, and no other entities have challenged this role, either by proposing management mechanisms or providing any initiatives in this matter. The traditional leadership in the area continues to play a role in solving social problems and issues at the farm level, while the TDA's role focuses on the main flood structures and the canal system.

The TDA's presence nowadays is a contested one: farmers blame it for both its creation of irrigation problems (with the introduction of the new infrastructure and WUAs) and its inefficacy in solving them. Nevertheless, for better or worse, its role in irrigation management remains a central one. In Wadi Siham, all types of farmers (large and small owners, sharecroppers, and workers) in the wadi refer to this authority.
Although it has no direct involvement in Wadi Siham's spate water management, the Local Council's role in solving disputes between farmers and claim making, including those concerning irrigation, seems to be gaining ground. Whilst the power of aqils has gradually declined over the last few decades and has been contained to village level, several farmers admit that they would rather appeal to the Local Council, as nowadays they generally believe it is a more efficient institution for finding solutions than local village heads.

8.1.5 Water control moving upstream

Wadi Siham offers a large variety of irrigation structures (see Figure 8.2). The first distinction is between controlled and uncontrolled irrigation structures. Most traditional systems are uncontrolled, non-permanent structures managed by farmers (earthen canals, small spurs, and large sandy bunds accompany permanent dams and are intersected by lined canals and gates as shown in the following picture). Controlled systems have permanent structures that give greater diversion and control capabilities, and are managed by a public agency (Lackner and Vincent, 1998; van Steenbergen et al., 2010).



KEY			
Sandy Barriers/Haghus	*Lateral dykes/Mandubi*		*WSIP*
1. Mahadeli	8. Humaiqani	18. Marzouki	A. Waqir
2. Bahlooli	9. Beshari	19. Qaserah	B. Debashya
3. Shroefia	10. Khlalyah	20. Wajeh	C. Khalifa
4. Husseini	11. Saqia	21. Shamiri	D. Barquqa
5. Uthun	12. Dehna	22. Hajar/ Hakoume	
6. Qamusia	13. Syali	23. Beshari NEW	
7. Akm/ Waqir	14. Matani	24. Mohammed Yahya	
	15. Khanani	25. Omar Qadi	
	16. Magaribi	26. Mohammed Abdallah	
	17. Barquqa	27. Humaiqani	
		28. Mohammed Ali Sanaa	
		29. Hassan Karar	

Figure 8.2: Wadi Siham's irrigation infrastructure

Spate irrigation technologies and water access have transformed in time and space across the Wadi, which is intrinsically related with changing water governance and agrarian relations. Three factors were crucial in enabling collective water governance:

1. Strong co-operation reinforced through a common objective, i.e., agriculture;

2. A hydrological context that forced farmers to collaborate on the infrastructure's maintenance;
3. An authoritarian, but respected figure that coordinated construction and maintenance works, and supervised the barriers' operation.

In the past, Wadi Siham's local society was characterised by pastoralists in the upstream areas and agriculturalists concentrated specifically in the downstream locales of the wadi, where few owners owned large plots of cereals, tobacco and cotton.
Nowadays, external investors, who live outside the area, focus on cash crop production in the upstream regions of the wadi. These developments occurred primarily because of individual entrepreneurship and financial liquidity of the newcomers.
Yet, external factors were equally significant for the shift of water control to the newcomers, as they created its enabling context: diminishing floods downstream, successive migration waves, a changing social, institutional and economic context, land shortage, conducive agricultural policies that initiated credit and subsidies for groundwater exploitation, and a national ban on imports. Without these factors, individual initiatives would not have found the fertile space for entering the wadi, with all of its embedded implications.

8.1.8 Wadi Siham Improvement Project (WSIP)

According to project reports of Wadi Siham, the WSIP provoked a redistribution of water upstream, where large-land owners growing mangoes have access to the water, whilst forcing several downstream areas to turn to rainfed agriculture. Additionally, these reports state that the acquiescence of governmental agency responsible for the new structures was partly to blame for this redistribution of the water. A generally held view is that irrigation interventions entail a process that violently disrupts the "indigenous", "egalitarian", and "functioning" pre-intervention agrarian equilibriums. While the scope for modernisation of traditional spate irrigation systems has been critically discussed as a driver of water reallocation and livelihoods insecurity (van Steenbergen and Mehari 2008; van Steenbergen et al., 2008), this dichtomy does not consider that within this "traditional" world, paradigms of agricultural development alternative to the subsistence one may already have existed. This is the case of Wadi Siham, where an evolving local society played a prominent role in shaping patterns of water control - technologies and access - around larger spate interventions.

The WSIP undeniably attracted new investors with the prospect of an increased water supply upstream and certainly influenced the present water distribution patterns to the detriment of the wadi's downstream areas. However, already long before the irrigation improvement project, a line of commercial transformation of agriculture began, which was paralleled by a water control gradually moving upstream and concentrating in the hands of investors with a certain social status. Together with this water redistribution in the upper locales of our study area, a social differentiation also occurred. As far as it concerns irrigation issues (water appropriation, water distribution, resource mobilisation, and maintenance), the power of local landlords has gradually been substituted by that of the emerging class of external, commercial "farmers", who in turn benefit from TDA machines and support. Hence, the Wadi Siham Irrigation Project exacerbated, rather than initiated, a preferential water allocation in Barquqa, to the detriment of the rest of the wadi.

8.1.9 Irrigation Management Transfer (IMT)

Irrigation Management Transfer led to unintended consequences. In 2003, a Water Users' Association (WUA) was created with farmers from upstream areas of Barquqa and Khalifa to maintain the lower tiers of the irrigation system. In the beginning, its leaders received funding from the European Commission for the participatory maintenance of the new irrigation scheme. Rather than strengthening participatory management, it sends the opposite signal. The WUA were used by individualistic powerful landowners to

enhance their influence on decision-making for their own benefits. This phenomenon has reached such an extent that nowadays many of the normal farmers turn directly to the TDA for technical help, advice, complaints and even conflict resolution, instead of turning the traditional leaders. The belief spread among downstream farmers that only by organizing in a formal WUA, they could "get things done", i.e., receive governmental funds for the irrigation development. Along these lines, two further WUAs emerged downstream, under the thrust of local leaders.

One of IMT's principal drawbacks was its failure to consider the particular nature of each pre-existing organizational unit (water-networks). Additionally, if a WUA does not clarify rights, responsibilities, benefits, and obligations of each member, farmers quickly lose interest in collaborating even in a context where community-managed irrigation is common practice (Beccar et al., 2002). With the disappearance of spring flows, the wadi depends on the same water source (flood water), which is diverted through the TDA. However, at the organisational and operational levels no real coordination and communication between water users and managers of the different infrastructure exists.

Water conflicts in Tihama wadis, including Wadi Siham relate mainly to the flood flow and are related to the violation of project's water distribution rules and/or customary arrangements, "Urf". The flood flow is the main water source for farming in Tihama wadis. On its water depend important cash crops such as tobacco, banana and mango, and subsistence and fodder crops. Particularly after the Governmental dramatically raised diesel prices after the revolution, flood water constitutes a vital resource for agriculture and local livelihoods. In Wadi Siham conflicts on groundwater use are unusual – as the competition for water is less obvious because less visible.

8.2 Case 4: Person 81 versus local farmers along the Debashiya canal

8.2.1 B: Conflict description and stakeholder analysis

Debashiya Irrigation System (DIS) is located immediately upstream of Waqir and was completed in 2005. It was built to overcome WIS's technical deficiencies as a result of which a whole area previously entitled to water rights could not irrigate. In theory, DIS should irrigate 1,000ha. Yet, to date the new canal irrigates a much smaller area than it was intended, because a powerful landowner is preventing floodwater from reaching downstream farmers who previously had access to the floods from a traditional earthen canal but who were neglected by the WSIP.

The man, whom we will call person 81, a contractor from Amran governorate in the North of Yemen, is a newcomer in the wadi. In the early 2000s, while he was entrusted by the TDA with the construction of a governmental guesthouse in Wadi Siham, he bought many hectares of agricultural land in the upper reach of Dabashiya canal. The problem started in 2004 when person 81 started blocking the water from running into the farms in the lower part of the valley (wadi)[75] arguing floodwater would degrade his soils. To mitigate his fears, the TDA constructed a mud barrier with an opening in the middle (Zabeer) to reduce the flow passing through his lands to a safe level, albeit that this would have been sufficient to water downstream farms. Person 81 agreed in the beginning, but soon changed his mind and continued to block the water flow with a metal gate (Figure 8.3).

Figure 8.3: Person 81's property

[75] The farms are on a long wide valley surrounded by small hills so higher land doesn't mean up a mountain.

In parallel, the TDA wanted to extend the Debashiya canal by 2,000m in order to reach the farms previously excluded by the project. Person 81 opposed the extension of the canal alluding to the following arguments:
- The design proposed that the canal pass through his land; and
- He feared the amount of floodwater available for his fields would decrease.

Several upstream farmers along Debashiya canal were initially on the side of person 81, also fearing the canal extension would significantly decrease their water supplies. Eventually, TDA technicians sent to discuss the issue were able to convince all upstream farmers except person 81, who persisted in his opposition.

As a result of the blockage, several local farmers located downstream of person 81 have not been able to irrigate the from Debashiya canal. Farmer Hassan Sagheer (with 56 ma'ads or 2.5ha) could not irrigate his lands. Two other farmers and several of their collaborators did not have any chance emigrated to Saudi Arabia to find a job. According to Hassan Naji, a local guard who controls and maintains person 81's water gate, at least 20 farmers would gather around him every time the flood comes insisting that he opens the canal and sometimes verbal-clashes occur.

Farmers have no other choice but to rely on very expensive groundwater as the diesel price skyrocketed after the 2011 revolution and is often even unavailable on the official market. According to Hassan Sagheer, cultivating one ma'ad based on groundwater irrigation at current diesel prices, would cost him around 50,000[76] Rial and the return would be around 40,000 Rial. "We can only survive as farmers by irrigating from the flood flow and person 81 has cut off our supply of flood water. We will not cave under the pressure and abandon our lands, nor will we sell it as this is the wish of the people who push us to get to this by depriving us from our rights to the flood" (Hassan Sagheer).

8.2.2 C: Dispute regulation mechanism

As the water conflict relates to a WSIP irrigation structure, farmers so far have almost entirely relied on the TDA to solve the conflict.
According to the customary law, a newcomer to the area has to abide by the following set of rules:

- He has the right to irrigate according to the land he bought if the land has right of flood;
- He has no right to amend or change the features and the sites in the catchment area around him;
- He pays his share for any cost that would be paid by the community he lives in either for establishment or maintenances of local roads, rehabilitation of the wadi base and the flood distribution system or any yearly incurred cost as set by the local community he lives in.

Both formal and informal negotiation mechanisms proved too weak and were unable to solve the conflict. The traditional water division rule "Al aela fil aela", was neglected by person 81 as were the aforementioned customary rules. In the mid 2000s, Mohammed Bin Qaserah, a well-respected local shaikh attempted to negotiate with person 81. However when person 81 did not co-operate, he told him assertively that he is an "outsider" and that he better abide by the rules of that area or else would face the consequences. Person 81 then co-operated and agreed to open the gate to let floodwater flow to downstream farmers. However, soon after Qaserah's death in 2010, person 81 re-blocked the canal. The son of the sheikh was too weak and never stepped in to fill the vacuum left by his father.

[76] 1 USD=215 Rial

The TDA was the sole organization to take some initiative to try to solve the conflict by proposing technical alternatives to prevent possible damages to person 81's farm. The landlord boycotted all initiatives. TDA could not get any help to force person 81 to co-operate, although it sometimes requests the help of "Mashaikhs", local wise men. Since the district government also bears a role in settling disputes surrounding water, four years ago, affected farmers and the TDA submitted a formal complaint to the district director to resolve the situation and force person 81 to co-operate. "But so far no response", said Ameen Saleh from the TDA. According to key interviewees, person 81 has connections with influential people in the Government or security who back him up. The transitional period since 2011 contributed to the continuation of this situation as the Government's influence has grown even weaker.

Affected landowners also asked their neighbours to intervene on their side, but they lack the required social power to face person 81 and were afraid of retaliations. According to the WSIP manager, powerful landowners have a great influence on water allocations and by cutting off floodwater from smallholders; they aim at pressuring them to sell their land at a cheap price.

Appealing to the court also did not appear to be a fruitful option for the local farmers, as they pointed out that the court does not have a "very good reputation" in the area. "We only know the authority (TDA). They have to resolve this", said Hassan Sagheer, a farmer affected by the canal blockage.

According to another local farmer, the problem with person 81 will only be solved if a critical mass of people of the area gathered and stand against him and if this was not possible, he (the interviewee) and his people could leverage support from his tribe, the Bani Hushsh.

8.3 Case 5: Person 82 *versus* Person 83 along Waqir main canal 3

8.3.1 B: Conflict description and stakeholder analysis

Waqir Irrigation System (WIS) was established in the early 1990s to supply water to approximately 3,448ha previously irrigated by traditional sandy barriers. Three canals were to have their inlets after the main intake: WMC1, WMC3 (which crosses the wadi through a culvert and flows on the left bank) and WSC.

However, the system was poorly designed and implemented. Several issues were raised by both farmers and TDA engineers: under-dimensioning of Waqir's dam, and its wrong location; WMC1 is lower than the fields and of low capacity. WMC3 has no secondary canals, only few gates, and a low capacity. Besides that, the initial design did not include an area of land upstream at the head of WMC3, so that several farmers did not have access to canal water.

To make up for this, the Tihama Development Authority (TDA) constructed a new gate in 2006 located next to the inlet to WMC3 to irrigate these areas. Because of low capacity at the headworks, to let enough water flowing through the gate, the TDA put a large wooden plank to block part of the head gate of WMC3 (Figure 8.4). The gate of WMC3 supplies the lands of one of these farmers whom we will call person 82.

Figure 8.4: The wooden plank used to divert water to the gate that takes some floodwater to person 82

Yet when a road was built parallel to the main canal, a new problem arose. Due to the lack of coordination between the TDA and the road contractor, the road was built too high causing the culvert underneath the road, connecting the canal to the fields of person 82, to be lower than the field outlet, which prevented an adequate water supply to its fields. The technical problem was exacerbated by the deposition of sediments in the fields, thus raising their level even more relative to the canal bed (Figure 8.5).

Figure 8.5: Culvert design leading to sedimentation

The conflict emerged when person 82, encouraged by the TDA, created a removable barrier of sand bags in the main canal to raise the water level to a height that would facilitate water to flow into his fields but that would still allow for an overflow to reach downstream farmers (Figure 8.6). However, some farmers downstream, (e.g., person 83) complained and protested against this act claiming that the TDA is disturbing the traditional water distribution system by holding the water in the canal upstream for 4 hours, while often flood flows would diminish after 2-3- hours. Unhappy with the situation, person 83 removed the bags. When person 82 continuosuly returned the bags back, the situation escalated to the point where person 83's men pointed guns at person 82's farmers and threatened to kill them.

Figure 8.6: Left photo: the canal in which the soil bags are put to divert floodwater to Person 82's land. Right photo: channel that goes from the main canal to Person 82

It is difficult to say who is right and who is wrong in this conflict, as there are many facets and versions of the situation. According to person 82's farmers, person 83 has abused them because he is well connected and powerful while they are powerless. Person 83 is a political security officer. Political security is known for being one of the most corrupt government departments and many of its officers have a reputation of being involved in corruption, extortion, intimidation, and human rights abuses.

During the construction of WMC3, several large landowners managed to push for modifications of the original design to their benefits. WMC3 should have been longer and irrigate all the way until the village of Shara (Figure 8.5-right). However, its length has been drastically reduced. According to TDA engineers there were financial issues underlying these modifications, which were caused by the withdrawal from funding of the Kuwait Fund for Arabic Economic Development (KFAED), one of the major donors of the WSIP.

"We put the bags in the canal to get some water only when we hear that person 83 is in Sana'a or abroad, just like thieves", said Omer Abdullah, representative of person 82. Famers of person 82 sounded very frustrated, angry and hopeless. They haven't been able to produce sufficient crops for three years and they see no signs that anything would happen to turn the situation around. They are particularly frustrated that they've donated much of their land for the TDA project. "My father donated a whole mountain and plenty of land for the public good and now we are treated like this?!!" said Mohammed Saad, a local farmer. "He treats us like chicken. That is how he sees us", added Omer Abdullah.

On the other hand, person 83 expressed his discontent with the new water distribution system implied by the WSIP. According to him, the WIS upsets the old Manadeb system (plural of mandab[77]) and as a result, many farmers lost access to water. Moreover, person 83 argues that according to irrigation traditions in the area, person 82 does not have prior flood water rights. His farm is located at higher elevation and, therefore, falls out of the area that was originally inundated by the flood, which is included in the Manadeb system.

Person 83's problem with the TDA arrangement is that the piece of wood, that is used to divert water to Person 82 and others, prevents the full flow in WMC3. This results in siltation and sedimentation in the canal, contributing to its reduced capacity. Furthermore, the soil bags that are used to divert water to person 82's lands have made matters worse. Person 83 claims that this arrangement has prevented water from flowing to 1000 ma'ads including his land and others and that due to almost total lack of maintenance by the TDA, the canal's capacity further reduced consistently.

[77] A mandab is a traditional hand dug canal (or sandy barrier) that diverts flood water from the wadi to farmers' fields.

8.3.2 C: Dispute regulation mechanism

Figure 8.7: Farmer asking heaven for all Government to disappear

This issue has created a sense of anger and rage among both upstream and downstream farmers (figure 8.7 and 8.8). Person 82 farmers rely on the TDA to resolve the conflict. They don't want to go to court and they don't trust the government. "The government can come and kick us out from our own land", yelled the son of Abdullah from person 82, a twenty something young man. "We sent a complaint to the security but they did nothing. If we go with an official complaint to the government, they'll throw us in the Central Prison. There is no state here", said Abdullah.

Figure 8.8: Farmers demanding action from government representative

TDA's management of the situation seems to have contributed to the conflict. On the one hand, in early 2012, person 83 managed to put pressures on the head of the TDA to remove the wooden plank at the inlet of WMC3 and to refrain person 82 from putting back the sand bags in the canal, although the situation remains unresolved today. On the other hand, the TDA project manager thinks that this is an unbalanced action against person 82. According to Ameen Saleh, the head of operation and maintenance at the TDA, there have been discussions within the authority to replace the bags in person 82's canal with concrete to resolve the ongoing conflict but the request is awaiting approval and has been caught in bureaucracy.

With no resolution in sight, the patience of both sides of the conflict is growing thin. Both indicate they'll resolve the matter with violence if necessary. "Maybe we should just claim all our land including that in which the canal runs and let the government deal with it." A farmer from person 82 whose father donated the land to TDA said. Equally, person 83 indicates he'll "blow up" the canal and put the old Manadeb system back to work.

Person 82 did not try to reach out to the shaikh simply because he had an ongoing conflict over land with person 83 in which one person was killed already. "We didn't want to add this to that conflict", he said.

During a stakeholder consultation meeting held in Amman (see Annex 6), a representative of the TDA and person 83 revealed conflicting positions of the matter. The government representative wanted to describe the crisis as a result of several natural phenomena (e.g. the Sesbania propagation, decline in rainfall over the past years etc), local tribal conflicts, and lack of enough financial resources. On the other hand the farmer insisted on corruption being the main reason behind the conflict. Towards the end of the discussions, the farmer admitted that he once threatened the governmental official to death if he did not came up with a solution.

A review of letters issued by the Ministry of Agriculture indicated that the ministry instructed the police to interfere and arrest one of the influential corrupt farmers who was stealing others' water. However, the letter was suspicious as it was not sent to the police by a court. A closer analysis by the research team of several other letters and discussions revealed that such actions were taken only as false hints by the government to show that it was trying to do something, which in fact it was not.

The fact that the Water Law is not enforced led farmers to solve the water conflicts either using tribal law or civil law, but only when a conflict results in human life losses. This created a sense of helplessness among the poor farmers. The choices were either accepting the status quo or enter into violent armed conflicts threatening their own lives and the lives of members of their families. They know that going to court for a water conflict case is a waste of time as it takes several years in court to get a judgment.

There were attempts to involve civil society organizations, including NGOs, universities and community organisations and associations but unfortunately they did not lead to any solution either. There were some participants in the stakeholder consultation meeting who suggested that even civil society organisations joined the circle of corruption. This happened either in mismanaging donors' money, government assistance, and entering the loop of working for influential rich people in the area.

8.4 Overall analysis

A main observation is that there are several informal and formal conflict resolution mechanisms, yet all of them are too weak. The post-2011 events have for the time being contributed to the overall weaknesses of State organizations and have divided and weakened the traditional mechanisms, by creating more diversity and more politicization. The National Dialogue Outcomes emphasize the development of a genuine civil state in Yemen – also as different from the earlier system of political patronage where local leadership was co-opted into support for the central power and amply compensated by direct transfers of funds, assets and privileges. Whilst the transition makes change, it is also easier said than done. Based on the analysis of Wadi Siham, a main challenge is how to build a critical mass of local stakeholders to address overdue issues on water distribution and ensure the representation of the interest of the least powerful in this.

The two case studies presented above exemplify the deep agrarian, socio-economic and political transformations Yemen and the Tihama Plain have undergone in the last several decades, which also have had tangible consequences for water control and the materialisation of water conflicts. Below we analyse several drivers behind increasing water disputes in Wadi Siham and assess the effectiveness of the dispute resolution strategies that were chased by the parties.

Agrarian change, political transition, and the dissolution of local leadership

As highlighted at the beginning of this chapter, Wadi Siham, as well as other wadis of the Tihama, have experienced a profound agrarian change which started in the 1980s and led towards a gradual process of commoditization of agriculture. External forces (subsidised inputs, cheap fuel, ban on imports, cheap land etc.) all contributed to the attractiveness of investments in the Tihama by newcomers, in many instances urban businessmen. At the same time, several local farmers migrated to Saudi Arabia in search for better-remunerated labour.

This process was paralleled by social differentiation and weakening of power and authority of traditional local leadership, i.e., sheikhs. Altogether, this meant a decrease in the levels of trust and cooperation, and an increase in individualism and opportunism. Customary laws and traditional rules concerning water access, distribution and use, once so fundamental for local social organisation around water management and farming and for socio-economic development, have been gradually losing importance and strength in the wadi in the last decades. The new investors who lack knowledge and respect for traditional irrigation practices have aggravated this situation.

The 2011 revolution weakened both traditional and governmental authorities even more. As an interviewee observed, “Nowadays the law of the forest reigns, we are living in a jungle!” Discrimination in all its kinds has prevailed and is perpetuated by the tribal, the district, and the religious sects. Nowadays, as a local farmer rightly points out, everyone claims his rights to water, at any time and by any means. The power dynamics on the ground allow those with more power to abuse the rules in order to have a larger share of the water. “Who has power gets to irrigate… Who doesn’t will go without”, argued shaikh Asad Hague, a shaikh from Wadi Moore.[78]

[78] A short interview with Shaikh Asad Hague, April 13, 2014, TDA, Hodeidah

When Saleh visited Wadi Siham in 2011, many farmers saw the ex-president embracing the powerful players; all the influential men accompanied him in his visit. "Farmers became afraid of those influential men." Political friction between the parties led to violations of civil rights, people with unjust causes would gather others around them, provide them with weapons and start to abuse others and disturb the general peace. "For example if you have a farm land and you don't have connections and support from certain shaikhs in the area, your land may not be irrigated; this case is happing to one of the TDA staff who has a piece of land in the wadi and without the intervention of the TDA his land would have no water. This deterioration started in 2009 and continued after the revolution."

As formal systems, particularly the security services, are regarded as corrupt and law enforcement authorities unreliable and ineffective, people continue to resort to traditional actors for certain issues. However, with the death of the elder generation, local traditional authority has vanished; the new leadership - the "generation of sons" - is far less powerful and has become increasingly involved in political activity, thus loosing legitimacy and authority at the local level. Accordingly, nowadays most of the conflicts for which Abdulkareem Qaserah, the shaikh of Maraw'eah district and Wadi Siham area, is sought are for minor issues, mostly related to family issues e.g., resolving marital or family disputes, as well as other disputes resulting from car accidents and disagreements between neighbours.

Despite some general exceptions, sheikhs in the Tihama are known for abusing their people. The overall perception is that they care more about serving the agenda of the ruling elite in the country than that of their constituency. Since the tribal system and sheikhdom has never been as strong in the Tihama as in the north of Yemen, sheikhs often acted as the regimes heavy-hand against their own people during the 2011 revolution. This is very different from the north of Yemen, where strong tribal sheikhs are still reasonably accountable to their constituencies.[79] A list of corrupt shaikhs has been handed over during a discussion meeting held in Amman to the facilitator of the meeting. Names are provided in a separate annex.

TDA, Irrigation modernization and the "upstream" bias

The outcomes of the WSIP in terms of technical implementation and water management have been, and are, remarkably shaped by the project's interaction with the receiving context and its actors. WSIP exacerbated a process of water control, gradually moving upstream and concentrating in the hands of investors with a certain social, and often external, status. Receivers are not passive entities and appropriate change in very diversified according to their possibilities. There are always winners and losers in the control over natural resources. Issues of power, which are intrinsically related to a wider historical, cultural, and socio-political context and processes, are absolutely fundamental in the appropriation of discourses around a given water resource (Metha, 2007).

Design of physical infrastructure is never neutral and technical faults are rarely simply technical problems. Instead, they are often political as they hide the vested interests of specific socio-economic groups. As it appears, powerful farmers managed to direct the WSIP implementation to their own advantage by pushing for modifications in its original design. Less powerful farmers were unable to influence the process. This process, coupled with a relative/absolute water scarcity, heightened social differentiation between upstream (near the new canals) and downstream water users; those with direct access to spates via new works reduced the share of water belonging to the downstream area. Upstream, in Barquqa, commercial landlords managed to rehabilitate their canals and negotiated for a building permit for new gates on the new canals. Similarly, in Waqir, canals were redesigned after water users exerted pressure. In addition, several technical and

[79] Interview with Hadi Hague, April 12, 2014, Hodeidah

operational choices introduced by the WSIP are debatable. Particularly in Waqir, technical faults are widespread. Although technical faults are seldom the result of deliberate acts by the engineer, they are consquences of a lack of transparency and accountability. Technical faults can severely impede the irrigation system from functioning properly and as such can significantly hamper the achievement of a project's objective. Additionally, by creating a situation of water scarcity, they open up further spaces for power games, conflicts, and unequal water distribution. The boundary between vested interest and corruption becomes blurred. Often, the excuse of water resources development hides the real purpose behind powerful stakeholders who aim to channel and manage funds and public money to reinforce and nurture their patronage systems.

After the implementation of the WSIP, the TDA is considered by local farmers to be the only institution responsible for the delivery and management of the floodwater resources and for settling disputes concerning water distribution in WSIP canals. In attempting to solve conflicts of water division between upstream and downstream farmers, some years ago the TDA established an irrigation committee to regulate the distribution and use of floodwater from the diversion structures of Waqir and Kalifa following the Al Jabart rule. This system functioned for two years, but showed flaws at times when the floods were too small, as upstream farmers would retain most of the water. For solving the specific conflict between person 82 and person 83, TDA proposed various technical solutions, which however were rejected by downstream farmers. Both case studies exemplify a lack of authority over large landlords by the TDA and other governmental departments. A significant contribution was the inconsistent and short-term insight displayed by the TDA in trying to manage the dispute, which in and of itself was contradictory to the internal conflict within the TDA, specifically between its head and the WSIP project manager. That is true at least in the case of person 82. The TDA project manager expressed his frustration with the head of the TDA who, in his opinion, made the situation worse when he gave orders to remove the barrier diverting water to person 82's land without understanding the situation and without prior consultation with him and the engineers. Participants to a workshop in Amman suggested that the TDA has been forming lobbies with influential politicians, heads of tribes, and businessmen who own large pieces of lands near the barrier and who have been taking people's shares of water to irrigate their own lands.

Finally, the TDA faces major budget constraints that impede adequate maintenance of canals, and management of the system, thus exacerbating water scarcity and conflicts. The project manager of WSIP mentioned that he ends up borrowing money from tribal shaikhs to cover salaries of his local staff that were delayed by the government. Limited resources and poor management have both caused TDA's intervention to be ad hoc and temporary. This all has major implications for TDA capacity to resolve conflicts and handle delicate situations concerning water distribution.

WUAs as new power centres

As many scholars highlight, in the last decade WUA's promoters have often neglected the importance of the process of creation of such an organisational model. As a consequence, these WUAs are often created with a management team at the top that takes all executive and decision-making dimensions. No power trickles down to lower levels. Political actors would siphon funds away and legalise illegal practices and would easily capture these weak organisations. Rather than being a mechanism for broader empowerment, the WUAs in Wadi Siham became an instrument of elite and funds capture.

Especially during and after the revolution, water user associations have become a receptacle for arms and weapons purchased with external support. This way they converted into yet another system by which powerful stakeholders can exert their vested interests in the face of a weakened governmental authority and at the detriment of others. Contrary to anticipated contribution to good water governance in the wadi, the

establishment of WUAs is regarded even by the TDA as a big mistake and WUAs as a general threat to local security. In the TDA's eyes, internationally funded water projects in Yemen have had the unintended consequence of reinforcing local power centres and contributing indirectly to the situation of chaos and insecurity. Governmental authorities lost, if they had at all, power and tools to enforce law and rules. Also the TDA lost its traditional leadership after the 2011 revolution. Furthermore, increasing corruption and bribery among security authorities by local landlords is sweeping away some of the last options available to less powerful farmers to fight for their rights and solve water conflicts to their benefit. Behavior against customary laws not only affects water division, but also threatens land ownership.

8.5 References

Beccar, L., Boelens, R., Hoogendam, P., 2002. "Water rights and collective action in community irrigation.", In *Water rights and empowerment*, edited by Boelens, R., & P. Hoogendam, .Assen: Van Gorcum.

Mehta, L., 2007. "Whose scarcity? Whose property? The case of water in Western India." *Land Use Policy*, 24, 654-663.

TDA, 2007. Monitoring wells: Draw down GW Table 2001-2007. Tihama Development Authority, Republic of Yemen.

Van Steenbergen, F., Lawrence, P., Mehari Haile, A., Salman, M., Faurès, J-M., 2010. Guidelines on Spate Irrigation. FAO

Irrigation and Drainage Paper No. 65. Food and Agriculture Organisation of the United Nations, Rome, Italy.

Van Steenbergen, F., Mehari Haile, A., 2008. Unlocking the potential: Improved support and sustainable development of spate irrigation. In: Spate Irrigation Expert Consultation Meetings, Proceeding of FAO conference, Cairo, Egypt, 5 to 11 April, 2008.

Van Steenbergen, F., Verheijen, O., Van Aars, P., Mehari Haile., A., 2008. *Spate Irrigation, livelihood improvement, and adaptation to climate variability and change*. IFAD, Rome, Italy.

Varisco, D. M., 1983. "Irrigation in an Arabian Valley. A System of Highland Terraces in the Yemen Arab Republic." *Expedition Philadelphia*, 25(2): 26-34.

Vincent, L. Lackner, H., 1998. Participatory irrigation management in spate irrigation. A report for ODI-World Bank. Wageningen University

Chapter 9. Case studies in Ta'izz

Key message:

- **The cases studied in Ta'izz area show water disputes happening due to random well drilling and transfer of water from one area to another for qat irrigation. The cases studied indicate an alarming increase in disputes concerning water over the past three years. Interviewees, including conflicting parties, overwhelmingly agreed that lack of rain and the deterioration in government function, as well as the security situation over this period have triggered the conflicts.**
- **The conflicts are a manifestation of a series of structural factors that reinforce one another. This includes population growth and competition over increasingly scarce water coupled with a lack of informal and formal traditions to regulate water use. Poor government capacity, lack of coordination between central and local government authorities, centralization, ambiguous laws, and lack of policies to address water problems are also key factors.**
- **All interviewees agree that the problems escalated due to the overconsumption of water to irrigate qat farms. They all agree that qat is a major problem threatening water resource in their area. In the absence of clear regulations for water use, coupled with the enforcement of these regulations, disputes seem to be stuck in cyclical competition about water; those who need water for drinking and home use, particularly ordinary citizens, seem to be more vulnerable, compared to those who are well-connected to power holders. The latter group actually seems to benefit from a dispute.**
- **Attempts by government authorities to resolve the conflicts are temporary, *ad hoc* and coercive in nature. The root causes of the conflicts remain completely unaddressed. According to the General Secretary of Almaafer local councils: "Water disputes are sensitive and they escalate too quickly. Disasters are coming our way if nothing is done about it soon".**

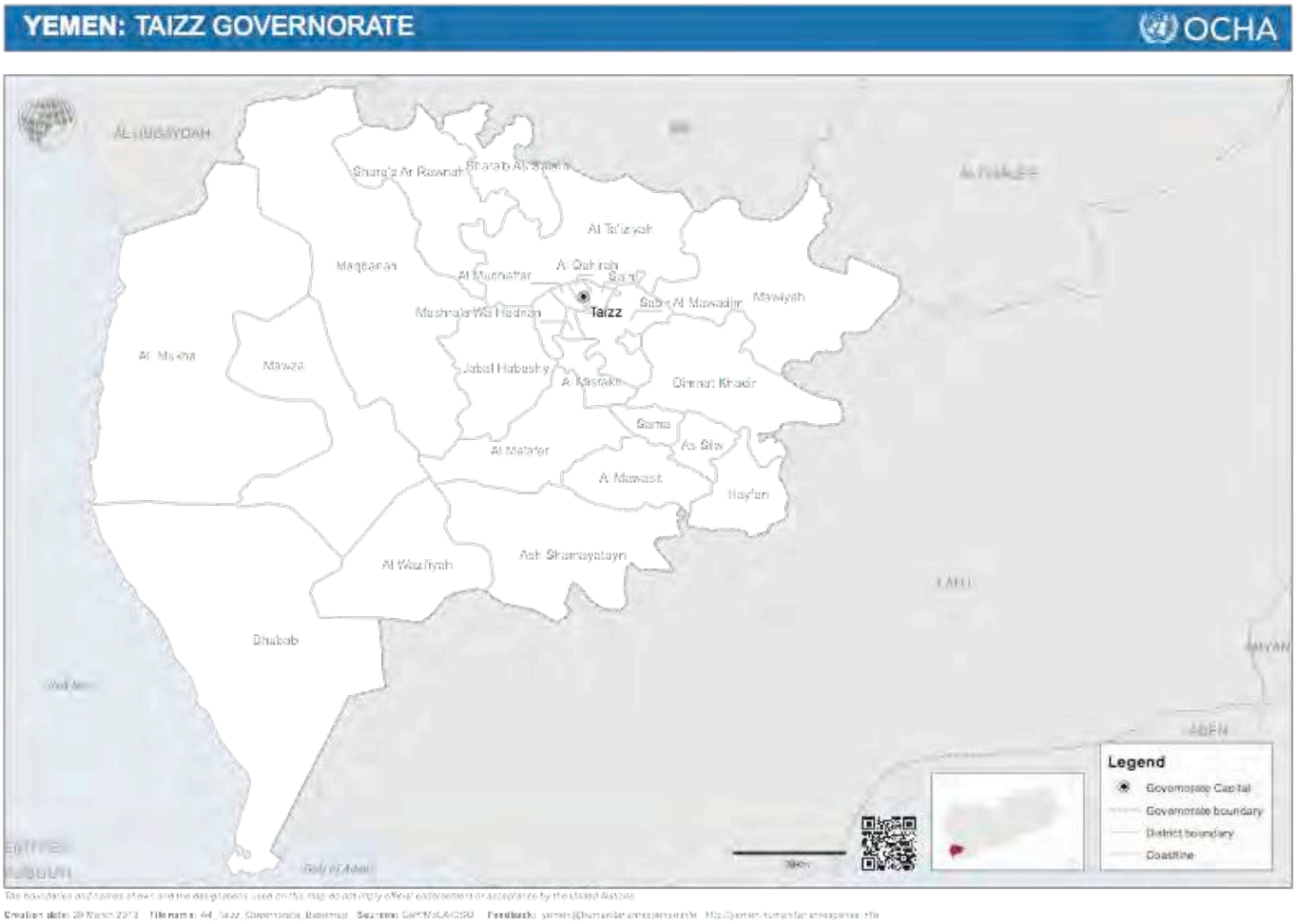


Figure 9.1: Map of Ta'izz governate

9.1 A: Context and contextual changes

Ta'izz is facing a serious and complex water problem. Competition between urban and rural water uses is ever present. Agriculture continues to draw a large amount of groundwater for irrigation, urban population grows, industrial expansion takes place and total groundwater demand has increased sharply (Van der Gun & Riaz, 2004). This competitive approach of abstraction by the farmers and water supply agencies has already led to rapid depletion of aquifers, depriving farmers of their means of livelihood and has in turn created an environment of conflict (Al-Shaybani et al., 2005).
The crisis in the Ta'izz area represents a case of total water management failure. The failure occurred because of the absence of feedback and support processes between the Government and the local societies throughout the implementation of all water strategies adopted by the Government (Mohieldeen, 1999). To understand the reason for the conflicts concerning water, an overall description of the area that includes the physical causes of the water crisis, the main institutions and stakeholders and socio-economic situation of the area is necessary. Thereafter, an overview of the main water conflicts in the past, the effects of unreliable water supply in Ta'izz city and some examples of cooperation will be provided.

9.1.1 Physical profile

The Ta'izz region is in the upper part of Wadi Rasyan catchment in the south-western Yemen Mountains, it extends between the latitudes 13º 34' and 13º 47' North, and the longitudes 43º 48' and 44º 12' East. (Farag et al., 2013). The region is located within a low plateau that lies in an east-west faulted sink 25km wide. The sink descends from 1500m in the east to less than 900m in the west in a series of step-faulted blocks of stratified volcanics, which dip to the east or northeast. The eastern edge of the area is covered by a flat loess covered plateau, forming the surface-water divide between the Red Sea and the Indian Ocean (UN/DDSMS, 1997).

Water resources of the region are heavily dependent on rainfall, which varies substantially from one sub-area to another within the same catchment. While the mean annual precipitation for the whole area is around 568 mm, the highlands receive a greater amount of 800mm. The pattern of rainfall in the region is bimodal with one peak occurring in April/May and the other in August/September. (Van der Gun & Riaz, 2004)

Wadi Rasyan is one of the seven major wadis that form the Red Sea drainage basin. The central zone of the Ta'izz region receives surface water flows from all zones in the upper wadi Rasyan catchment. The estimated volume of these flows is about 9 million cubic meters per year. The total volume of flow leaving the upper Wadi Rasyan catchment every year does not exceed 12 million cubic meters. Other important wadies are wadi Al-Haima and wadi Dhabab. Wadi Al-Haima receives about 3 million cubic meters of lateral surface inflow annually. Most of it is from the high rainfall area Dhi Sufal. Wadi Dhabab receives about 0.5 million cubic meters of run-off water from both Jabal Habashi and Jabal Saber (Van der Gun & Riaz, 2004).

The Ta'izz region has three main aquifer systems. They are alluvial aquifers, volcanic aquifers, and sandstone aquifers. The alluvial aquifers are the uppermost layer. The primary means of alluvium recharge is from floods and from irrigated areas. The alluvial aquifers are quite shallow. In most areas, their thickness does not exceed 30 to 40 meters although, locally, they can be up to 70 meters thick. The depth to the water level in alluvial aquifers is less than 20 meters, but in most cases water can be found 11 to 13

meters below the ground surface. The smaller depth to water makes this aquifer exploitable by dugwells, which are found in abundance in the area. In many zones, the alluvial aquifers are prone to over exploitation. The quality of the water is generally good (Van der Gun & Riaz, 2004).

In addition to the alluvium deposits, water is also found in fractures in the volcanic rocks that dominate the sub-surface in the study area. The thickness of these rocks in the study area is estimated to be 600-700 meters. The volcanics are generally not a very productive source and yields of wells dug in these strata are low. The water is also of poor quality. This is specially the case where the fractures are connected to overlying alluvial aquifers in the polluted zones, although poor water quality in the volcanics also has natural causes (e.g., naturally occurring salinity in some zones) (Van der Gun & Riaz, 2004).

Another major source of groundwater in the area is the deep-seated sandstone. This formation has proven very productive elsewhere in Yemen and is the focus of exploratory efforts in the Ta'izz region too. However, the sandstone aquifer in the planning area has not yet been fully exploited except in Dhi Sufal zone where NWSA wells, in addition to some farmers' wells, tap into this aquifer. These wells have high yields and quality of water is also good (Van der Gun & Riaz, 2004). Table 9.1 illustrates the 1993 dugwells and 306 boreholes that had been constructed up until 1996. Some of which have become dry due to high rate of abstractions.

Table 9.1: Wells and springs in Ta'izz region.

Well type	Number of wells
Springs	88
Dugwells	1993
Boreholes	306

Source: Data files of NWRA well inventory 1996

Nearly all of the streams in the Upper Wadi Rasyan catchment that flow for at least six months of the year are polluted by, or entirely comprise, domestic and industrial waste water. Domestic waste accounts for most of the total pollutant load. Some industrial wastewater is known to contain heavy metals, but levels are not monitored (Handley, 2001)

9.1.2 Water institutions

There a many institutions, both governmental and non-governmental, involved in the water sector in Ta'izz. The government institutions involved in the Ta'izz water sector and their responsibilities are summarized in table 9.2:

Table 9.2: Responsibilities of governmental institutions involved in the Ta'izz water sector

Institution	Responsibility
Rural and Urban role	
Governor's office	Government of Ta'izz governorate, including civil law and order
NWRA	Water resources, policy and management
TWSSP	Financially, technically and institutionally facilitate water transfer to Ta'izz
Rural Emphasis	
Agricultural office	Execution of agricultural law, dams and irrigation schemes; other

	agricultural fields
AREA	Research and extension for agriculture
CACB	Provision of development finance for farmers
GAREWS	Rural water and electricity supply
IDAS	Enhance self-help capacity of farmers
Local councils (LCs)	Promote and manage local, rural development including water supplies and irrigation
LWCP	Implementation of water monitoring, irrigation and forestry projects
SURDU	Rural development, including irrigation, extension and monitoring
Urban Emphasis	
NWSA	Urban water and sewerage supply
TSWSSSR	Help NWSA branches towards a more autonomous and commercial basis and encourage PSP in urban water supply and sanitation provision

Source: Handley (2001)

The non-governmental institutions in the region are mainly traditional support systems within and between communities, sheiks and the private water sector. Joshi (1995) summarized some of the traditional support systems of co-operation within and between communities related to water use that are described in Table 9.3.

Table 9.3: Traditional support systems

Support system	Description
Al-Ana or Al-shamla	Communal "voluntary" work. Penalties for those not volunteering. Well digging, bridges, dams, rebuilding after calamities
Al-Muthaha	Mutual support among neighbouring farmers - irrigation equipment, labour etc
Al-` fi Majal Al-ray	Co-operation in irrigation - one farmer is responsible for distributing water collected during rainfall

Source: Joshi (1995)

Sheiks and the "suruub al miiyaah" managers (water distributor) have a prominent role in the water sector. Sheiks are usually senior members elected by local families on the basis of their knowledge of customary law and Shari'ah and for their maturity and impartiality (Handley, 2001). Finally the major area of non-traditional initiatives in water supply has been in the private sector. For instance, private companies who supply drinking water in urban and rural areas (Handley, 2001).

According to Handley (2001) the relevance and role of the non-governmental traditional institutions stands in direct contrast to that of the governmental institutions. Although there is a tradition of co-operation this has been limited to irrigation and rural water supply. The sheiks system is also open to principal-agent abuses, but can and must be worked through, rather than around.

9.1.3 Socio-economic situation

According to the 1994 Population Census, the city's population comprised 317,000 inhabitants, while the area as a whole was approximately 650,000. (Van der Gun & Raiz, 2004).

Agriculture, practised mostly in the main wadis and in the highlands, is the primary means of livelihood for the rural population. Rainfed agriculture accounts for approximately 75% of the agricultural water use in the area. The major crops that are grown under irrigation are sorghum, maize, coffee, mangoes, papayas, bananas, tomatoes and qat (Handley, 2001)

With the availability of motorised pump technology, it became possible to exploit groundwater resources on a scale previously unthinkable. This trend was aided by at least two other factors. First, the boom in remittances from Yemenis working abroad helped finance the investments in new wells. Second, the government subsidies on fuel and drilling equipment made these investments more attractive (Van der Gun & Riaz, 2004). Table 9.4 shows the amount of water use for agricultural purposes.

Table 9.4: Total water use in the rural areas of Upper Wadi Raysan Area

Agricultural purpose	Amount of water use
Rainfed Agriculture	100 Mm^3/yr
Groundwater irrigation	30 Mm^3/yr
Stream-fed Agriculture	3 Mm^3/yr
Rural domestic use	2.5 Mm^3/yr
Livestock	0.3 to 0.4 Mm^3/yr

Source: Handley (2001)

According to Van der Gun & Riaz (2004), the total groundwater use in the sector is nearly 30 million cubic meters per year. This constitutes approximately 68% of the total groundwater use in the area. Roughly half of the groundwater use in agriculture takes place in Al-Haima and Shara'b zones. In these areas, a significant proportion of land is under qat. Increasing dominance of qat in the regions cropping pattern has been one of the reasons behind the agricultural sector's higher water use.

The city suburbs accommodate most of the largest industrial plants that provide employment for local people. Most of the working male population of the countryside work in the city and return to their villages, daily or weekly (UN/DDSMS, 1997). Most of the major water consuming industries of Ta'izz are involved in the processing of foodstuffs and drinks. However, the soap, ghee and paint factories also use substantial amounts (Handley, 2001).

Access to water for domestic use in Ta'izz provides great contrasts, particularly between urban and rural water access, and forms part of the distinction between urban and rural environments. According to Handley (2001) there are six main sources of water in Ta'izz city. These are public utility NWSA, private piped supplies, tanker supplies, free water (which can be obtained from the Government, private and mosque standpipes at various locations around the city), bottled water (available from grocery stores) and jerry-can water (this water is distributed to grocery stores where it is purchased as treated drinking water). It can also be purchased from the companies, which treat the water and their branches. However, it is not referred to here as "treated water", because it may not have been treated. Table 9.5 summarises the water supply provision in Ta'izz region.

Table 9.5: Water supply provision in Ta'izz

Source	Ta'izz average in %	Ta'izz rural in %	Ta'izz urban in %
Public piped supplies NWSA	17	3.8	79.5
Co-operative project	12.1	13.2	6.6
Private project	3.3	3.2	3.6
Well	48.6	57.2	7.9

Source: Handley (2001)

The annual water demand for the city as a whole was estimated to be over 6.3 million cubic meters in 1996 (Van der Gun & Riaz, 2004). Van der Gun & Riaz (2004) estimated that the population of the Ta'izz City would increase from 0.4 million in 2004 to nearly between 1.8 million to 2.3 million inhabitants in 2020. A city of this size would require from 36 to 41 Mm3 of water annually. Further Van der Gun & Riaz estimated, based on the growth rate assumed in the city's five year plan (1996-2000), that the industries located in the Ta'izz planning zone would need approximately 13 million cubic meters by 2010. This would increase to a staggering 27 million cubic meters by the end of planning period by 2020. It will be extremely difficult to find such quantities of water for the city's domestic and industrial use.

9.1.4 References

Al-Sabri, A. & Halim, M.K. 2012. *Status and New Developments on the Use of Brackish Water for Agricultural Production in the Near East,* Cairo: FAO.

Al-Shaybani, S.R., and A.S. Al-Zubayri. 2005. "Water Conflicts: Ta'izz and Tuban Case Study." Sana'a: World Bank.

Farag A.A., Al Gabiri A.S. & Abdulgader A., 2013. Surface water pollution and its effect on groundwater in Ta'izz basin. Available at: http://www.yemenwater.org

Gerhager, B., & Sahooly, A. 2009. "Reforming the Urban Water Supply and Sanitation (UWSS) Sector in Yemen." *Water Resources Development*, 25(1): 29-46.

Handley, C. D. 2001. *Water stress: some symptoms and causes. A case study of Ta'izz, Yemen*. Ashgate. Surrey.

Joshi, A.R. 1995. *Informal Support Systems in Yemen*. Sana'a: World Bank.

Koop, R. (2008). Safe drinking water for Ta'izz, Yemen: improving incorporation of microbiological water quality in urban drinking water supply. Master thesis. University of Twente, Enschede.

Moench, M. 1997. *Local Water Management: Options and Opportunities in Yemen. Survey Report of the Decentralized Management Study*. Sana'a: World Bank.

Mohieldeen, Y. 1999. "Responses to water scarcity: social adaptive capacity and the role of environmental information. A case study from Ta'iz, Yemen." *Occasional Paper*, (23). Water Issues Study Group, School of Oriental and African Studies (SOAS), University of London

UN/DDSMS 1997. "Hydrological and Land-use Studies in Ta'izz Region (Upper Wadi Rasyan Catchment) (TCD CONTRACT NO: YEM/93/010-3)". *Dar El-Yemen Hydroconsultants & SOAS*, Volume (1): Main Report.

Van der Gun J & Riaz K. 2004. *Water Resources Management Action Plan for the Ta'izz Region (second edition).* Republic of Yemen: National Water Resources Authority Policy and Programming Sector.

Van Steenbergen, F., Bamaga, O., & Al-Weshali, A. 2011. Groundwater Security in Yemen: Who is Accountable to Whom. *Law Env't & Dev. J.*, 7:164.

Ward, C. 2009. "Water conflict in Yemen: the case for strengthening local resolution mechanisms." In Jagannathan, N.V.; Mohamed, A.S. and Kremer, A. (Eds), Water in the Arab World, pp. 233-267. Washington, DC: World Bank.

World Bank. 1996. *Yemen: Local Water Management in Rural Areas*. Washington DC and Sana'a: World Bank

World Bank. 1998. *Ta'izz pilot water supply project. Midterm review mission report*. Sana'a: World Bank.

9.2 Case 6 - Shararah: villagers versus Persons 92

9.2.1 A: Context and contextual changes

There was an old well in the village at Shararah area, in Arrahedah, Demna District, that did not have sufficient water. Villagers say that they have experienced drought over the past few years and the price of truck water can reach YR7000 (about $35), which is very expensive by local standards.
Women used to walk for more than 5 kilometer to fetch water from another water source, sometimes at nighttime. The Member of Parliament (MP) representing the area, asked the Rural Water Authority to dig a new well. A local businessman helped with the costs and the project was completed. Since 2010, the locals use the groundwater, for domestic purposes but not for irrigation. The well is only 35 meters deep and, therefore, relies mainly on rainwater. The Akel pumps the groundwater to a reservoir before distributing 10 small plastic containers of 20 liters each to each house. People who want more water are able and permitted to fetch manually more water manually from the well. Six villages in the Shararah area also benefit from the well.

For surface water, the traditional rule is Supreme to the High. This means that those higher in the valley have the right to irrigate first, followed by those lower to them and so on. For groundwater, the rules stipulate that priority should be given to water use for drinking and domestic use, followed by irrigation. Also traditional rules indicate that anyone, even those from outside the area, have the right to use water for drinking and domestic use.

9.2.2 B: Conflict description

Approximately eigth months ago, the sons of Abduljabar from the village up the stream saw that there is plenty of water in the well so they started to dig a well that is 50 meters upstream. Villagers say that Abduljabbar's sons are digging the new well in order to irrigate their qat farms. Fearing that this will cut supply and feeding to their well, the locals of Shrarah reported that to the security. Security threw some of Abduljabbar's sons in jail for two days. According to the villagers, they paid security a bribe and were released. Then they continued to dig their well.

The locals reported the issue to NWRA Ta'izz. The NWRA sent an enforcement officer, who filed a report to the Prosecution indicating the well digging as a "criminal activity". However, the prosecution office was closed due to a judicial strike. The villagers issued two letters to the governor and deputy governor, yet the digging continued.

When the researchers arrived on site, coincidenly some security soldiers came to arrest someone from Abduljabbar's men who happened to be supervising the digging of the new well at that moment. The researcher tried to talk to him and he said that they needed the water to drink, but then it became difficult to talk to him as he was arrested.

9.2.3 C: Dispute regulation mechanisms

People mostly go to Akels to resolve their problems. There are no major conflicts or disputes in the area. Most of the disputes are about children fighting, marital problems etc. The sheikh is

Mohammed Mansoor Ashawafi, the Deputy Governor of Ta'izz. The population does not seem to trust him.

9.3 Case 7 - Bani Yusof: villagers of Qihaf *vs.* Person 93

Conflict sides: People in village of Qihaf represented by Abjuljabbar Mokred versus Person 93 from Uqf nearby village; Bani Yusof, Almawasit district.
Place of meeting: Qihaf village where researcher had two focus group meetings, one with men and one with women from Qihaf. Due to time limitations, the second party in the conflict was not interviewed.

9.3.1 Overview of the conflict

At the end of 2012, Person 93 from the Uqf village, located opposite to Qihaf with the wadi in the middle, started drilling a well higher in the valley only 220 meters away from the Qihaf well. He dug three wells and could not find any water. He subsequently attempted to dig another well only 170 meters away from the Qihaf well. The citizens of Qihaf buried the new well. Abjuljabbar Mokred, a teacher, and representing the Qihaf villagers, filed a complained at the security authority and paid for soldiers to come and deal with the situation. The security did nothing and Uqf continued to dig the well. Eventually, the villagers of Qihaf ran down the valley and buried the new well. Person 93 and his men shot them. Mokred reported the situation to the prosecution, but he said there was no response and no action was taken to the digging of the new well.

9.3.2 A: Case study description

The two villages of Qihaf and Uqf are separated by a wadi/valley. Both villages are situated up in the mountains where people rely mostly on skills, such as carpentry and agriculture for income. The people of Qihaf grow qat, but they rely only on rain and they do not irrigate qat using ground or truck water.

The village of Qihaf, where approximately 130 houses reside atop of a mountain, relies solely on one well further down the valley. The well is 33-years old and has been used only for drinking and home use, rather than irrigation. With funding from the Social Fund for Development, new water reservoirs were built to cultivate rainwater. Until a year ago, women were still mainly responsible for fetching water from the well. They would spend at least an hour and a half to bring a 20-liter plastic container home. During the dry season, women would spend hours to fill one container and would spend most of the night doing that, sometimes exposing themselves to risks. The women mentioned running into some large, wild animals when they were travelling to bring water down the mountain around 2:00 a.m. approximately 12 years ago.

To end the suffering, the villagers of Qihaf decided to build a system to pump water from down the wadi/well to a reservoir in the village. The project was built between 2001-2011. Locals all shared the costs and raised funds from private donations with a total of 10 million YR, of which the locals contributed at least 5 million YR. Women contributed with gold, but most importantly, every house contributed with labor to build the project. Women would carry stones down the mountains. Each house was responsible for feeding those who worked on the construction of the well. "It took the men a whole day to bring the big water pump down to the well", said a local female.

Finally and in 2012, they managed to extend the water distribution network from the well to the reservoir in the village. Since then villagers have enjoyed the comfort of having water transferred into water tanks in their own homes. Houses would take turns, a big house would get two hours of supply and a small house would get one hour. During the winter the well dries up. Locals rely on the water they've pumped up to a large reservoir in addition to buying truck water from outside the area.

Locals said that when electricity service came to the village in 2013, Uqf started using electric pumps to withdraw water from their own wells, which, in the opinion of Qihaf, caused some of their wells to dry up.

9.3.3 B: Conflict description

In end of 2012, Person 93 from the Uqf village, located opposite to Qihaf with the wadi in the middle, started drilling a well higher in the valley only 220 meters away from the Qihaf well. He dug three wells and could not find any water. Then he attempted to dig another well that was only 170 meters away from Qihaf well.

The Qihaf villagers represented by Abdujabbar Mokred filed a complaint at the security services, and paid for soldiers to come and deal with the situation. The security did nothing and Uqf continued to dig the well. Eventually, the villagers of Qihaf ran down the valley and buried the new well. Person 93 and his men shot at them. Mokred reported the situation to the prosecution but he said there was no response and no action was taken to the digging of the new well.

End of January 2013, the security referred both parties to prosecutor's office. The prosecution put Ghamen and Mokred in jail in addition to Abdullah Adhamari, the acting Akel of the Uqf village who, according to Mokred, helped escalate the situation. The prosecution's office deputy talked to both parties and then visited the side and, according to Mokred, said that the people of Uqf and Person 93 have no right to dig a new well. Instead he suggested "arbitration". Mokred and the Qihaf villagers refused arbitration because they cannot compromise when it comes to the only water source they have. According to them, Uqf has at least 12 water wells that they use for drinking and for irrigating their qat farms.

The Qihaf villagers had no problem with Uqf digging a well as long as they observes the Water Law regulating a minimum 500 meters distance between wells. Also, the Uqf women come and use the Qihaf well to wash their clothes and Qihaf never attempted to stop them. To Qihaf, the traditional rule is that everyone has the right to use water for drinking or home consumption.

Mokred also reached out to NWRA Ta'izz who sent a lawyer to the prosecution's office, but nothing happened to resolve the dispute. The Qihaf villagers already spent YR450,000 (approximately $2,100) for transportation, paying security to come to the site, and other expenses to process the case against Person 93 and Uqf with no results. Currently, Person 93 stopped digging the well but he might resume the digging any time. The dispute remains unaddressed and open to escalation.

9.3.4 C: Dispute Resolution Mechanisms

The Akels resolve minor conflicts within their communities (rather than between communities). The Akel in this case was jailed, because he was partisan and taking the side of Uqf where he comes from and according to the interviews his role further escalated the conflict, rather than trying to resolve it. When the local authority building was opened recently in the Almawasit district, people will go there to complain about issues if they need to. But people remain mainly dependent on Akels and peaceful settlements. Most Akels with experience have passed away. The new ones are not as good and do not have sufficient experience to resolve problems. Locals mentioned that their MP is Sultan Assame'ei, one of the elite politicans loyal to former president Saleh. "We only see him during elections. He becomes so humble and talks to everyone. However, as soon as the elections are over, we don't see him anymore", said a local man. Local councils, prosecution and security did not have any effective role in dealing with the conflict.

9.4 Case 8 - Al-Horoor Water dispute, Halhalah Area, Khadeer District

9.4.1 Overview of the conflict

This is a water dispute caused by Qat, where Qat, a narcotic leef that Yemenis chew everyday and that consumes a lot of water. Person 94 has been overconsuming well water to irrigate qat farms that are outside the area. Qassems family, who live in the same community, indicate that the overconsumption of water by Person 94 has left their wells dry. As a result, they have insufficient water for domestic use and their farms. During the dispute, Therefore, they started drilling two wells: one higher up in the valley, above Person 94's well, and one close to Person 94's. This is what caused the dispute. Person 94 won five court cases against the Qassems. Another farmer believed that these cases were won by Person 94 trough bribes and because of connections in the government. He also had the advantage of being a lawyer himself. Person 94 also filed a complaint with the NWRA in Ta'izz. The NWRA sent an enforcement officer, who wrote a report to the prosecutor. This resulted in another court case, further contributing to the antagonism between the conflicting parties. With a huge distrust in the court system, the Qassems resorted to NWRA Sana'a for help. The NWRA in Sana'a sent an engineer who studied the situation, met with both sides and wrote a report on the problem and proposing recommendations to solve it. They also wrote a letter to the district director of Khadeer District. It concerned a request that he, the judiciary and the security authorities in the district would consider the NWRA recommendations in order to maintain water sustainability and promote stability in the area. The inconsistent and conflicting approaches of the two NWRA offices to address the dispute highlight the lack of insitutionality and coordination within NWRA itself. Informal mechanisms to resolve the conflict are very weak offering no alternative for solutions.

9.4.2 A: Case study description

The people in the area live in a rural community of a few thousand residents, with vast pieces of land in a valley that is surrounded by small mountains. Locals mainly rely on agriculture for their income. Qat is the main crop produced in the area. There is around 900 akers of land in Halhalah, and according to a report of NWRA, about 90% of the agriculture, is qat. Locals also grow corn and coffee, mainly for local consumption. People rely on ground water and rain during the wet season for irrigation; hand dug wells are used for drinking water and domestic consumption.[80] Disputes over water occur during the the dry season when a lack of rainwater together with decreasing levels of ground water leave the landowners with little resources for their agriculture.

Qat is not indigenous to the area. Local farmers brought it in the mid 1990s. As a cash crop it is very profitable and always high in demand. However, Qat consumes water more than any other crop. Interviewees mentioned that the competition over water to irrigate qat farms contributed to the conflicts in the area. They also mentioned that as the growing of qat expanded, the number of conflicts over water increased. Those who irrigate the qat farms with the water from their wells, charge 3,000 to 5,000 YR per hour, operating nonstop for 24 hours during the raining season, thus making a huge profit by Yemeni standards. According to a report

[80] NWRA, Report on Halhalah on the Water conflict between Hassan Mohammed Qassem and Abdurazaq Obaid, February 17, 2014

by NWRA Sana'a, more than 95% of the well-water is used to irrigate water over more than 10 kilometers in the area.[81]

Yet rainwater has not been sufficient over the past three years. Person 94, one side of the conflict, mentioned that he used to sell water at YR3,000 per hour, using two water pumps from his well for 24 hours nonstop. Now he can only pump four hours a day. Most people in the area have to buy truck water from tents dozens of kilometers away to irrigate their qat. According to the district director, random well drilling is increasing at an alarming level. NWRA in Ta'izz provides permissions (in a letter format) to drill wells without reverting to the district director or district council[82].

According to the district director, the traditional rule is that Alaqrab bel Aqrab (the closer then the close) that means that those closest to the water source have the priority. The traditional rule also says the priority should be given to drinking water before irrigation.[83] However, the rule does not seem to be clearly reconginzed in Halalah as conflict sides have totally different understandings of what the traditional rules are.

Person 94 talked about a traditional rule in which each well owner irrigates the lands of the people who are "part of him". This means that there is a traditional informal agreement that certain well owners irrigate for certain people, and that landowners are not supposed to turn to another well owner, even if he offers him a cheaper price. According to him, they call that the "usual farms" (*Mazare3 mo3tadah*).

However for the Qassems, the traditional rule stipulates that water goes to Ala'awal be Al'Awal (First then First). This means that well-owners should irrigate for those who are closer to them before moving to those next closest and so on.

For land irrigation, all parties agree that the traditional rule is that for qat irrigation the profit is divided as follows: ¼ is for the water provider, ¼ is for land owner, and ½ is for the one who plants the seeds and guards the land. For corn, 1/3 of the crop is for the water provider.[84] This rule does not apply if water owners sell water for profit.

9.4.3 B: Conflict description

The conflict between Person 94 and the sons of Mohammed Qassem started in 2006. Both Person 94 and the Qassems are sheikhly families in the area. Person 94's family live in the Gulf (Saudi Arabia and UAE) and he lives with his wife and children in a small mansion. Person 94 himself is a smart young man (early 40s) with a degree in law and Shariah. In addition, he is an arbitrator and the principal of the primary school in the area. Person 94 has a well and he uses two pumps to pump water to the Qat farms. The land that he irrigates is not within the area of Halhala, but in Demnah.

Person 94's account:

Person 94 explains that the conflict started with Mohammed Qassem, the father, when he and his sons attempted to dig a water-well located higher in the valley than Person 94's. Person 94 shot at them to stop

[81] NWRA, Report on Halhalah on the Water conflict between Hassan Mohammed Qassem and Abdurazaq Obaid, February 17, 2014

[82] Meeting with Shaeif Addakam, district director of Demnad Khadeer, April 15, 2015, his office in the district.

[83] Meeting with Shaeif Addakam, district director of Demnad Khadeer, April 15, 2015, his office in the district.

[84] The FGD in Shararah, April 15, 2014; meeting with the Qassems, April 15, 2014

them from doing that. Nobody was hurt, but Person 94 took the case to the court that ruled in his favor. The Qassems then appealed against the court ruling at the Court of Appeal. The Qassems tried to dig two wells, one approximately two and a half kilometers higher in the valley than Person 94's and one that is only 40 meters next to his. Person 94 complained to the Water Resources Authority branch in Ta'izz (NWRA Ta'izz). They sent an enforcement officer (certified by the Prosecution) to look at the case on site. The Officer wrote a report and based on that filed a case with the prosecution office, who took the case to court again. In 2007, the court issued another ruling in Person 94's favor ordering the Qassems to bury their wells.

According to Person 94, the Qassems subsequently talked with some of their relatives in the Hazzah area who live higher in the valley and agreed to extend the water supply from their relatives' area to their own land, something he thought would cut off the water feeding his well. In 2008, Person 94 talked with the NWRA Ta'izz and filed another case against the Qassems at the court. The court issued an order to prevent any further activity regarding the digging of wells or the distribution of water that would upset the current arrangements. In 2009 the Qassems again tried to dig a well 40 meters away from Person 94's; he again proceeded to file court proceedings against them. The court ruled in his favor, making it the 5th court ruling he won against the Qassems in 2 years.[85]

The situation cooled down with no resolution until November 2013 when, according to Person 94, the Qassems established a water distribution network (pipes) from the source upstream to their land and to those of other people in the area. Person 94 again went to the court and the court issued yet another ruling to dismantle the water network that Qassems established. Furthermore, the court issued prison sentences against some of those involved.

Unhappy with all the court rulings and the NWRA in Ta'izz, the Qassems took the case to the NWRA in Sana'a. They sent an engineer who studied the situation, met with both sides, and came up with a report diagnosing the problem and proposing recommendations to solve it. Based on the report, the NWRA in Sana'a issued a letter addressed to the director of Khadeer district requesting that he, the judiciary and security authorities in the district considered the NWRA recommendations in order to maintain water sustainability and promote stability in the area. The recommendations included limiting transferring water to any area that is more than two kilometers away from the water source or water well, and to restrict the use of water for drinking purposes and for irrigating crops that need less water. It was also recommended to ban the digging of any new wells in the area, and to use modern irrigation methods for qat farming, rather than flood irrigation methods currently used.

Person 94 did not give up. He took the case to higher political levels and managed to obtain letters from the Governor of Ta'izz, the Minister of Water and Environment, the Presidential Office Manager, the head of Appeals court in Ta'izz, and the Attorney General. All those letters were addressed to the head of NWRA in Sana'a asking him to "refrain from opening new water conflicts" in the case of Halhalah conflict. According to Person 94, the NWRA's action had stirred the conflict. These actions makes it clear that Person 94 is a powerful man with lots of connections; he managed to obtain court rulings in a very limited time (5 court rulings in 2 years), which is pretty unusual in Yemen.

[85] This is likely a court corruption case. A constant remark in any other report about justice in Yemen is the delays. Courts take years to issue verdicts. Especially during 2011-2013 courts were closed about 40% of the time and almost not functioning so it is really strange that he was able to get 5 court sentences in 2 years.

According to the district director, Shaief Addakam, it is not right that Person 94 transfers water from the water source or well to other distant areas, when the people in his area are deprived of water. This practice is especially unacceptable for irrigation of qat farms, when considering the traditional rules. He also thinks that the contradiction between the NWRA Sana'a and NWRA Ta'izz decisions has caused a lot of confusion and helped to exacerbate the conflict.

The Qassem's account:
The Qassems are local farmers who rely mainly on farming for living. They mainly grow qat, coffee and corn, in addition to vegetables. The Qassems accuse Person 94 of exhausting water in the Halhalah area by pumping water down to Qat farms outside the area. According to them and to Person 94 himself, Azanni's well is 400 meters deep and uses two pumps to push water to farms outside the area 24 hours a day. The Qassems story was not very different from Person 94's, but they emphasized that they dug those two other wells because they needed drinking water and water to irrigate their own farms in the area of Halhalah. A farmer in Hazzah, an area higher in the valley, sells them water one or two days a week, depending on the demand in his area. He is committed to traditional rules, as he sells for people in his area before selling to others outside the area, in this case the Qassems.

They tried to convince Person 94 to keep the water for the people in the area, and suggested to buy it from him if necessary, but Azanni refused. They tried to convince him to sell them water two weeks in the month, and sell water to his other clients during the other two weeks, but also this was refused. According to them, Person 94 pumping the water to outside areas comes at the expense of local residents. "Those who benefit from his water are 4 to 5 qat farmers in the Demnah area outside Halhalah at the expense of over 4000 local Halhalis", said Abdullah Saeed.

In addition to rainwater, the Qassems and other residents in the area rely on two wells that they say have dried up because of Person 94's overconsumption. The situation got worse over the past three years because of did not receive sufficient rainwater. "Two good rains a year used to be enough, now 18 rains are not enough because of Person 94's overconsumption of water for commercial gain", said Abdullah Saeed. They say that they do not even have enough water for domestic consumption, let alone to irrigate their farms. Farms have gone dry affecting their income. Because of that the Qassems and others are no longer self-supporting and have to buy grains for consumption. "The women are used to bake corn, now they are learning to bake barely. This man forced us to go to the market after being self-sufficient", said Hassan Qassem.

The Qassems and other locals tried to protest at the local council member, but according to them they were thrown in jail because of that.

The Qassems see the case as a power exercise. They see Person 94 as a rich powerful person who has good connections with the government and who uses that to maintain his own interests in Halhalah, at the expense of others. They believe he has the money to buy off everyone: officials of the NWRA in Ta'izz, courts, the prosecution, and security. They said that the local council sympathized with them, but they did nothing to help. They also believe that the Deputy Governor is Person 94's friend who stands on his side, as Person 94 ran his elections in 2006.

The Qassems are wishing to adhere to the report of the NWRA in Sana'a, as they think it is a fair. They do not believe or trust anything else. "We are not going to courts and no government", they say. "There will be a time when we'll go thirsty and hungry and then we'll kill for water" they stressed.

Othmas Account (A resolved conflict?):

Abdussalam Othman is a local farmer who also had a dispute with Person 94. Othman irrigated water from his well up the valley to farmers in Halhalah. This water came from Person 94's well, right before the time when Person 94 extended his irrigation service to the other farms. Fearing that Othman's irrigation would affect the water levels of his well, Person 94 commenced proceedings against Othamn. During the process, the prosecution threw both parties in jail. Othman remained in jail for a week while Person 94, according to Othman, was released in a few hours.[86]

Othman said that the district director was unhappy that Person 94 was pumping the water to qat farmers outside Halhalah, while locals were deprived. However, just like the Qassems, Othman believes that Person 94 is a powerful man who has money to buy off everyone and get whatever verdicts serve his interests. He eventually gave up and accepted a settlement that they both agree upon. According to the settlement, Othman committed to stop transferring water to farmers in Halhalah. The settlement was written, signed by both parties and filed by the court. In return, Person 94 withdrew the court case.

Othman finds the settlement unfair, not only to him but also for those from Halhalah, who will be denied water to irrigate their farms. Nevertheless, he said that he did not have a choice. He requested a settlement because he could not stand up against such a powerful and rich man and he was worried that if he continued to challenge him, "they" will end up closing down his only well. By "they" he meant Person 94 and the court. "He got all the verdicts in the court in his favor with money. I saw him paying people in 500 Saudi Rial bills.", said Othman. NWRA told him that his pump does not meet the "standards" without explaining what those standards were. To him, it is shady since Person 94 is allowed to use two pumps and transfer water in large quantities 24 hours a day most of the time. The rest of the people in Halhalah were affected but, according to Othaman, they are poor people and would not stand by him against Person 94.

9.4.4 C: Dispute regulation mechanisms

Person 94 used the court repeatedly. His experience in law helped him. However, he also reached out to high-level government officials to intervene. The Qassems tried the court but they do not trust it. They say that Person 94 bribed the judge, security, prosecution and the officials of the NWRA in Ta'izz and cannot afford to compete with that. They only went to NWRA in Sana'a (see above), and no further follow-up actions have been taken

Both sides do not seem to trust tribal sheikhs. Azzan said that the Qassems might not trust a sheikh he chooses and the other way around. The Qassems also have an issue of trust with sheikhs and believe that most sheikhs are either uncredible or corrupt. "Is there such a thing as fair sheikhs in Ta'izz?!!", said Abdullah Saeed.

The conflict remains unsolved and the underlying causes that sustain it remain unaddressed.

According to Abdussamad Shuja, head of NWRA in Ta'izz, The law says that water should not be pumped out of the area, but the law is ambiguous about the distance that limits water transfer.

One of the Qassems brothers, Khaled Mohammed Qassem serves as Sheikh Dhaman. He resolves conflicts in the area. He issues verdicts and he has an official stamp. He is in his late 30s, younger than his other brothers, but he became a sheikh because he is more educated. Most of the problems he solves are marital problems and small disputes between families over children fights, inheritance, etc.

Person 94 himself is a sheikh and people come to him to resolve their problems. He also resolves inheritance problems, because he is a lawyer specialized in Shariah. He said he files his verdicts in the Qalam Alkuttab in

[86] The case-study researcher explains that courts and prosecutions are known for either being too weak or corrupt or both. The implication here by Othman is that the prosecution is corrupt and they treated him unfairely because they got a bribe from Abdurrazaq.

the court and that in rare cases parties appeal to it. In one case, they appealed his verdict and the Appeals court supported his verdict. This is, according to an interviewee, because he is well-trained and educated in law and Shariah and understands court procedures and rules. Sometimes, when he sees fit, he would talk to the court to try to resolve the dispute and the court agrees.

9.5 Case 9 - Qurada and Al Marzuaah village

9.5.1 Overview of the conflict

In 1997, a dispute over water arose between two villages. The story began in the mid-1990s, when one village – Qurada - received money from the Government's rural water supply agency to rehabilitate the village piped water supply system. This system was fed from their springs that flowed into a collection tank. However, the tank was situated uphill of a spring that belonged to a second village, Al Marzooh. Al Marzooh became afraid that the project would reduce the flow into their spring. The dispute lasted until 2001, left many dead, and had to be resolved in the Court of Appeal after the intervention of the army and the President of the Republic.

9.5.2 A: Context and contextual changes

The villages of Quradah and Merzah are located in the governorate of Ta'izz in the district of Saber Almawadem in the west part of Yemen. The population of Quradah is around 6000, the population of Merzah is around 1000 according to an NWRA staff report. The two villages are located on opposite sides of the wadi called Saylat Aloun. Here the mountain of Aloun is located with the springs over which the conflict arose.
The conflict between the two villages is on the share of the water produced by springs. The two villages mainly use the water mainly for drinking purposes and for irrigation. According to reports and from the interview the two villages have their own sources of water, each from specific springs that have been known to each other for dozens of years. This division was based on old rulings and courts judgments, the oldest dating back to 1002 by the Hegry[87] calendar, about 435 years ago. In the mid 1970s Quradah village had constructed a water collection tank and replaced the old conveying open canal system with steel pipes. According to all interviewees, they faced no objection or rejection from the Merzah people.

9.5.3 B: Conflict description

The recent conflict started in 1997 when the people of Quradah received assistance from the Government (rural water supply) to rehabilitate their water supply system, which included replacement of old and decayed pipes of the main supply system that were damaged due to floods over the years. The problem erupted during the contractor's work, when he constructed a wall barrier in the wadi at the side of Quradah to safeguard the pipes installation work. This was considered by the Merzah villagers as a way to stop the sub-surface flow from the upstream springs to reach their springs in the downstream of the wadi and consequently would lead to their springs drying up, causing the loss of their water sources. As a reaction, the people of Merzah started to shoot with firearms against people of Quradah and destroyed the new pipes system. They continued these actions, even with after the local authorities intervened and attempted to solve the problem. Later on, the people of Merzah blew up Quradah's tank . The two villages started to fight, resulting in deaths and injuries of both parties, a blockage on both sides of the main road in the district. Some of the shakies and dignitaries of the area tried to mediate between the two sides but without any success[88]. The Governor of Ta'izz at that time, Al-Hajre, selected two judges to investigate the case and make recommendations to solve the problem. He would then issue an administrative order to implement it, and after that, the two sides (Quradah and Merzah) could refer their cases to the court for a final judgment. However, the proposed solution was

[87] Islamic calendar 1435 hegry=the year 2014
[88] Reference to the House of Representative Committee report 1999.

rejected, with both parties shooting at the committee who tried to implement the recommendation (more detail in the above reference).
The proposed solutions of the committee were:
1) To restore the Quradah system as it was without any extra sources from other springs which were not initially diverted to the Quradah tank (not accepted by Qurdah as they claim their ownership of other springs in the area); 2) to divert the spring called Anazeha in the upstream of the wadi to supply Merzah village (this was refused by Quradah as this spring is theirs and Merzah has its own springs in the downstream area of the wadi); 3) that Quradah requested an official document to state their ownership of the spring (Anazeha) and that it will only lend water sources to Merzah without if Merzah did not ownership of Merzah of that spring.

In 1998, a unit from the army located in the area was requested to intervene to stop the fighting, to restore the peace in the area and to assist in the implementation of the solution suggested by the committee that the governor of Ta'izz had previously created. However, a convoy from the army and security force accompanying the implementation committee was subjected to gunfire from the Quradah side, as they felt that the commander of the army unit was taking sides with Merzah. This resulted in fights between Quradah and the army, killing three soldiers and injuring 20. The army unit took over the Quradah village and some houses were looted. Furthermore, the security forces arrested some of its residents and sent them to jail. Local media, the private press and local dignitaries protested against the action taken by the army. As a result, a committee was formed from the House of Representatives to investigate the event and report back to the General Assembly of the house (a copy of the report is attached).

In the 1998 the Government assigned a committee with judge Aqabat, chairman of judiciary, and Dr. Rashad Alalem, head of the security forces in Ta'izz, to solve the problem. The ruling of the committee was to collect all the water from the five springs in one tank and to connect the tank with two separate outlet pipes: one for Quradah of four inches diameter, and another for Merzah of two inches diameter. That meant that 2/3 of the water supply went to Quradah, and 1/3 to Merzah. The representatives of Quradah refused the ruling, as they claimed ownership over the five springs, and refused to sign the ruling document at that time.

During the visit of the previous President Saleh to Ta'izz in 2001, he requested the attendance of both sides to hear the claims. After that he called representatives of Quradah and Merzah to the presidential palace and forced them - a statement made by by Kaled Shoug, citizen from Quradah and a staff member of the NWRA - to accept the ruling and to sign the ruling document in order to end the conflict and to restore the peace in the area. Though the representatives of Quradah signed the ruling document in 2001, they never accepted the ruling since they felt that they were forced and their rights had been taken from them by force.

In the year 2011, which was the year of the revolution in Yemen against the regime of president Saleh, the enforcement of the law was weak and sometimes absent altogether. In that year, the people of Quradah decided to take control and to regain, what they claimed to be, their rightful ownership of the springs. They diverted all the tank water to their side and left the Merzah village without water from the tank, claiming that the people of Merzah had control over their own resources from the springs downstream. The Merzah people considered this as an act of aggression and started to shoot towards Quradah, which resulted in exchange of gunfire between the two villages, killing two persons and injuring many more from both sides. The Governor of Ta'izz with some Sheikhs from the area intervened and decided to add a pipe of ½ inches to Merzah from the springs of Quradah in addition to what they already had. However, this did not solve the problem and due to the loss of control by the government and the weak enforcement by security forces, the fighting continued between the two villages and resulted in the death of 16 persons and injured more from both sides. The total number of people killed from both sides currently stands at 17 and the total number of people injured is 80.

These are number since the start of the conflict in 1997 until April 2014. Also the number of the people killed 17 and 80 injured from both sides of Quradah and Merzah since the start of the conflict in 1997 until April 2014. Also three people of the army and security focre were killed and another 20 were injured.

9.5.4 C: Dispute regulation mechanisms

Several attempts were made to resolve the conflict:

1. The Governor of Ta'izz selected two judges to investigate the case and make recommendations to solve the problem and to facilitate a judicial solution to the dispture. Both parties rejected this solution. A unit from the army was then requested to intervene to stop the fighting and assist with the implementation of the solutions proposed by the committee, but this also failed.
2. In the 1998, the Government assigned a committee to solve the problem. They came up with a practical solution to divide the water from the five springs to both villages. All of the water had to be collected in one tank, after which the water would be divided between two separate outlet pipes: one for Quradah of four inches diameter, and another for Merzah of two inches diameter. Accordingly. 2/3 of the water supply went to Quradah, and 1/3 to Merzah. The people of Quradah rejected this solution, as the claimed ownership over the five springs.
3. President Saleh intervened during his visit to Ta'izz in 2001. He requested the attendance of both sides to hear their claims, and after that he forced both sides to accept the earlier described ruling of the Governmental Committee. This ruling lasted until 2011, the year of the revolution, when the people of Quradah decided to take full control again over the springs. This was possible due to the lack of law enforcement.
4. In the period from 2011 and onwards, the Governor of Ta'izz together with some Shaikhs from the area intervened in the conflict, also suggesting a different division of the water by adding a pipe of ½ inches to Merzah village from the springs, in addition to the pipes that already existed. This solution also failed.

9.6 Other known conflicts in Ta'izz

9.6.1 Case 10 - Experiences in Al-Maafer district

Meeting with Local Council in Al-Maafer district
Date of interview: April 16, 2014
Participants: District Council Facility- Alma'aafer district
Participants: District director, general secretary of local council, local council members, local water officials, civil society representatives and individuals affected by water conflicts

Random Well drilling

- Wells are 200-300 meter deep in the district.
- Water drilling occurs both manually and by means of drillers. Drillers have to obtain permission from NWRA before they drill. Manual drilling is unregulated. The problem with manual drilling is that it is unregulated and it happens a lot at the village level.
- Conflicts happen mainly because of well drilling whether for agriculture or drinking use. Since 2011, problem of random well drilling increased rapidly, many times without permission. That caused conflicts and some of these conflicts were about to turn violent but with efforts from some sheikhs and locals some of them were resolved or rather put to sleep for the time being.
- Drilling happened 'randomly' and intensively. In an area one-tenth of an acre, there are 5 wells.
- Drilling happens in protected areas.
- Sometimes NWRA issues permissions/licenses for drilling without examining how that will affect existing water infrastructure and projects.
- NWRA's role is unclear. According to the Almaafer district director, those affected by water conflict have complained to the local council, but the local council has insufficient technical support from the Government. "Too much centralization is what made things worse. Digging a surface well takes 5 days. By the time, the complaint is processed through government bureaucracy, if any, the wells are already dug and in use", said Abdullah Assarari, Almaafer District Director. He suggested that the NWRA opens local offices at the district level to work with local councils on these issues. These local offices should be provided with sufficient capacity to respond to problems and work with district authorities and security to intervene.[89]

Qat and extensive transfer of water for irrigation

- Participants overwhelmingly agreed that Qat is the major threat to water and the cause of most water conflicts. Water is being pumped for commercial uses either for qat irrigation or for drinking to areas outside the district.
- Transferring water to areas outside the district for Qat irrigation. Pumping happens 24 hours a day throughout the summer and that affects ground water. "If pumping water continues like this, there will be a time when we run out of water and become displaced", said Mohamed Numan, Aljebzah water project manager.

[89] Meeting with local councils leadership and local leaders in Alamaafer District, April 16, 2014, Almaafer Ta'izz.

- In the districts of the Annashamah area, some locals complained to the local council that certain individuals have rented their lands to people from outside the area to grow qat. Those qat traders come from Mawyah district where water wells and sources have dried up due to qat irrigation.
- Farms that used to grow vegetables and fruits have died because a qat "businessman" from Dhalee governorate rented a plot of land and used the water to irrigate his qat instead.
- Water is pumped/transferred kilometers away.
- More than 80% of water wells have dried up since 2005 due to the lack of rain and overuse of water.

Laws and Urf

- Laws are unclear, ambiguous, and weak. Moreover, enforcement is difficult, as the judge does not have clear laws that he can rely on.
- There are no traditional rules to regulate water use. Privately owned water sources are totally unregulated.
- Due to its destructive impact on the ground water level, the General Secretary of Almaafer suggests a new law that would prohibit the use of water to irrigate Qat.

Law enforcement

- Law enforcement authorities are totally ineffective.
- According to the security officer who attended the meeting, the authorities arrest those involved in violations and refer to them to the prosecution service, but the prosecution service does not proceed any further.
- The security services arrest individuals, bury illegally dug wells etc. However, they sometimes face resistance from locals. "Without cooperation from the community it is very difficult for us to do our work", according to a security officer.
- People go to local councils and security to complain about water issues. Neverthless, they also resort to informal peaceful settlements, because law enforcement is ineffective.
- Some influential people intervene and allow the digging, mostly to benefit those they know.

Water conflict stories

- In Aljebzah there are two wells, one dug by locals and the other one by the local councils and both are about 20 years old. Recently, some locals commenced digging tens of surface wells (about 60 meters deep) surrounding the two original wells. As a result, one of the original wells went completely dry and the other one was reduced to less than 50% during the non-rainy season.
- In Aleliyani, Aljebzah, there are 130 wells in a 200 square meters piece of land.

Who is Affected

- Local people who lost access to water both for drinking and home consumption, as well as for irrigation of their farms were impacted. In some areas, people are struggling to find drinking water.
- Qat farm owners who receive water benefit, but also those who sell water in large quantities to qat farmers made huge profits.
- Water projects (government and private) for home consumption have been affected by random drilling.

- Most people have now resorted to buying truck water for home use. A truck of water of 4,000 liters costs YR 5,000 but sometimes as much as YR 7,000, which can be enough for a medium sized family for a week, but is very expensive by Yemeni standards.

9.6.2 Case 11 - Al Hayma

Overview of the conflict

In 1987, and as part of an emergency drilling campaign to rescue the city, the NWSA started drilling new wells in the Lower Wadi Al Hayma, four times deeper than the ones they had drilled in 1982 with a maximum depth of 500m. However, the villagers were refused permission to deepen their own wells. The locals stopped the city's drilling rigs by force of arms. The army came; the village men took to the hills with their arms; and five sheikhs were put in prison. Eventually, a minister came down from Sana'a and brokered a settlement. The sheikhs were released after they had signed an agreement not to stop the drilling (Mounch, 1997). By 1992, the villagers' wells were dry. They took up arms again and disconnected one of the water supply wells. Twenty truckloads of soldiers moved in. The President of the Republic intervened. The villagers were obliged to surrender their claims.

Context and contextual changes

In 1976, the Government conducted investigations of the groundwater aquifers in the Ta'izz area, and the Al Hayma aquifer was proven to have significant potential. The main objective of the investigations in Al Hayma was to supply the city of Ta'izz with water. The engineers and scientists had neglected to inform the farmers and stakeholders about the purpose of these investigations (Mohieldeen, 1999) In 1982-1983, the NWSA started the commissioning of wells. Some locals thought that the NWSA would drill only seven deeper wells in the area, yet now there are more than thirty. The farmers had been informed that pumping water from the deeper wells drilled by the NWSA, and its transportation to the city through the pipeline, would affect neither their shallow wells nor their farms, due to the presence of an aquiclude between their wells and the NWSA's wells. The NWSA promised $10 million compensation for loss of crops. However, the sheik of Lower Wadi Al Hayma, the late sheik Sadiq, who agreed to the drilling, managed to get three deeper drilled wells for himself out of the deal (Handley, 2001). Four years later, the shallow wells of the local population in Lower Al Hayma had almost dried up. The water level in the aquifer had been depleted dramatically, because of the unsustainable pumping of water exceeding the sustainable yield of the aquifer. The lower part of the wadi was left barren, apart from a few fields including sheikh Sadiq's successors fields, which were irrigated from his deeper drilled wells. To date nothing has been received from the promised $10 million government compensation. (Mohieldeen, 1999)

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By 1992, the villagers' wells were dry. They took up arms again and disconnected one of the water supply wells. Twenty truckloads of soldiers moved in. The President of the Republic intervened. The villagers were obliged to surrender their claims (Mounch, 1997).

9.6.3 Case 12 - The Habir case

Conflict surrounding urban water sourcing with rural areas.
In 1992 villagers in Habir discovered that their area had been proposed as the next source of water for Ta'izz city. They had seen the impact of water transfer on the neighboring valley of Al Hayma so determined to resist. For three years, they succeeded in postponing the project. When the rigs finally arrived in April 1995, the Habir villagers drove the drillers off the site by using petrol torches. Their sheikhs were imprisoned. Eventually**,** a "compensation" package was agreed upon, so the villagers allowed the drillers in. However, within a short period of time another farmer's shallow-well dried up. When he was refused permission to dig a new, deeper well, the villagers again stopped the drilling for Ta'izz. When the army arrived, the women and children threw stones and tried to disarm the soldiers. The soldiers fired, and two women were seriously injured. Eventually, the wells were drilled, but with a legacy of distrust and anger that persists to this day (World Bank, 1996)

9.6.4 Case 13 - Mokbel versus Owen

A well-owner named Hassan Mokbel and his son transfered their well water to another well-owner near Al-Horor area for the purpose of selling the water to the people of Alhoror, thus violating the agreement of non-transfer of water from one location to another for the purpose of selling. Another citizen, Abdul Razaq Owen, brought this case to the authority, which has since ceased this action in December 2013. The case is still under investigation.

9.6.5 Case 14 - The dispute between Al Kareefah and Al Dhunaib village

In the very water-scarce Qadas area of the Ta'izz Governorate, al Kareefah and al Dhunaib are neighboring villages. Each village has its own potable water scheme with its own management committee. Having seen the problems of water scarcity in other parts of Qadas, the two villages cooperate to protect the drinking water resource, which is their first priority.
The committees keep an eye on the activities of local farmers and have stopped the digging of many new wells. Armed with a permit from the NWRA branch office in Ta'izz, one al Kareefah farmer started to drill a new well. The al Kareefah water management committee entered an objection with NWRA, which then cancelled the permit. Another farmer, this time from al Dhunaib, failed to obtain a permit, but started to dig a well anyway, stealthily and by night. By the time the village discovered the activity, the well was more than 20 meters deep and lined with reinforced concrete. The farmer threatened to kill anyone who came close. The al Dhunaib water committee chairman convened a meeting for the whole community, and it was decided that the well should be filled in. Faced with this community solidarity, the farmer had no choice, but to agree. The whole community took part in filling in the well. Ironically, the committees had the most problem with the official rural water agency, the General Authority for Rural Water and Sanitation Projects (GARWSP). GARWSP started to drill a borehole in the catchment area of the existing drinking water schemes of both villages, and within 400m of an existing well. The committees pointed out to GARWSP that this proximity violated the 500m *harim* rule. Their protest fell on deaf ears. The two villages were on the point of resorting to violence to stop the contractor when it was learned that the new well was dry. GARWSP made a second attempt to drill, this time within 200m of the water source of al Kareefah and in the direct catchment area of Al Dhunaib's water source. This second attempt was met with armed resistance from both communities, and the contractor was forced to leave the area. The two committees then decided jointly to hand-dig a well for community use at the new site to prevent GARWSP from any future attempt to drill in this location. (Al-Shaybani et al., 2005)

9.6.6 Case 15 - Water quality in Ta'izz city

Highly unreliable water supply and quality services

Two parties dominate the market for drinking water in Ta'izz city: Ta'izz Water & Sanitation Local Company (TWSLC) and the private market. However, according to a study of Koop (2008) the water quality and supply is highly unreliable. According to Koop (2008) many departments within TWSLC are unable to perform as is desirable. Koop (2008), who concentrated in his study on the quality department, found out that a long-term vision with goals and milestones in the quality department is completely absent. Moreover the ability of employees to react to operational affairs is weak. Operational tasks are hindered by insufficient availability of materials and equipment, replacement of worn-out parts cannot proceed and imposed quality regulations are not being followed by TWSLC employees. Furthermore the addition of chlorine is unreliable and, besides poor work ethics, a portion of the workforce is unqualified for the tasks they have to perform.

Households regard TWSLC's service to be of inferior quality and are highly displeased with its limited availability for one period of three days every month per household connection. TWSLC customers only use piped water for household purposes and not for consumption. The private sector in Ta'izz has taken over the supply of drinking water. In the private sector, tank trucks transport the water from the treatment location to the shop. The customers fetch their water in recycled bottles or jerry cans in the shop (Koop, 2008).

Overall, there is no guarantee of clean and safe water. According to Koop (2008) the inability to reduce time between the point of supply and consumption and the inability to apply adequate hygiene practices are the most important causes for insufficient incorporation of microbiological water quality. Furthermore, customers prefer water without chlorine and seem to be unaware of increased risks for microbiologically contamination.

Also the Vitens-Evidens International (VEI) project, which started mid-2006, has not yielded the intended results. The project goal was to develop TWSLC towards a sustainable healthy company that is able to operate by self-generated financial resources. Although a new organizational structure has been implemented on behalf of VEI, it has not been accepted company-wide and enforcement is lacking strength. Training of employees is incidental and on the job training has not been executed for the present. Large efforts are still needed to improve the transparency of the financial structure of TWSLC since current results are minimal (Koop, 2008).

Unequal water supply by water tankers

The tankers provide between 30% of the lowest income groups and 55% of the highest income groups of the city with water. A major issue with the tankers is the water quality. Apart from incorrectly informing the customer as to where they get the water from, tankers have been observed emptying cesspits and dumping it in the nearest wadi. Whether they are cleaned out before delivering the next load of water is unknown. Although they are supposed to be cleaned out regularly, drivers often bribe the municipality inspectors not to bother them (Handley, 2001)

In the rural areas, farmers requiring water may purchase it from adjacent well-owners, or purchase tankers from farther afield to apply it sparingly to the highest value crops such as qat. The cost is huge, and farmers

are charged more—more than $1/m3—if the crop is qat. The fact that well-owners sell at low prices to neighbours for agriculture and at much higher prices for the tanker market does seem to reflect the recognition of the traditional principles of local cooperation regarding water (Mounch, 2007).

Pollution due to non-treated waste water

The population growth, municipal and industrial activities in Ta'izz city have resulted in the increasing deterioration of the water quality, especially in the shallow groundwater aquifer, which represents the principal groundwater resource in the area. Nearly 5 million cubic meters per year of untreated wastewater is discharged into the basin system through the septic tanks, stream channels, sewage lagoons and industrial bonds (Farag et al., miscellaneous)

The sewage from urban domestic wastewater in Ta'izz city is not properly treated, which causes a polluted environment in and along the wadis downstream of the Al Burayhi lakes. Something very similar is happening in the industrial zones. Most of the industries in the Ta'izz area produce waste water that is severely contaminated – although it is still generally unknown which contaminants occur and in what concentrations. Re-use of the treated waste water by the same industries should be encouraged to ensure that contaminants are confined inside a limited area and to salvage industries from claims and allegations (Van der Gun & Riaz, 2004). Further construction of a treatment plant for municipal and industrial waste water, rebuilding the sewage system for the city, enforced watershed protection regulation is recommended (Farag et al., 2013).

9.7 Overall analysis Ta'izz case studies

The cases studied in the Ta'izz area illustrate that water disputes occurring due to random well-drilling and the transfer of water from one area to another for qat irrigation. The cases studied indicate an alarming increase in disputes regarding water over the past three years. Interviewees, including conflicting parties, overwhelmingly agreed that lack of rain and the deterioration in Governmental function, as well as the security situation over this period have triggered the conflicts.

The conflicts are a manifestation of a series of structural factors that reinforce one other. This includes population growth and competition over increasingly scarce water coupled with a lack of informal and formal traditions to regulate water use. Poor Government capacity, lack of coordination between central and local government authorities, centralization, ambiguous laws, and lack of policies to address water problems are also key factors.

All interviewees agree that the problems escalated because of overconsumption of water to irrigate qat farms. They all agree that qat is a major problem threatening water resource in their areas. In the absence of clear regulations for water use and enforcement of these regulations, disputants seem to be stuck in a cycle of competition for water. Those who need water for drinking and home use, particularly ordinary citizens, seem to be more vulnerable, compared to those who arewell-connected to power holders. The latter group actually seems to benefit from it.

Attempts to resolve the conflicts by Government authorities are temporary, *ad hoc* and coercive in nature. The root causes of the conflicts remain completely unaddressed. According to the general secretary of Almaafer local councils: "Water disputes are sensitive and they escalate too quickly. Disasters are coming our way if nothing is done about it soon".

Role of women

In all cases from Ta'izz area the field researchers observe a general pattern of women who have no specific rights when it comes to water. This is in stark contrast to the fact that women have more responsibilities than men when it comes to water. Women are responsible for securing water for home and drinking use. During droughts women need to travel long distances to fetch water, sometimes using donkeys and most of the time carrying water containers themselves. Women also help work and fertilize the land, remove grass, pick the crops, and clear the land. "Women are water slaves. They fetch water all day", said a local participant in Almaafer district mentioning the story of two women who were drifted by rain and died while bringing water from the Wadi.

Qat

One of the major factors in the conflict is the cultivation of Qat, a cash crop that is known for its high level of water consumption. Commercial use of water for qat farming, and competition to use it for that purpose for quick financial gain, has increased dramatically leading to random well drilling. Although random well drilling existed before, it has increased at an alarming rate over the past three years.

As qat growing causes depletion of water supplies, qat farmers move to new areas where they have access to water to irrigate their crop. According to the Alma'afer District Council, qat farmers from Maoyah, a district that is famous for its good quality qat in Ta'izz, have already started moving to nearby districts after their farms grew dry in Maoyah.

Institutional capacity

The NWRA in Ta'izz does not seem to have much power or capacity to intervene. In the case of the Halhalah conflict, Abdussamad Shuja, the head of NWRA in Ta'izz, indicated that Person 94 is a powerful man, well-connected and experienced in Shariah. Furthermore, the courts allowed him to construct matters in his favor. The NWRA's role is limited to sending "enforcement officers" to study conflicts and refer cases to courts. NWRA has 5 lawyers on staff who follow up on specific cases in prosecution and courts. Apart from that NWRA is not able to do much[90].

NWRA indicated a problem in enforcing court sentences, but maybe more importantly, NWRA's ability to address or at least lead an effort to address the root cases of conflicts over water is limited by small budget allocations, poor legislation, and lack of cooperation from local and district authorities. Most of the time, the NWRA tries to broker peaceful resolution/settlement informally among locals that, in the opinion of the Head of NWRA in Ta'izz, does not put an end to conflict.[91] Although peaceful settlements are not perfect and do not resolve the root causes, they sometimes prevent the conflict from escalating. "Twisted peaceful settlement is better than functioning Shariah" is a local saying. This saying indicates how little trust people have in government and rule of law.

One of the problems that were brought up is that NWRA's immediate reaction is to issue "stopping orders", meaning orders to prevent any water related activities that are being disputed. This most of the time happens without proper investigation and examination of the problem or who is affected.[92] In the case of Halhalah, for example, this pushed the Qassems to resort to NWRA Sana'a for help.

Governance problem

There is a tremendous poor level of management with a clear disconnect between district level authorities, governorate level authorities and national level authorities.

NWRA Ta'izz complains that there is not enough support from the central Government. Budgetwise the allocations are too small and will not even cover the basic functions NWRA is required to perform. For example, the budget includes only 10,000 (less than $50) a month for gas.

The NWRA's role is unclear. According to the Alma'afer District Director, those affected by water conflict complain to the local council, but the local council is left with insufficient technical support from the Government. "Too much centralization is what made things worse. Digging a surface well takes 5 days. By the time, the complaint is processed through government bureaucracy, if any, the wells are already dug and in use", said Abdullah Assarari, Almaafer District Director. Lack of a process created conflicting reactions sometimes within the same government organization. NWRA Tai'zz and NWRA Sana'a not only were unable to communicate with each other regarding the Halhalah conflict, but they took two separate actions. This caused a great deal of confusion and has the potential to harden conflicting sides and contribute to the exacerbation of the conflict. In the absence of governance and poor enforcement, it seems that "survival of the fittest" is

[90] Interview with ABdussamad Shujaa, head of NWRA Ta'izz, April 16, 2014, Ta'izz.

[91] Interview with ABdussamad Shujaa, head of NWRA Ta'izz, April 16, 2014, Ta'izz.

[92] Meeting with local councils leadership and local leaders in Alamaafer district, April 16, 2014, Almaafer Ta'izz.

becoming the rule. One of the issues that was raised is NWRA's issuing permission to drillers' owners (private individuals who run the drilling business) without reverting to the district and local council authorities.[93]

Law

The problem is not only a lack of law enforcement, although that is an important part of it. The law is ambiguous and full of loopholes. For example, the law indicates that water cannot be transferred outside a specific area unless for drinking use. Shuja, head of NWRA Ta'izz, finds it difficult to monitor these kinds of water transfers, which are subject to manipulation given the current circumstances. Punishments in the law are either not strong enough, or subject to different interpretations by law enforcement offciers, to prevent people from committing violations. For example, the law says that a punishment indicates a fine that is "no more than" or a prison sentence that "does not exceed". Shuja thinks that it should be rather "no less than" and leave it to the court to determine the punishment.

Alternative Dispute Resolution

Informal dispute resolution mechanisms are weak and ineffective. There is a lack of understanding of traditional rules that regulate water use, particularly for irrigation.

Further recommendations for Ta'izz

- There needs to be clear regulations for the distance to which water can be transferred outside the original water source, in particular for water used for irrigation purposes. These regulations should include the distance to which water can be transferred and the quantities of water allowed to be pumped out for that purpose.
- A strategy or manual should be developed that outlines practical first responses to disputes concerning water. It should be drafted with participation from NWRA Sana'a, NWRA Ta'izz, the Governor's office, district directors, district security directors, prosecution officers, local judges and user groups. In addition, Akels and other informal actors involved in resolving local conflicts or in regulating water use should be involved. As part of the proposed strategy or manual, a clear communication system needs to be drawn among the different government entities involved.
- Locals do not seem to have an understanding of water use regulations. There needs to be some awareness campaigns to improve their understandings of the law and of issues that can result from existing water consumption practices.
- To improve governance, it is suggested that NWRA opens or strengthens local offices at the district level to work with local councils on these issues. These local offices should be provided with enough capacity to respond to problems and to work with district authorities. Also the provision of security arrangements (i.e., with support from policy or military personnel) is needed to intervene.

[93] Meeting with Shaeif Addakam, District Director of Demnad Khadeer, April 15, 2015, his office in the district; meeting with local councils leadership and local leaders in Alamaafer district, April 16, 2014, Almaafer Ta'izz

Chapter 10. Findings

Water governance and management is characterized by complexity and uncertainty. Water issues are complex due to their intricate coupling with multiple issues within the natural and societal domains. For example, the use of groundwater resources in Yemen is strongly interwoven with the (lack of) available surface water, fuel, social fabric (e.g., ethnic composition, wealth, education level, employment rate, and existing norms and values), and weak governance capacities. Additionally, water management must take into account issues related to uncertainty, nonlinearity and feedback. Uncertainties related to conflict and/or cooperation over shared water resources are of a diverse nature. It may entail unpredictability of developments (e.g., climatic, demographic, economic, or political), incomplete knowledge, ambiguity or conflicting views on the seriousness of a problem, its causes and potential solutions. Today, uncertainties related to water resource management are on the rise since the pace and dimensions of changes (e.g., climatic, demographic) are accelerating and are likely to do so even more in the future.

Water scarcity in Yemen is a security threat. Each year 2,500 people die as a result of a water-related conflict, according to unpublished estimates. Therefore, prevention and adaptation strategies are needed for the local, regional, and national level that are based on a robust understanding of the various sources of insecurity, their interdependency and cumulative conflict potential.
In practice, water-related conflict resolution is mostly the outcome of processes of negotiation, mediation and conciliation that are rooted in an in-depth understanding of the social/cultural/economic conditions and political contexts. Change is often only possible by means of constant negotiation and renegotiation between the many stakeholders at different levels.

10.1 About the research

The conceptual chapter presented an analytical framework to analyse the political economy and the conflict dimensions of water management in Yemen, as structural guidance for the field research and subsequent analysis. The key components in this framework, based upon a number of existing frameworks and proven concepts, are: (1) Context and contextual changes: How are the conflicts embedded in the local physical, socio-economic, political and legal-institutional structure, which lessens, intensifies, shapes and distributes the conflict? Have contextual changes triggered or caused the conflict? (2) Stakeholder analysis: Identification of the practices, interests and influences of the involved actors: who gets what, when and how? (3) Dispute regulation mechanisms: Which solutions are tried and why?

The resulting analytical framework has been used to answer the key questions of the research: (1) What is the interest of each stakeholder involved in the emergence of water-related conflicts? (2) Which mechanisms (formal and traditional) are used for preventing or resolving conflicts in land and water management? and (3) Are these solutions part of existing practices being used or of new arrangements being established?

Research was subsequently undertaken on (a) competition over groundwater in highlands (Sana'a basin); (b) conflicts over surface water in ephemeral rivers (Wadi Siham); (c) peri-urban competition (Ta'izz). Based on the knowledge of local contacts we identified several water related conflicts within these areas:

- For Sana'a: Shahik dam, Arrowdah, Bani Matar
- For Wadi Siham: Hodedah/ Al Dabashiah canal project, Bani Swaid
- For Ta'izz: Al Hayma, Qurada and Marzuaah, Bani Yusof, Al-Horor

In this chapter, the findings from the stakeholder consultation meeting will be presented together with the findings from the desktop and field research. The full report of the stakeholder meeting is included in the annexes.

10.2 A: Context and contextual changes

The conflicts are a manifestation of a series of structural factors, which include the increasing competition regarding scarce water, due to population growth and qat plantations, coupled with poor governing capacity. Against this backdrop, acts by individuals or groups can easily trigger new conflicts or intensify existing conflicts.

10.2.1 Social and physical conditions

Yemen is facing challenges of increasing population growth, prevalent poverty and the lack of availability of water. This leaves Yemen vulnerable to the impacts of climate change and prone to conflicts between water users. Water-related challenges (both in terms of quantity and quality) linger and threaten to undermine any socio-economic development made. The agricultural sector consumes a high proportion of the limited rain-, ground-, and (spate) floodwater available and is highly inefficient. The Yemeni Government faces major obstacles in providing safe and secure water to larger segments of society. The security situation and also impacts on the hard and soft infrastructure, through which, together with the lack of water, farmers find it difficult to sell their agricultural products to the markets for a reasonable price. The diesel price, for example, affects the viability of irrigated agriculture.

> "There is simply no water. The conflicts over water are a phenomenon, they are not the root problem."
>
> Participant consultation meeting, Amman, 2014

Many Yemeni worked abroad to strengthen the livelihood of their families through remittances, specially in Saudi Arabia. Many were employed as workers in the oil industry, but as a result of various political problems between the countries, the workers were expelled from Saudi Arabia. Unemployment contributed to the grievances of the population (Van Veen, 2013), leading to a situation where young people were willing to join Al-Qaida (AQAP) as it offers 'better' prospects for the future.

New conflicts also arise between oil companies and citizens. Citizens are denied access to water resources, as oil companies use the water to pressurize the oil reservoirs in order to be able to extract the oil. This consequently leads to significant pollution of the ground and surface water.

> "Qat farmers from Maoyah, a district that is famous for its good quality qat in Taiz, have already started moving to a nearby district after their farms grew dry in Maoyah."
>
> Interviewee District council of Alma'afer in Ta'izz

The overpumping of groundwater in coastal areas has resulted in salt water intruding in the fresh water aquifers; this process is very difficult to reverse and is damaging most crops and, therefore, the economy.

One of the major escalating factors in the conflict is the growth of qat, a cash crop that is known for its high level of water consumption. Commercial use of water for qat farming has increased dramatically. This has led to a number of problems: (1) the competition to use it

for that purpose has lead to 'random'[94] well-drilling. Although random well-drilling existed before, it increased by an alarming level and became a phenomenon over the past three years. (2) When aquifers become depleted, qat farmers move to new areas to irrigate their crop. (3) The benefits of qat are skewed; those who need water for drinking and home use, particularly ordinary citizens, seem to be affected more by this situation. Those who are better off and well connected to powerholders seem to benefit from it.

10.2.2 Traditional water access and distribution rules

Yemen has a long history of suffering with water scarcity, which laid the foundation for the agricultural norms and traditions to regulate water distribution, maintenance of the irrigation infrastructure, and dispute resolution mechanisms. In the researched areas, the people mainly rely on traditional rules (Urf) and other agreements to regulate the rights and restrictions with regard to water access, use and distribution. These rules are unwritten and are specific to the areas covered by the assessment since there may be other rules outside these areas. The rules specific to this assessment concern three sources of water.

Surface (flood) water: There are restrictions concerning the distribution of water, but they are in many cases out-dated as they do not accommodate for the presence of permanent structures (check dams) and the impact of these structures on groundwater recharge and hence the availability of drinking water.

"Water in general is subject to public ownership, everyone can use it."

Participant consultation meeting, Amman, 2014

Groundwater: Historically, for groundwater rules are not specified, though in several cases a distance rule is used, which is specified in the Water Law as a distance of minimal 500m between wells. In some cases some new informal rules have developed, for example regarding the purpose for which the water may be applied, who is allowed to use it, and embargo zones.

Subsurface flow: Subsurface flow is the water in-between the surface water and the groundwater. Any physical interference, for example through the construction of impermeable structures in ephemeral streams, may have a large impact on the available surface and groundwater downstream. Nevertheless, this source is often overlooked and consequently, no formal water rights or allocation rules have been formulated for subsurface flow.

The traditional rules with regard to water access rules are summarised in the table below.

94 While the word 'random' is often used to illustrate the vast spread of groundwater pumping, it is of course not random at all: farmers are well aware of the best locations to drill a well.

Table 10.1: Traditional water distribution rules (*Urf*)

Al Ala Fala'ala, or Al'ala Bel Al'ala	Supreme to the High: Surface water flood flow: It stipulates that land upstream has the priority of water use, then areas which are situated lower, all the way to the lowest level of the stream. Despite its geographical dimension, new users upstream do not automatically gain priority in water use, as prior appropriation is also to be respected.
Al Awal fa Al Awal	Who settled first has the first right to irrigate from the flood despite the location of his land.
Ala'awal be Al'Awal	The traditional rule stipulates that water goes to Ala'awal be Al'Awal (First then First). This means that well owners should irrigate for those who are closer to them before moving to those next to the ones closer to them and so on.
Al-Mosha'aa	This refers to land that is respected by locals as public space for everyone's use including grazing and water usage.
Alaqrab bel Aqrab	The closer then the close: which means that those close to the water source have the priority. The traditional rule also says the priority should be given to drinking water then irrigation
Mubah	According to the Islamic cultural tradition, water is considered to be a free natural resource, an open access resource or ''Mubah'', which means: permissible, also allowable, free available for all. But the religious teachings have also repeatedly emphasized to make judicious use of it. In semi-arid zones, where water resources are, in any case limited, it is, however, very hard to convince people, that a natural good perceived as God's "gift" should be restricted. (http://www.yemenwater.org/wp-content/uploads/2013/03/Negenman-T.-2000.pdf)

10.2.3 Formal water related legislation

Absence of regulation and enforcement

Conflicts over water are one of the main causes for tribal conflicts (as well as acts of violence, revenge, and tribal wars). The Yemeni judiciary has been marked with an ineffective role in resolving such disputes over the past three decades, that is, through the weakness of the law's authority. In addition, the lack of governmental power created a state of distrust, which leads to a stronger role of the tribal customs in the regulation of agricultural water, as well as the settlement of a large percentage of disputes in accordance with those agricultural norms.

According to the participants of the stakeholder consultation meeting, Islamic Shari'ah is the source of all legislation, but it provides only general guidelines. The Islamic jurisprudence is manmade so there are differences of opinion between jurists at each point of time. Society applies customary law, which is also respected by the people. When a judge is confronted with a lack in tradition or when something is ambiguous, he will apply the Islamic Shari'ah. However, as a sheikh explained, people with influence and power will use the law to their advantage.

Consistency between sources of law

From a legal perspective, a water conflict between two parties is a rather small problem, which could be solved by mediation without sophisticated legal systems or court cases. In reality, however, conflicts arise through differences in interpretation and use of applicable law driven through lack of knowledge and forum shopping, and driven by the need to find an authority, which is strong enough to enforce enduring decisions.

The legal system is pluriform and disjointed: contradictions exist between the various sources of law and legal references (formal law, traditional law, agricultural traditions), as well as within the formal body of law. There are contradictions between, on the one hand, the Civil Code and the traditional rights (which are broadly in line) and, on the other, the Constitution and the Water Law (which are in line).

The legal analysis showed that legal and institutional framework for the water sector in Yemen is susceptible to internal conflict; values and principles presented in the legal sources are divergent. With the adoption of the Water Law an attempt has been made towards conversion. Nevertheless, what can be assumed from reviewing the Water Law, Civil Code, Constitution and traditional customs and rules, is that conflicts will arise when the law is applied and when parties invoke these conflicting legal provisions.

A negative consequence of fragmentation is that this often leads to contradictions between approaches in the regulatory framework, which is likely to decrease the possibility to resolve conflicts in practice. A positive implication of the fragmentation is that the pluriformity of conflict settlement mechanisms allows stakeholders to jointly select legitimized mediators/arbitrators, which creates possibilities to settle conflicts without violence in a context where different stakeholders distrust many local and national authorities. Parties may look at for instance which institution is likely to provide them with the outcome they prefer and approach this institution. For example, the application of Water Law apparently differs per case, according to the need. This is caused, amongst others, by differing interests and a lack of knowledge on formal legislation in Water Law and Civil Code.

Clarity and practicality of provisions

The Water Law is ambiguous and full of loopholes. For example, the law indicates that water cannot be transferred outside a specific area unless for drinking use. The head of NWRA Ta'iz finds it difficult to assess and monitor such water transfers, and to determine for which purpose it is transpored, which is subject to manipulation. Secondly, a provision in the Water Law provides that anyone who carries out illegal drilling can be fined. However, punishments in the law are not strong enough to prevent people from committing violations according to participants of the stakeholder consultation workshop. The law indicates as punishment that a fine should be "no more than 200.000 rials" or a prison sentence that "does not exceed". The owners of the wells make a lot of money and they don't care about this little fine.

Authority to enforce decisions

The lack of enforcement of traditional and customary law, especially since the revolution in 2011, is an emerging problem as mentioned by most of the interviewees. A main observation is that there are several informal and formal conflict resolution mechanisms, yet all of them are too weak and they certainly don't complement each other. These conflict resolution mechanisms are weak for the following reasons: (1) Confidence in the fairness of courts and the traditional leadership has waned and has been compromised by the political developments over the last ten to twenty years, e.g. due to a complex nepotism and patronage system (see section 10.2.4); 2) The lack of enforcement of any type of law by official institutions such as the NWRA and courts. This is also mentioned by Van Veen is his report, as he states "in many places, state-based justice is simply either physically or functionally absent."

10.2.4 Political and institutional conditions

Rule of law: Saleh's patronage network

Over 33 years as President, Saleh strengthend his power by creating a complex nepotism and patronage system, in which checks and balances could not be properly enforced by democratic organisations (e.g. courts were structurally under-financed). These organisations were affected in one way or another by elites that

possessed power due to their proximity to the regime. Because of these problems, most of the described conflicts remain unresolved.

Saleh strategically used 'divide and rule tactics' to weaken any possible opposition: he rewarded parties for their loyance, and on the other hand by dividing tribes and stimulating tribal conflicts. Sheiks were deliberately co-opted by the government to secure tribal loyalty, which has increased the dependency of sheiks on the government and less on the tribes.[95] According to one interviewee, Saleh could reach this aim by giving money and other incentives such as power, jobs, land, project contracts as gifts to the people from conflicting tribes simultaneously. Also he used to supply fighting tribes with arms. "He would allocate bullets from the same warehouse to two tribes in conflict". The system and its related challenges have persisted through the current transitional period. Incentives were always given in return for blind loyalty to the General People's Congress (GPC) and Saleh. With money and power Saleh appointed local individuals as sheikhs, while these individuals had no status or experience in customary law or tribal traditions. They then managed to garner loyalty and some support through providing jobs and incentives to local people, mostly through corruption and patronage.

This undermined the authority of authentic sheikhs and created competition with original sheikhs and divisions along tribal lines. As a result, many sheikhs became more concerned with power and money and many turned their back to their communities. In some cases, sheikhs were even involved in corruption in local development projects and services. The authority of tribal sheikhs further declined through the 2011 revolution.

According to the participants of the stakeholder consultation workshop, the revolution was started without a clear vision, which has partly led to many religious, tribal, and military actors taking control over matters that are of great interest to themselves.

> "Authority cannot take a decision due to influential persons who are benefitting. We powerless are in constant struggle with authority. There is no funding for canal maintenance. Every year funding is promised, already for 18 years, but nothing happened."
>
> Participant consultation meeting, Amman, 2014

The revolution in 2011 that witnessed the exit of Saleh were not considered by the participants as one point in time, but as a period during which problems that have accumulated over time surfaced or became more prominent. The uncovering of these problems were viewed as positive by the participants, since it provides an opportunity to address and solve them. Nevertheless, the absence of the rule of law in both rural and urban areas presents obstacles to addressing and solving the problems.

The revolution contributed to the overall weaknesses of both state organizations and have divided and weakened the traditional mechanisms, by creating more diversity and more politicization of previously impartial parties. In general, there is a tremendous poor level of management with a clear disconnect between district level authorities, governorate level authorities and national level authorities. Water management in general has benefitted Yemeni elites to the detriment of society at large, while the lack of accountability has led to unsustainable exploitation of water.

[95] Erwin van Veen, *From the struggle for citizenship to the fragmentation of justice, Yemen from 1990 to 2013,* Netherlands Institute of International Relations Clingendael, 2014, p. 41-42

The National Dialogue Outcomes emphasize the development of a genuine civil state in Yemen – also as departure from the earlier system of political patronage where local leadership was co-opted into support for the central power and amply compensated by direct transfers of funds, assets and privileges.

> "Imagine a school of three classes with 42 million rials (144K euro) spent on maintenance from public funds."
>
> Participant consultation meeting, Amman, 2014

As extensively described by different other reports, corruption significantly hampers effective governance in many domains. Corruption negatively influences the perceived legitimacy of the judges, prosecutors and the police and the governmental system in general and, therefore, negatively influences compliance of the law. In addition, the burden of corruption is transferred in the end to the most vulnerable, which depend mostly on public services.

According to a participant to the stakeholder consultation meeting, after the revolution, the percentage of corruption has increased. There is no clear vision as to what should be done to address the corruption. The current system appearantly restricts the accountability of officials. Whereas prosecuting high officials is simply impossible because such a decision would require a large majority in the National parliament. The governing party in turn dominates the parliament, so the procedure cannot bring high-ranking officials to the court.

Lack of trust, information and knowledge

The lack of knowledge plays out in different dimensions:

- The lack of education and qualified staff in water management institutions and the water sector contributes to poorly functioning organisations.
- Lack of awareness at the community level, as well as the political leaders on water resource management and administrative leadership. Many people do not know that there is a Water Law and that this contains all these relevant agencies.
- There is little knowledge among ordinary people about the interactions of upstream and downstream water uses, groundwater flows, and interlinkages between spates and groundwater recharge.
- Throught the lack of trust, people are reluctant to share information (i.e., the cubic metres groundwater they pumped, the areas of land they possess, etc.) as they are afraid that this information will negatively affect their future course of action.
- There is a general lack of documentation of earlier (traditional) agreements. With some of the current local leaders (sheiks created by Saleh) being unaware of traditional or customary rule.
- Formal Water Law is too centralized and unknown: There is in general unawareness among legal personnel and the public at large as to the provisions of the Water Law of 2002 and the By-Law of 2011
- A further complication is that water related conflicts are not monitored in Yemen.

10.3 B: Conflict description and stakeholder analysis

The interview reports of the different case studies in Sana'a, Wadi Seham and Ta'izz provide a detailed view of how ordinary people deal with the water related conflicts in practice. The water conflicts are shortly described in the table below (Table 10.1). A more elaborated summary is included in Annex 8, which gives a brief overview of the conflicts in each case study, what the applicable traditional and customary rules are, whether formal law plays any role, the outcome of each case, and it also states the main problems as identified by the interviewees of each case study.

Table 10.1: Conflict descriptions of the individual case studies

Case 1	Sana'a: Shakik Dam
Parties	Shakik village *vs* Tan'im village
Conflict	The conflict concerns the user rights of the lake water, the amount and share of each village to the lake water, as the land was formerly common land. The people of Tan'im started using pumps to withdraw water from the lake, as they claimed that the dam prevents the flood and baseflow from reaching their area. The conflict began after warnings from the Shahik people were ignored.
Case 2	Sana'a: Arrowdah
Parties	A new land owner who established a grape farm *vs* older land owners in the town of Ber Julah/ Arrowdah
Conflict	The grape farmer diverted water from a flood to irrigate his land, thereby violating traditional arrangements regarding the use of the flood according to the Ber Julah landowners, as they were the older landowners.
Case 3	Sana'a: Bani Matar
Parties	Upper stream village of Galal *vs* lower stream villages (Al Kharabat, Mahiab, Bait Awad and Bait Habes)
Conflict	The Galal village dug wells for drinking water at the upper location of the Ghail Mahiab stream. The lower stream villages claim that the digging of these wells was the main reason that some of their wells stopped producing water, thus loosing their main water source for drinking and irrigation.
Case 4	Wadi Seham: Al Dabashia canal
Parties	Person 81 and others versus Tehama development Authority (TDA) and downstream farmers
Conflict	The TDA wanted to extend the Debashiya canal in order to reach the farms previously left out by the project. Person 81, whose land is already at the end of the canal, is against prolongation as he feared that the water in the canal will decrease. Therefore, he blocked the water flow to downstream users.
Case 5	Wadi Seham: Person 82 vs Person 83
Parties	Person 82 and his family versus Person 83 and others
Conflict	Person 82 and his family diverted the flow of the canal to its own land by using sand bags, in coordination with the TDA, as their land could not be sufficiently irrigated due to a new road that was built parallel to the main canal. Person 83, a farmer from the lower land, did not agree with this and continued to remove the bags, also using aggression at some point.
Case 6	Ta'izz: Shararah in Arrahedah, Demna District

Parties	Villagers of Shararah area with access to a well for drinking water versus Abduljabar's sons from a village up the stream
Conflict	Person 92 dug a well up the stream. The villagers were afraid that this would affect the supply of their own well. Therefore, they reported it to the local authorities and to the NWRA. Actions were taken, but Person 92 continued digging their well.
Case 7	Ta'izz: Bani Yousof Water conflict, Almawasit district
Parties	The people of the Qihaf village versus People of the Uqf village
Conflict	The people of the Qihaf village decided to pump water from down the wadi/well into their village. The people of the Uqf village living on the other side of the wadi started drilling wells close to the Qihaf well, in search of water. This happened too close to the Qihaf well, and the Qihaf villages took measures, including paying for security personnel and informing the prosecutor.
Case 8	Ta'izz: AlHoroor
Parties	Person 94 (local sheikh, also qat farmer) versus Qassem family (allround farmers)
Conflict	The main problem is random well-drilling in the area and decreasing water levels in existing wells. Qassem attempted to dig a well higher in the valley than the well of Person 94. Person 94 did not agree with this, and eventually took the case to court several times. Person 94 won each time. However, due to the contradictory statements of the NWRA in Ta'izz and Sana'a and the Qassems still pushing their objectives, the conflict is as yet unresolved.
Case 9	Ta'izz: Quaradha and Al Marzuaah village
Parties	Qurada village versus Marzooh village
Conflict	The conflict relates to the share of water produced by springs, with the two villages located on each side of the wadi. An assigned government committee ruled on the division of the water that was saved in special tanks, but Quradha village refused to acknowledge this ruling on several occasions. After 2011, the Quradha villagers decided to take control of the springs and divert the tankwater to their side, leaving the people of Marzooh village without tankwater.

Source: Authors

As a result from the divide and rule tactics of the Saleh regime, there is a general lack of trust of people, institutions, and information. With the 'collapse' of the Saleh regime political and power structures have changed in Yemen. However, the political economy has mostly remained in the hands of the same elite families. At the same time, there is an ongoing process of decentralizing national institutions. The capacity of the Government to implement water plans and policies is limited. The stakeholder analysis shows that there is a wide variety of public and private actors involved in water governance, management and operations and thus in water conflicts in Yemen. The actors are by far representative of a homogenous group, but instead comprise of a large variety within, illustrating the complexity of water governance in Yemen.

> "Water disputes are sensitive and they escalate too quickly. Disasters are coming our way if nothing is done about it soon"
>
> Participant consultation meeting, Amman, 2014

10.3.1 Agricultural water users

The main stakeholders in water conflicts are the rural and predominantly agricultural water users. As wealth is important in influencing the development of water resources, the poor (and women) are unequally affected by developments in the water resources

> "Women are water slaves. They fetch water all day"
>
> Interviewee in Ta'izz

system. In all the cases, women do not have any specific rights when it comes to water. On the contrary, women have more responsibilities. Women are responsible for securing water for home and drinking use. During droughts women need to travel long distances to fetch water, sometimes using donkeys and most of the time carrying water containers themselves. Women also help work and fertilize the land, remove grass, pick the crops, and clear the land.
Farmers have very little knowledge of the existence of official water authorities and the Water Law that govern the water use. Their concern is with the diesel fuel cost and its availability in the market. The price of oil will likely become more important for whoever receives the water.

10.3.2 New local powerholders

The relation between the private and the public spheres is very complex, as many private agents also hold public offices at the same time. This complexity is exacerbated by the pluriformity of regulatory and legal institutions (i.e., state, tribal, customary, and religious). All in all stakeholder constellations and their power relations in Yemen water conflicts are highly dynamic. True influence in developing the water systems is at the large private irrigation farmers, who control the lion's share of the available water resources.

> "In the past 15-20 years, tribal leaders bought farms in valleys. They didn't comply with the traditional rules. They only did it with power and weapons. Our problems are always with the leaders. Now we have new heads that have no relations with the tribes."
>
> Participant consultation meeting, Amman, 2014

The current situation creates opportunities for individual sheikhs and other powerful individuals to garner wealth through claiming new land and water resources without being confronted by local resistance. Newcomers are seen to enter the areas under study and start using, diverting, drilling water for multiple purposes, which in turn affects earlier local - downstream - communities. People feel they are increasingly oppressed by a system of sheer corruption in which local elites, external powerful actors, and governmental officers are the winners in the control over water while less powerful groups are left with no means to fight for their rights and solve water conflicts to their benefit.

10.3.3 Third party interventions

Generally, both the accusing and an accused party (or coalition) in the conflict have an interest in resolving the conflict, but both of them have different perceptions, goals, interests, resources and power to steer the outcome of the conflict process. This can result in a situation in which both parties are unable to settle the conflict. Subsquently, a third party can be invited to act in the settling of the conflict. Due to the pluriformity of the legal institutions, this third party intervention can be a state actor (courts, judges, etc.), tribal and customary institutions (sheikhs, eldermen, etc.), or a religious leader.

In most cases there is no clear leadership, also because leadership configurations are still in the process of resettling local power. Local leadership is based on individuals (often based on money and power), rather than organizational institutions (e.g., families, tribes). This can cause rapid shifts in authority and power constellations when, for example, old leaders pass away. In many areas there is no single leadership strong enough to take authoritative decisions. This not only has implications for the leadership within a tribe (with regard to water issues), but also in establishing a mutually trustworthy mediator or arbitrator in a context where there is little trust. An important condition for conflict resolution is that the authority of the third party

(and the institution it is representing) is perceived as legitimate by both parties in order to settle the conflict. A main challenge is, therefore, how to garner a critical mass of local stakeholders to support a decision of a third party mediating the conflict.

Conflicting parties first try to settle a conflict surrounding water resources through local conflict settlement arrangements (e.g., 6 old men, or neighboring tribal leaders). In this process perceptions of the conflicting parties on the legitimacy and authority of the third party are key for the acceptance of third party intervention.

Third party interventions: sheikhs and akhils

Generally it can be seen that the customary and traditional rules govern the judicial practices in these cases. Customary law is part of the collective identity of the tribes, and as there is basically no state-based judicial system, the people have little else to turn to.[96]

Tribal conflict resolution traditions include mediation and arbitration. The mediators' role is to stop violent clashes or potential ones. To prevent the dispute from escalating, they talk to conflict sides and convince them to resolve it either by means of direct negotiation or through arbitration. If the conflict becomes violent, mediators rush into the middle of the fighting zone carrying white flags. Warring tribes stop the clashes and talk to the mediators. Mediators then convince conflict parties to establish an immediate truce (usually 8 days) and choose an arbitrator or arbitrators.

Arbitration takes different steps and involves various stages; each has a certain protocol and a level of details and sophistication. Usually, conflicting parties agree on an arbitrator or arbitrators who then study the evidence, listen to the parties together and in separate caucuses, and then issue a verdict. There is a well-established appeals process if one of the sides is not happy with the verdict. Conflicting parties' preapproval of the arbitrator/s is a pre-requisite.

The culture of apology[97] is rooted in tribal customary law and conflict resolution traditions. There is a strong culture of apology and willingness to go as far as required to end the conflict and establish peace. It is due to these traditions that most conflicts in tribal areas in Yemen do not escalate into full-scale wars.

For the resolution of the conflicts, the parties mainly turn to mediation practices, in which they try to negotiate a solution for the conflict. Akils and sheikhs are the figures that should have the knowledge of the traditional rights and skills to lead such processes.[98] In practice they face constraints such as establishing trust with both parties, their knowledge about the geo-hydrological relationships, their knowledge of previous disputes, etc. The capability of the local traditional leaders (akils and sheikhs) to deal with the conflicts is deteriorating, either because they lack knowledge or because they are too involved in politics and not operating in the service of their community.

Third party interventions: The role of governmental organisations

Attempts to resolve the conflicts by the national governmental authorities are temporary, *ad hoc* and coercive in nature. This might be caused by the difference between rhetoric and actual policy implementation, despite

[96] Erwin van Veen, *From the struggle for citizenship to the fragmentation of justice, Yemen from 1990 to 2013,* Netherlands Institute of International Relations Clingendael, 2014

[97] See also: http://yementribalvoices.blogspot.nl/2014/04/font-face-font-family-courier-newfont.html

[98] As mentioned by Al-Zwaini, tribal leaders fill the vacuum in the areas where local state councils prove tob e ineffective. See Laila Al-Zwaini, *The Rule of Law in Yemen: Prospects and Challenges,* Hiil Rule of Law Quick Scan Series, 2012, p. 59

> "Too much centralization is what made things worse. Digging a surface well takes 5 days. By the time, the complaint is processed through government bureaucracy, if any, the wells are already dug and in use."
>
> Abdullah Assarari, Almaafer District Director

the Government's claim that it 'recognises the importance of water [as] only second to national security'. The root causes of the conflict often remain unaddressed.

In a few cases (the Wadi Seham cases and in the Bani Matar case in Sana'a) governmental institutions were asked to intervene. In these cases the institutions were already closely involved in the water management. In two of the cases in Ta'izz, parties attempted to solve the conflicts through official institutions such as courts. In all of these cases it is unknown if formal law played a role in the resolution of the conflict, even in the case that went to court (Person 94 *vs* Qassem). Nevertheless, in the cases of Ta'izz, neither party trusts the courts , due to corruption and/or political networks. As a result, the legitimacy and effectiveness of the legal system is questionable. Where Government organizations are called in to mediate in disputes, it concerns local Government or NWRA. The roles are, however, sometimes contradictory and never decisive.

Third party interventions: The role of NWRA

The NWRA has multiple options to intervene and steer the outcome of a water conflict between parties. NWRA has lawyers in their staff who follow up on specific cases in prosecution and courts. They can issue injunctions, broker between parties, send 'enforcement officers', study conflicts, and refer cases to court. The application of these instruments is, however, sometimes problematic.

One of the problems that was raised is that NWRA's immediate reaction is to issue injunctions, meaning orders to stop any water related activities that are being disputed. This most of the time happens without proper investigation and examination of the problem or the parties affected. In the case of Halhalah, for example, this pushed the Qassems to resort to NWRA Sana'a for help.

Another problem that has been identified is the coordination with other NWRA offices and authorities, which created conflicting reactions sometimes within the same governmental organization. For example, NWRA Ta'izz and NWRA Sana'a not only failed to communicate regarding the Halhalah conflict, but they took two different approaches. This caused a great deal of confusion and has the potential to harden both sides to the conflict and exacerbate the problem. Another example, NWRA issues permission to owners of drilling rigs (private individuals who run the drilling business) without prior consultation with district and local council authorities.

Next, powerplay seems to influence the ability to intervene. In case 8, the head of NWRA in Ta'izz, indicates that one of the stakeholders is a powerful man, well-connected and experienced in Shariah and the court system, which allowed him to direct the outcome in his favor. The issue affects their ability to enforce court sentences with regard to illegal drilling.

NWRA offices indicate that their lack of ability to address or at least lead an effort to address the root cases of conflicts concerning water is limited by a number of different reasons, namely small budget allocations, poor legislation, and a lack of cooperation from local and district authorities. According to the Alma'afer District Director, those affected by water conflict complain to the local council, but the local council has insufficient technical support from its Government.

The lack of capacity to provide information and to enforce water legislation contributes to its limited legitimacy and authority in conflict settlement.

10.3.4 Role of donors

The participants to the consultation meeting indicated that they are often unaware what strategies donors have with regard to their investments. They feel the need that donors should coordinate their efforts, in order to ensure that no duplication takes place. Many donors have stopped working in Yemen, primarily due to security reasons. The participants expressed the hope that international donors will return, and bypass the national government and deal with the local communities directly. Donors can add conditions to projects to activate the judicial and security authorities, even partially. Local authorities should be obliged to comply with Water Laws, principles of good governance and provide security arrangements.

10.4 C: Dispute regulation mechanisms

Water conflicts are addressed in a variety of mechanisms. In general, conflicting parties used to approach the local tribal leadership (sheikhs or akhils) for their dispute settlement, but nowadays other third parties are approached for conflict mediation (i.e., a new form of forum shopping), such as mutually trusted persons, NWRA engineers, or judges who act as advisors (source: stakeholder meeting). In the latter situation, a judge can provide advice when a case (such as deep well drilling) is new for the tribal system, but can also be solved by the judge with reference to Shari'ah.

From the start, it is important to make a distinction between conflicts that started over the access and use of water, and conflicts in which people were killed; 'water' conflicts are approached differently under traditional and formal law as conflicts over 'blood'. According to a participant of the consultation workshop, conflicts over water alone are not considered to be important enough to unite a tribe and organize a response against the perpetrator. Only if people are killed in the conflict, does it become an issue for the whole tribe.

There are customary rules that regulate cases involving mutual killing, although the application of customary rules is difficult. Revenge killing is the only single problem that is very difficult for Urf to resolve. There are no specific rules except blood money, which is, rejected most of the time because it is a big shame for a tribe to take blood money for their killed member from the perpetrator or his tribe. Revenge killing continues even if the original cause of the conflict, e.g., land, is resolved. There are only two rules through which revenge killing cases were resolved in the past: (1) the victims' family forgiving the perpetrators tribe; (2) when the number of people killed is equal, which according to the Urf should resolve the conflict. Many tribes take advantage of this rule, but of course it does not happen all the time.

Where governmental organizations are called in to mediate in disputes, it is oftentimes the municipal or district authorities or the NWRA. The roles are, however, sometimes contradictory and never decisive. The authorities for that matter are only indirect stakeholders. They play an advisory role in the water conflict, but have limited capacity (i.e., financially, in terms of staff, knowledge, policy instruments, authority and legitimacy) restricts their impact. As the Ta'izz case shows, the NWRA is not a uniform organization providing a coherent perspective on a case.

Water conflicts are seldom brought to civil court for a number of reasons. In almost all cases in this study, the conflict settlement mechanism in the first instance is not to seek formal legal institutions for settlement. There is in general limited faith in the fairness of the court, as demonstrated in the cases in Ta'izz where courts are neither trusted by the accusing party nor by the accused parties (due to corruption and/or political networks). Furthermore, although the traditional arbitration is already expensive to quarreling parties,[99] the costs of settling a conflict in legal courts is in many cases considered to be too expensive, which prevents people from seeking justice in the legal system. Consequently, most of the cases are solved within the local communities according to local traditions, as these are familiar to a large group of people.

Almost all of the water related civil court cases concern illegal drilling cases identified by the NWRA's branches field monitors during their daily monitoring program for illegal drilling elimination. In theory, if those field

[99] "The real war is the war of feasts- Alharb harb Almawa'ed" is a local saying indicating how costly it can get to host arbitrators.

monitors find any illegal drilling case they investigate, make a record and notify the local council and the district security forces, and request that the drilling be halted. Subsequently, the rig owner and the well owner are apprehended and delivered to the prosecution service. Meanwhile, the branches send the record to the district prosecution in order to proceed with the case and those arrested proceed to the court. After that, the branch lawyers can follow it up in the court.

In reality, due to many causes, only very very few cases could enter to the court. One of the main reasons is the high reluctance by the district security forces and prosecution to enforce the Water Law. For example, approximately 29 illegal drilling cases were recorded in the first three months of 2013 in the Sana'a basin. However, only one or two finally entered the court system. The efficiency of the respective NWRA Branches plays a vital role in these figures. For instance, the number of illegal drilling cases recorded by the NWRA Sana'a Branch shows a drop between 2010 and 2012. This does not mean that the illegal drilling have declined, but rather that the monitoring activities were very limited during that period due to the financial limitation and instability at that time.

Water conflicts are different from the above-mentioned illegal drilling cases. These conflicts between water users are rarely brought to the NWRA or any other agency. Even when reported by one of the parties to the district security services, they are recorded as civil conflicts rather than water conflicts. The cases that eventually do go to court are those that local communities are unable to solve. Many of the court decisions issued, do not rely on the Water Law, but on the property of land.

Water-related conflicts, which involve killing and are brought before the criminal court, provide a limited insight into the occurrence of water conflicts in Yemen. According to an estimate based on the criminal court cases,[100] each year 2,500 people die as a result of a water related conflict. It is, however, unclear how many cases are ultimately decided by the courts. Approximately one-third of the cases brought before the Criminal Court (and thus involve killing) are water related cases.

Sustainability of dispute resolutions

Although some conflict cases were characterized by violence, the majority of the stakeholders do not have an interest in resorting to violence as a means to forcefully settle a conflict. It is likely that the outcome of such an activity brings too much uncertainty and comes with too many costs to be a means for settling a conflict over water. Most stakeholders have an interest in a harmonious settlement of the conflict; however, this does not always result in sustainable water use systems, thus not leading to a resolution of water scarcity issues. Peaceful settlements are not always perfect as they do not always address the root causes of a conflict, but rather prevent the conflict from escalating. Therefore, the conflicts described in this report might still be smoldering underneath the surface, waiting to be lit once again in the future. The agreements can be considered as fair within the current situation, but when a situation changes (water in Shahik dam, or further decline of groundwater levels in various cases) existing arrangements might proof fragile. A complication is that water related conflicts are not monitored in Yemen. In practice, issues are mixed and too complicated to be solved by sheikhs or the legal system alone; in the majority of cases no single authority is able to resolve the issues at hand. As information on and knowledge about water resources and flows is in most cases limited, the parties are hampered in their

> "Twisted peaceful settlement is better than functioning Shariah"
>
> A local saying indicating how little trust people have in government and the official rule of law.

[100] Personal communication with the vice-president of the Supreme Court in Yemen

ability to make sound agreements on more sustainable water resource use. Accordingly, the stakeholders and third parties prioritize satisfying quarrelling parties, rather than the sustainable management of the resource. However, in various cases in this research and other sources, groundwater and surface water users in the agricultural domain were able to establish news rules to adjust to different requirements of the situation. The table below summarizes earlier research on this adaptive capacity.

Table 10.2: Newly established rules in response to changing physical and socio-economical conditions

	Place	Type of local rule
1	Hejraht al-Asham, Jabal al-Sharq- Dhamar	Restrict well drilling
2	Wadi Khalaka, Sana'a	Restrict well drilling, ban on tankers, well depth
3	Khrabat Muhyab, Bani Matar, Sana'a	Restrict well drilling, well spacing
4	Qarwa Beshar, Jahanah, Khawlan, Sana'a	Restrict well drilling
5	Hijrat al-Muntasir, Amran	Ban on new drilling
6	Wadi al Qarada, Bani Hushaish, Sana'a	Restrict well drilling, recharge weirs in wadi bed, well sharing
7	Wadi Akarem, Dhamar	Restrict deep drilling in the main wadi
8	Bani Garban, al-Kafr District, Ibb	Protection zone
9	Al-Gawaref, Ibb	Ban on qat irrigation
10	Wa'alah, Amran	Ban on water transport by tankers
11	Bait Sarhan and Alhamrmaly, Amran	Ban on water transport by tankers
12	Al Ma'akhad, Amran	Ban on water transport by tankers
13	Qa'a Al-Shams, Amran	Ban on water transport by tankers
14	Bani Maymoun, Amran	Tankers only within village
15	Wadi Dhelaa, Hamdan, Sana'a	Well spacing, well sharing, dam development
16	Wadi Al Zabaira in Qadas, Al Mawasit District, Taiz	Restrict/ban well drilling, closing disputed wells
17	Al Aroosi, Mehan, Sana'a	Closure disputed wells, agreement on reservoir operation
18	Al Mashra, Damar	Ban on drilling
19	Wadi Al-Har, Anss, Dhamar	New agricultural wells only if they serve drinking water too
20	Mawia, Taiz	Joint WUA to regulate new well development, replacement of qat in some area
21	Al-sinah, Almaafer, Ta'izz	Well distance, blocking out well development in sensitive areas, permission by NWRA only with consent of the cooperative
22	Wadi Sana'ah, Dhamar	Spring protection – zoning; distance rule
23	Hejrat al-a'asham, Jabal Al-sharq, Dhamar	Protection zone
24	Al-Wahda, Al-Maafir, Ta'izz	Ban on new wells, non-well owners to share in existing wells
25	Zubera, Wadi Siham, Hodeidah	Preventing new shallow development by referring cases to Local Council and NWRA

Sources: The compilation is drafted by Van Steenbergen, 2011 and is based on field documentation, van Steenbergen (2006), Ward and Al-Alauqi (2008), Bruns and Taha (2009), Bonzanigo and Borgia (2009) and Lichtenthaeller (2010)

Chapter 11. Recommendations

Key message:

The limited outreach of the government regulatory mechanisms, the distrust and avoidance of the judicial system and the history of strong local management in Yemen strongly suggest that the improvement lies in strengthening and connecting formal and informal dispute resolution mechanisms in order to reduce the legal pluralism. Improved water conflict prevention and water-related dispute resolution mechanisms require significant investments in the overall institutional capacity, thereby safeguarding the needs for awareness raising, training, transparency, accountability and participation.

11.1 Introduction

The new regime in place in Yemen is heading to a new system of government, likely a federal state system. Through the National Dialogue, Yemen has started the process of formulating a new constitution based on six regional states. This will change the relation within the river basins, as they cross regional state boundaries and should be a reason to start formulating or updating water rights and allocation rules. However, at the same time there is a risk of confusion and extended weakness of governmental organizations, resulting in further fragmentation and parallelism. The previous decades saw no structured interaction between public sector and water users. Formal governmental organizations are ineffective and implementation of projects is characterised by large budgets, e.g., for subsidized pumping, but with only very meagre support for better water resource management, watershed protection, recharge, or efficient water services. The new political landscape may offer an opportunity to strengthen local management and power constellations.

> "Water risk will oblige us to displace. Unless we have long-term strategy"
>
> Participant consultation meeting, Amman, 2014

In the table below (Table 11.1) provides summary of recommendations in priority order.

Table 11.1: Summary of recommendations and implementation phase

	Recommendations	Short term	Mid-term	Long term
1	Knowledge exchange on water system	X	X	X
2	Publicly available agro-climatic and market data		X	X
3	Alternative cash crops to replace qat			X
4	Documentation of traditional water access and distribution rules	X	X	X
5	Awareness raising on legal issues and responsible authorities	X	X	X
6	Awareness raising on relation water usage and conflict	X	X	X
7	Improve connection between local and national authorities			X
8	Document local agreements on conflict resolution	X	X	X
9	Train government staff in legal issues	X	X	X
10	Monitor and evaluate conflict resolution practices	X	X	X
11	Implement 10 institutional design principles			X

12	Baseline assessment on current capacity development problems	X		
13	Develop management tools and instruments for WUAs		X	X
14	Identify the context specific arrangements		X	
15	Actively facilitate multi-level governance		X	X
16	Strengthen data collection on the basis of watersheds		X	X
17	Develop fund to support court access for the vulnerable			X
18	Mobile water courts		X	X
19	Study on the role of donors in water management		X	
20	Strategy for first responses to water conflicts	X	X	
21	Operationalize existing water related laws			X
22	Support capacity of third parties intervening in water conflicts	X	X	X
23	Support embedding of mediation in current legal framework			X
24	Improve codification of water rights and rules			X

11.2 Raising awareness, building capacity and exchanging information

People do not always adhere to the law, rules and regulations, especially those being introduced from outside their community. Rules require enforcement and legitimacy. Legitimacy depends on trust and trust is built by accountability, transparency and fairness of rules and procedures (i.e., predictability). As traditional rules continue to play an important role, it is recommended to support the debate about how to accommodate the traditional values in the challenging requirements of the near future. This includes a better understanding of the state of affairs with regard to the current water needs and future requirements.

On the water system:

1. Support local **knowledge exchange** within the water system (basin). For example, support the farmer-to-farmer exchange of good practices over the regulation of groundwater.

2. Strengthen initiatives that make **data** (on for example agro-climate data and retail prices of agricultural produce) **publicly available** (through for example mobile phones).

> "We cannot expect the government or military to solve our problems but we need to take the problem-solving into our own hands. Conflict resolution needs to be organized so that tribal leaders who are known for their integrity are involved. International donors can supervise the resolution process, e.g., Dutch embassy."
>
> Participant consultation meeting, Amman, 2014

3. Qat production is a very important source of income. A strategy aiming to diminish the amount of qat should focus on the demand and production sides. Raising awareness on the health and environmental impacts can help reduce the demand. Whereas on the production side, farmers should be assisted with growing **alternative sustainable cash crops**, such as almond trees. This requires market chain development and commitment from donor countries, e.g., to address escalating tariffs and other restricting rules.

On the current water rules and responsible authorities:

4. Support the **documentation** of traditional water use and access rules (of surface, subsurface flow and groundwater). By further detailing the link between the rules and the use of water, traditional knowledge can be better integrated into the facilitation of court decisions, thereby increasing local acceptance.

5. Ordinary agricultural users do not seem to have an understanding of formal water use regulations. The applicable rules and their rationale should be explained to the agricultural users in a way that complies with traditional approaches and values (see previous point). **Awareness raising campaigns** can help to improve their understandings of the law, and of possible impacts from existing water consumption practices (such as the impact of barriers in ephemeral water distribution systems).

On conflict prevention and resolution:

6. Awareness on the impact of water use on water shortages (and conflict) is often lacking. Stakeholders need to be better informed about processes and trends regarding the water systems, and how these may lead to problems and conflicts. Increased awareness might reduce the conflict potential. Therefore it is suggested to develop and support regional and subnational **workshops** on this topic. In addition, use **social media** (radio, Facebook, etc.) to spread outcomes of such debates and research findings to a larger audience. Ask **influential people** (such as the mosque sheikh, village leaders) to address their communities on these topics.
7. To improve the connection between local and national authorities, the NWRA should open **local offices** at the district level to work with local authorities on conflict prevention. These local NWRA offices should be provided with enough capacity to respond to problems and work with district authorities and security forces to intervene.
8. By **documenting the local agreements on how conflicts are and should be resolved**, the local institutional memory can be strengthened. Such a documentation system is, however, likely to be influenced by the most powerful, and should, therefore, be subject to a regular open review process.
9. **Train** governmental staff, including judges and public prosecutors, in the use and enforcement of existing legal instruments. Instruct them on the norms and traditions of agricultural conditions prevailing in each area to ensure that they can harmonize the legal codes with the customs as to increase the acceptance and enforcement of the rule of law.
10. **Monitor and evaluate** the practice of local water-related conflict resolution and the developments in local laws and regulations. Next, identify options to improve conflict resolution mechanisms.

11.3 Strengthening collective choice arrangements

Water conflicts in Yemen are often too complicated to be solved by sheikhs or the legal system alone; in most cases there is no single authority that can resolve the issues. As information on and knowledge about the water resources and flows in most cases is limited, the parties are hampered in their ability to make sound agreements on more sustainable water resource use. Accordingly, the stakeholders and third parties prioritize satisfying quarrelling parties, rather than the sustainable management of the resource.

11. In the short, medium and long term, one of the key priorities and challenges for water management in Yemen is the strengthening of collective choice arrangements, as a proven institutional design principle for conflict prevention, resolution and sustainable management of water resources. Building upon on earlier empirical work in Yemen and other parts of the world, as well as theoretical notions from relevant literature, we suggest a set of **ten institutional design propositions for conflict prevention, resolution and sustainable management of water resources** in Yemen (see Table 11.2). These institutional design propositions support a ‘‘management as learning’’ approach to dealing with

complexity and uncertainty. They do not specify blueprints, but encourage sustainable water management tuned to the specific features of local geography, ecology, economies, political situations and cultures.

12. Before steps can be taken to reinforce local capacity, a **baseline assessment of the current problems and limitations** is essential. Issues that should be identified include the clarity and strength of mandates, institutional boundaries, capacities, tasks, roles, responsibilities, interests and involvement of all relevant stakeholders. The possibility of elite capture, as observed within current Water User Associations or Basin Committees, should explicitly be avoided. Proven methods exist to avoid elite capture during collective choice sessions and independent operation of the committee (ranging from protocols for decision-making to making unwanted behavior publicly known), but all possible solutions should be made to measure.
13. For the institutional design it is recommended to identify and (further) **develop appropriate tools and instruments** for:
    a. monitoring and evaluation,
    b. graduated sanctions,
    c. collective choice arrangements with broad and horizontal stakeholder participation (e.g., involving respected elderly people who know about traditions),
    d. equal and fair (re) distribution of costs,
    e. benefits and risks and
    f. conflict prevention and resolution mechanisms
14. For all these institutional elements, all parties (donor community, Yemeni Government, civil society, etc.) have to be aware that it is crucial to develop **context-specific arrangements**. These arrangements should take the environment in which local authorities and WUAs have to operate into account, focusing on effective cooperation between them, the required capacity building and training of staff, joint information production and exchange, how to deal with corruption, and how to provide a positive incentive structure, which stimulates accountability and responsiveness.
15. When common-pool resources involve the interests of multiple stakeholders, as in the case of larger (transboundary) river basins or groundwater systems, an additional design principle needs to be added in order to ensure the foundation for a more robust governance system: Local parties tend to only address the local issues, whereas national parties tend to only address the national priorities. In the case of boundary-crossing common-pool resources, both the local and national voices need to be included in decision-making process. Therefore, **multi-level collective governance** is needed. As collective governance does not emerge spontaneously, it should be built upon traditional governance structures, rather than (new external) state structures, with active facilitation and promotion.
16. Furthermore, a river basin approach can be developed and implemented step-by-step. In the first step, a river basin approach can be used to **gather data on water rights, current usage and interventions** that might have an impact on the availability and distribution of water (e.g. check-dams, deep wells). Projecting these figures onto the physical and socio-economic changes helps to identify sources of conflict, as well as to find solutions to the conflict.

Table 11.2: Ten institutional design propositions for complex water governance systems (Huntjens, 2012)[101]

Institutional Design Proposition	Explanation
1) Clear knowledge on the resource system and responsibilities	Clear knowledge on the resource system and responsibilities can be thought of as a first step in organizing for collective action (Ostrom, 1993). When confronted with social and physical challenges, e.g. the impacts of climate change on groundwater, it is important to clarify who is affected by this problem and who has the responsibility, capacities, access to resources and information to deal with this problem (Huntjens et al., 2012).
2) Equal and fair (re-) distribution of risks, benefits and costs	In principle, those who receive the highest proportion of the water should also pay a corresponding share of the fees (Ostrom, 1993). Within the context of climate change, or other external disturbances, it is important that stakeholders at risk are given opportunities to participate in reshaping and reducing the risks to which they will be exposed. This requires engagement with, and strong representation of, groups likely to be highly affected or especially vulnerable (Huntjens et al., 2012). In the context of Yemen, the first step towards redistribution should focus on increasing the awareness on the current distribution of risks, benefits and costs.
3) Collective choice arrangements	Actors who are affected by the operation of the system should be able to participate in the decision-making on the system (Huntjens et al., 2012). Furthermore, a range of options (e.g., financial, taxation, administrative, legal powers) is available to participate depending on the requirements of the local context.
4) Monitoring and evaluation	It is important to monitor and evaluate decision-making, as well as the development and implementation of policies with regard to the use of common pool resources (Huntjens, et al., 2012). The process of monitoring and evaluation serves to adjust the course of action and motivate those driving the processes. Actions and objectives can then be adjusted based on reliable feedback from the monitoring programmes and improved understanding (Nyberg, 1999). Monitoring and evaluation is often not implemented due to lack of available resources. In that case an important measure is to have agencies at least review impacts of their policies and other interventions (Huntjens, et al., 2012).
5) Graduated sanctions	Appropriators who violate rules are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other appropriators, from officials accountable to these appropriators, or from both (Ostrom, 1993). As a first step in Yemen, the government with support from donors should focus on creating reasonable sanctions and strengthenen the enforcement capacity.

[101] Huntjens, P. (2012) in: Wijnen, M., Augeard, B., Hiller, B., Ward, C. and P. Huntjens (2012) MANAGING THE INVISIBLE - Understanding and Improving Groundwater Governance. Water Paper, June 2012, published by the Water Unit, Transport, Water and ICT Department, Sustainable Development Vice Presidency. World Bank, Water Partnership Program, 2012

6) Conflict prevention & resolution mechanisms	The Yemen Government should strengthen the congruence between the different sources of law with regard to conflict prevention and resolution mechanisms. Rapid access to traditional conflict resolution is currently available, but often suffers from a lack of legitimacy. As a result, people are likely to shop for a forum powerful enough to address their grievances.
7) Minimal recognition of rights to organize	The rights of appropriators to devise their own institutions are not challenged by external governmental authorities (Ostrom, 1993).
8) Nested enterprises / polycentric governance	When common-pool resources involve the interests of multiple stakeholders, as in the case of larger (transboundary) river basins or groundwater systems, an additional design principle needs to be added in order to lay the foundation for a more robust governance system. Local parties tend only to address the local issues, whereas national parties only tend to address the national priorities. In the case of boundary crossing common pool resources, both the local and national voices need to be included in decision-making. Therefore, multi-level collective governance is needed. As collective governance does not emerge spontaneaously, it should be built upon traditional governance structures, rather than (new external) state structures, with active facilitation and promotion.
9) Robust and flexible processes	Robust decision-making institutions (including relevant norms and practices) and policy processes continue to work satisfactorily when confronted with social and physical challenges but are at the same time capable of changing (Huntjens, et al., 2012). Trust and reciprocity are important elements of a robust and flexible process (Huntjens et al., 2012). If the government integrates water governance as a cross-sectoral issue in their existing policies, it will reduce the incidence of large adverse side-effects and feedbacks or 'maladaptation' (Dovers & Hezri, 2010).
10) Policy learning	Policy and institutional adjustments based on commitment to dealing with uncertainties, deliberating alternatives and reframing problems and solutions (Huntjens, 2011; Huntjens, et al., 2011, 2012).

Box 11.1: The Ta'izz Water Supply and Sanitation Project

In 1997 the World Bank established the TWSSP to help facilitate relief of the failing city's water supply. It considered the co-operatives or such similar non-traditional institution as potentially capable of negotiating rural-urban water transfers and distributing compensation equitably (World Bank, 1998). Apart from supply side aspects and incorporation of public utility reforms, the project promoted stakeholder participation in rural-urban water transfers through the establishment of committees and water user associations (Handley, 2001). The government approved this reform agenda as a Council of Ministers Decree in 1997. Awareness campaigns and consensus-building among stakeholders and political leaders and local demand supported the reform process. Currently, 95% of the total urban population related to utility towns is attended by independent utilities (Gerhager & Sahooly, 2009)

Box 11.2: The case of Al-Sinah, Almaafer, Ta'izz

Al-sinah area is located in Wadi Al-asloom, Almaafer District, Ta'izz Governorate. This is 30km west of Ta'izz. The area consists of 12 groups of villages with a total population of approximately 18,000. It is well-known for its cooperative society. Al-sinah and its cooperative society stand out as a single example of long-term institutionalised local development and resource management. Al-sinah cooperative society has few remarkable features that earmark it as a special case:

- Democratic structure: The management is elected every three years with an elaborate structure of twelve election assemblies. There is no traditional local leader. The preference is for people of high integrity. There are no big social and income differences in the community and education is widespread even among women.
- Conditional partnership with public agencies: The Al-sinah cooperative society systematically liaises with public agencies and has sought specific support for parts of its investment program from different development programs. However, the association has refrained from automatic involvement in projects.
- The association plays a role in local groundwater management. Within the area a distance between wells in the range of 500 meter is observed.

The Al-sinah association also works together with the Ta'izz branch of the NWRA. NWRA does not issue any well-drilling permits without consulting with the association and obtaining a written consent from the association. (Van Steenbergen et al. 2011)

11.4 Support for the Rule of Law

If traditional approaches succeed in maintaining and regaining their legitimacy, they provide an entry point for strengthening the rule of law in the longer term. Already, in some areas the traditional system partially filled the institutional vacuum created since 2011 and provided adequate solutions. The traditional rule system is a flexible system and may adapt, as circumstances require: in response to the requirements of the situation, new rules and practices have been created. Within this research on some occasions, the outcome of a conflict seems to result in the establishment of new rules to govern the practices (well spacing, common ground, common water resources, etc.). This has been confirmed in our findings, as well as in the findings of Van Steenbergen,[102] who showed the capacity of local individuals to draft local rules to fit new circumstances (see Table 10.1 in Chapter 10). It is, therefore, recommended to support the traditional and formal rule, by combining their strengths.

17. Assist the development of a **fund** to support access to courts for the poorer populations of Yemeni society. Needless to say, the necessary safeguards should be put in place to prevent capture.
18. Develop **mobile water courts** for water related conflicts. Mobile courts have been recommended before and attention should specifically be given to their susceptibility of corruption. Alongside the court rulings, these mobile courts should provide education on the applicable laws and provide technical advice in relation to water issues (thereby facilitating conflict resolution outside the courts). In this manner, the gap between formal law and traditional law can be bridged (and the legitimacy of the court rules can be improved) and justice is made accessible, even for the most disadvantaged groups. Mobility has also the advantage that political-economic connections of a 'crony capitalist nature' (that provide opportunities for rule, self-enrichment and prestige) have less impact on the objectivity and legitimacy on court rulings.
19. Support an independent evaluation on the **role of donors** on water management and the potential for conflict.

[102] Frank van Steenbergen, Omar Bamaga and Adel Al-Weshali, 'Groundwater Security in Yemen: Who is Accountable to Whom?', 7/2 Law, Environment and Development Journal (2011)

20. A strategy needs to be developed that outlines practical **first responses to disputes over water**. The strategy should be drafted with participation from sheikhs, NWRA offices, the Governors' Office, district directors, prosecution officers, and local judges and user groups. As part of the strategy, a clear communication system needs to be drawn among the different government entities involved.
21. The existing laws need to be **operationalised** over a longer period of time, especially the Water Law of 2002 and the By-Law of 2011 that contain strong provisions to regulate all matters relating to water use, distribution, and the prioritisation in the access to it. Operationalization requires learning lessons from their current lack of impact.
22. There is a need to **strengthen the capacity of third parties actors in resolving conflicts**. For example, through providing training in traditional and formal legal principles of water distribution and conflict resolution. Possible actors are NWRA, WUAs, and local government actors. Currently, individuals within these organisations often act on a personal account.
23. Stimulate the **embedding of mediation approaches** in the current legal system as a recognised approach.
24. There is also a need to **better codify the water rights and rules**, which supports the differentiation between surface water, subsurface flows, and groundwater (without loosing the necessary interlinkages):
    a. For example, there needs to be clear regulation for the distance by which water can be transferred outside its source, and the quantities of water allowed to be pumped for irrigation purposes.
    b. Another example is that surface (spate) water allocation rules have been formulated for several ephemeral rivers, yet they are in many cases out-dated as they did not accommodate for the presence of permanent structures or the effect on recharge and hence the availability of drinking water

> "We cannot tailor the law to each district in accordance with everybody's needs. The law is a public one and should be applied to everyone. There are good methods for mediation and tribal arbitration already in place. 70-75% of the conflict cases are solved by tribal arbitration. Why can't we legalize these alternative rules to make them accepted? The responsible parties should have the opportunity to implement these alternative solutions within a given period of time and if they fail, then we can go to court."
>
> Participant consultation meeting, Amman, 2014

Annexes

Annex 1: The Civil Code no.14 of 2002

Based on the Shari'ah, Article 1359 of the Civil Code provides that water is originally nobody's property (mubah) allowable to all. As such, it is the entitlement of the whole community and may not be privately owned, unless contained in a receptacle i.e. reservoir canal) that separates it from the source. The Civil Code contains a number of provisions regarding water irrigation and use rights, such as:-

Article 1360:- Stipulates that *res nullius* water is the entitlement of whoever reaches it first, even if the water is located in someone else's property, but the water taken may not exceed the appropriator's needs;

Article 1361:- Specifies that "a partner in a common canal has no right to connect another channel to it unless he obtains the other partners' permission";

Article 1363:- Specifies that the right to use water for irrigation is an appurtenance to the lands, so that it is inheritable but it cannot be sold separately from the land, neither may it be rented or donated, except in accordance with a recognized custom.

Article 1364:- States that sufficiency is to be determined on the basis of water use when the land was first reclaimed or, if this use rate in unknown, on the basis of use when the land began to be irrigated.
In spate irrigation, the quantitative measure of the right of the upstream user is customarily established at the height of man's ankle; and
Reflecting the Shari'ah and custom regarding equitable allocation of water the Civil Code has the following provisions:-

Article 1365:- States that "a person is not allowed to draw water to irrigate land that has no water right if such appropriation harms those who have a water right";

Article (1366):- The right of water-way is the right of a land owner to have the irrigation water flow in other people's land in order to reach his land. If this right is proven for somebody then the owners of the other lands on which the water flows have no right to prevent him.
It also set the obligations of each party with respect to maintaining and rehabilitating the water-way so as to prevent damage to the intermediate land (article 1367).

Article (1367):- A water channel owner must operate and repair it so as to remove the harm which may occur to the land in which it passes through. If the channel owner refuses, then the land owner may undertake and pay for the repairs then claim the expenses.
The law also regulated issues of compensation to Intermediate Land, the right of the intermediate land to benefit from the passing structures (canals or pipes) provided a share of the cost is paid.

Article (1368):- A landlord who irrigates his land using extracted natural water and other waters has the right to obtain (for his irrigated land) a channel-way in the intermediate land between it (the water) and his land… for a fair compensation to be paid without delay, unless it is customary not to compensate, and provided that the benefits that accrue to the owner of the intermediate land are not clearly damaged, and if a damage actually occurs then the landlord (of the intermediate land) can demand compensation for the incurred damage.

Article (1369):- The owner of a land which is located in-between the water source and the land to be irrigated should permit passage of the necessary pipes to transport the water in exchange for a fair compensation to be paid in advance. He may utilize these structures provided that he contributes to the costs of construction and that he pays for utilization in proportion to the benefits he receives.

Article (1370):- If a property is damaged due to water-transport pipes, then property owner may claim compensation from the benefactor.

Annex 2: The Water Law no (33) of 2002

The Water Law No. (33) of 2002 which was issued in August 2002 was amended in 2006, stipulates in article (4) that water is a right which is accessible to all and does not become privately owned except by means of transport, acquisition or any related methods.
The following articles in the Water Law are related to irrigation distribution and water rights as follows:

Article 6:- States that all beneficiaries of any of the water resources shall enjoy the right to benefit from this resource in such a way as not to harm the resource or the interest of other beneficiaries and shall carry out all the duties required to him with respect to the conservation of these resources and safeguard them from depletion and pollution.

Article 12:- Provides that NWRA shall take the sufficient measures and procedures to ensure fairness and equity of distribution of available water and to protect such water from overexploitation and pollution.

Article (17):- Provides that NWRA shall undertake in coordination with MAI plans for protection from floods and measures which relate to improvement and development of methods to utilize rain, spate and base water and to recharge groundwater.

Article (25):- Which provides for the functions and responsibilities of MAI especially in relation to spate irrigation and constructing water structures and their operation and maintenance. Also, to make plan for protection from floods and making monitoring systems. MAI has the right to take appropriate and urgent measures as it deems fit in case of floods to destroy any structure or canal or to make any structure to avoid dangers of floods provided that fair compensation is paid to those affected by such measures taken. MAI, shall set and implement plans and programs that relate to cleaning Wadis and Public Canals and to monitor flowage of spate water and floods and to supervise use of water irrigation and its structures so that to ensure the safety of such structure and to conserve water from waste and pollution.

Article (27):- Stipulates the following "the right of water use authorizes the holder thereof to dispense the water, in such a way as not to conflict with public interest and the prevailing customs and traditions in each water zone or water basin, and in all cases, the existing and acquired water rights, whether prior to the issuance of the law or thereafter, shall be maintained and shall not be touched upon, except for the utmost necessity thereof and with fair compensation provided therefore."

Article (28):- "Due consideration is to be given to benefiting from the traditional water rights of rainwater harvesting and natural runoff flow, with respect to their use in irrigation and their link with agricultural land that benefits from such water resources. This should also take into consideration the properties and characteristics of each region with respect to the customs, traditions and irrigation systems in effect in each region of the Republic.**"**

Article (29):- "The traditional rights to benefit from natural springs, streams brooks, creeks and maintained surface wells, the depth of which does not exceed sixty meters, and the common rights associated with them, prior to the issuance of this law, on which the holders thereof maintain their currently hold as existing rights. This is without prejudice to the rules for registration and these rights remaining allocated for the purposes. For which they were originally granted. In the event that such rights are transferred to other parties, then such

rights shall be compulsorily transferred to the new owners, and in the event that the land benefiting from the water are partitioned, the water shall be apportioned according to the land areas resulting from the partitioning of such land."

Article (30):- "Without prejudice to the sanctified and water quarantine areas, quantities of water may be acquired in cisterns, pools or streams, by means of directly harvesting the water from rainfall that falls on the surrounding land thereof, which is owned by the beneficiary thereto, or in the adjacent areas, where the beneficiary has been authorized to benefit from harvesting the rain there from. Such acquisition is considered as an acquired benefit, if it does not harm the benefits previously acquired thereto and does not conflict with acquired water rights, in accordance with the recognized traditional rights and customs related to the right of benefit from rainfall water. The beneficiary may also, according to this article, set up the required water installations, which take advantage of the water quantities gained, as well as the construction of small irrigation structures and to excavate for subsidiary canals, in accordance with the procedures and controls that are set forth in the Executive by-Law."

Article (31):- "The Executive by-Law shall spell out the cases when the Government may withhold the acquired rights of benefiting from water, if public interest so dictates or if the rationing of water use is required, with fair compensation to be provided in accordance with the existing laws."

Article (32):- "All holders of rights of utilization in accordance with articles (28-29) of this law are required to come to NWRA to register their rights accordingly within a period of three years maximum from the date of announcement accordingly issued by NWRA after the issuance of this law."

Article (33):- "All holders of rights of utilization benefit from groundwater wells dug prior to the issuance of this law and the holders of common rights thereto, whether such rights are utilized or not, are required to come to NWRA or any of its branches in the governorate offices or district centres to register their rights accordingly and to continue benefiting from such rights of benefits and the common rights therewith associated, within a period of three years maximum from the date of announcement accordingly issued by NWRA after the issuance of this law."

Article (34): "NWRA and all of its branches shall maintain a register of acquired rights of benefit from water. The Executive Procedures shall spell out the system and rules for maintaining such a register and the procedures for registering and amending such registration accordingly."

Article (37):- Specifies that no beneficiary may exceed the amounts or purposes spelled out by General Authority for Water Resources (NWRA) in the permit and must comply with all the terms spelled out in the license.

Article (45):- Para 2, stipulates that URF (traditions) and customs as recognized and accepted shall be adhered to in relation to water rights of beneficiaries and its servitude rights as well as its structures.

Article (61):- Provides for protection from spate water. MAI is responsible to set measures to regulate the catchment areas and control flood and its flowage and distribution. This responsibility shall be carried out through the cooperation of the local authority and all water users.

Article (62):- Stipulates that all users and beneficiaries of spate water and those having agricultural lands or structures adjacent to its flow path must participate and contribute to the protection of their properties and in

regulating water flowage from which they benefit. Those beneficiaries who are adjacent to spate water flowage are entitled to construct fences to protect their properties to safeguard it from dangers of floods provided that such shall not affect the public interest.

Article (69):- Concerning penalty for a period not exceeding two years to any person who drills a well or construct any water structure to capture spate water or to divert it from its natural course whether for himself or for others with or without charge having no license to do so from NWRA.

Article (70):- Provides for imprisonment of a period not more than six months or fine not more than YR 200,000 along with suspension of any work in relation to such violation and obligation to repair the damage in case of any expansion or extension or reclamation of agricultural land or civil or industrial establishments or others occurring in Wadi flowage of spate or in public canals which results in obstructions of spate flowage in such Wadis in their specified flowage courses.

Article (71):- Provides for imprisonment no more than a month or fine not more than YR 30,000 to any person who did not register his beneficiary rights with NWRA in time. Also, any person who assigns to other person his drilling license or his beneficiary right without NWRA approval.

Article (74):- Stipulates that NWRA shall consult and coordinate with MAI concerning the functions and responsibilities of MAI as provided for in this law.

Article (75):- Provides for compensation to any damages to holders of water rights. The responsibility shall be endured by the person who carries such violation that resulted in such damages.

Article (79):- Stipulates that as far as sources of water and its flowage and in relation to irrigation and its rights or customs, the provisions of the Civil Law shall apply.

Article (80):- Stipulates that in case there is no provision in this law (the Water Law). Then provisions of the Civil Law and the Principles of Shari'ah shall apply.

Annex 3: The Amendments to the Water Law No. (33) of 2002 as issued by law no (41) of 2006

The establishment of a new Ministry for Water and Environment necessitated the need to change and amend some articles of the existing Water Law No. (33) of 2002. Such amendments are as follows:-

1) **Article (2):-** in relation to definitions, the word ministry meant the Ministry of Water and environment and the Minister meant the Minister of water and Environment. Many articles were amended to replace NWRA to the Ministry so that the Ministry has the functions, but NWRA is the Executive implementing Authority.
2) **Article (3):-** This article stipulates the objectives and the general principles of the Water Law. The word (and management) is added to the objectives before it was not there.

Article (7):- This article provides for development, regulation and management of the water resources on the basis of water strategy to be proposed by the Ministry after submission from NWRA to be issued by cabinet decree. Such strategy shall be in accordance with policies, plans, and sector programs arising from it.

Article (25) in relation to sectors usages of water:-
In this article, MAI is no more responsible for drinking water of the rural areas. It is now the responsibility of MWE. Also, MAI must carry out its functions and duties as far as operation, maintenance its water structures and facilities and to regulate and rationalize usage of the water allocated for irrigation in compatible with the Local Authority Law and the water plan on the basis of the strategy.

Article (45):- This article was amended whereby drilling surface wells without prior licenses to obtain limited quantity of water from wells having sixty meters depth to the following:-
(having into consideration provisions of article (29) of this law, digging by hand wells to obtain specific quantities of water for drinking purposes provided that depth of such well shall not exceed sixty meter) so no drilling rigs to be used and water must be for drinking only.

Article (46) concerning protection of water and its environment from pollution:-
In this article it is added as no(6) (means of transportation and distribution of water for drinking purposes) to be subject to the system of criteria, general technical specifications along with (1) Drilling water wells (2) Locations and general designs of irrigation structures and water and treatment of water and water desalination stations (3) Prohibited space areas around wells, natural springs and upstream. (4) Drillers equipment, drilling materials and wells covers. (5) pumping machines.

Article (48):-
In relation to the protection of water resources from depletion and to rationalized its usages. Here it is amended by adding (the concerned Local Councils and Users) when establishing dams and diversion weirs and necessary structures for rain water catchment to have the utmost use of rain and spate water to charge ground water through its maintenance and operation with cooperation of the Local Councils and users. Also, it is amended to add the following in this article:-
(The technical supervision on establishment of water structures for any person natural or juridical for the purposes to recharge ground water).

Article (64) in relation to the procedures of inspection and penalties:-

In this article a new para. 2 is added to the article to stipulate the following:-
(Inspectors shall issue orders to stop the work that relates to the violation immediately after ending the recording of the minutes of the offence and its inspection and also to seize equipment and machineries of such work and to transfer the case of such violation and its seized equipment and machineries to the prosecutor general office to take the necessary legal measures in this respect).

Article (71) in relation to penalties and punishments:-
In this article imprisonment period is increased and fine amount is increased too for water offences as using water for other purposes than its intended purposes or taking out water from well before its registration.

Article (74) in relation to final and general rules:-
In this article, it is amended to stress upon that MWE shall undertake consultation and coordination with MAI and the Local Councils pertinent their functions and responsibilities as stipulated in this law.

Article (74) as repeated:-
This article is repeated as follows:-
(The Ministry shall have the right in the emergency cases in which it is expected that damages shall inflict people and properties of public and private, to take action to remove works and activities of such violations and to restore the situation as it was before the violation and by the method it deems fit and proper and to be on the expense of the violator and without awaiting results of the court decision in such violation, as such action is within the ministry jurisdiction. The ministry shall coordinate with other concerned parties. The by-Law of this law shall define such emergency cases.

Article (75) as repeated:-
This article is repeated as follows:-
The societies for the protection of water and the parties as assigned from the ministry and any natural or juridical person may submit civil suit against any natural or juridical person who caused through his action or omission of the rules of this law, damages to the water or its structures and facilities, including causing extravagant depletion of the water or its pollution.

Article (76):-
This article as amended relates to imposing fees as follows:-
(Upon submission of proposal by NWRA and after approval of the minister and with coordination of the concerned parties and in accordance with the legal procedures, fees may be imposed for the purposes that its amount shall be allocated to support development of the water resources and its conservation from depletion and pollution and to ensure fulfilment of this law objectives as follows:-

1)Fees on use of water beneficiary rights.

2)Fees on use of water for commercial purposes.

3)Fees for the protection of water from pollution as a result of drainage and the commercial and industrial waste. The by-Law of this law shall specify the rules procedures and measures that regulate collection and expenditure of these fees.

Annex 4: The Executive by-Law of the Water Law No. (33) of 2003

The Executive by-Law of the Water Law No. (33) of 2003 as amended issued by Cabinet Decree No. (112) of 2011:

A) According to the Water Law No. (33) of 2002, the Executive Regulation or its by-law of the law must be issued within six months of the issuance of the law. But this did not happen. In May 2003, a new government was established and new Ministry of Water and Environment was created. The establishment of the Ministry of Water and Environment necessitated amendments to the Water Law in particular some functions of NWRA to be assigned to the new ministry on planning, supervision and relationship with the cabinet.

Also, developments after the establishment of the new Ministry of Water and Environment such issuance of Republican Decrees transferring NWSA from the Ministry of Electricity to the MAI and then to MWE, as well as issuance of Republican Decree transferring Rural Water Supply Authority to MWE necessitated preparing draft amendments to the Water Law. This is the reason why the by-Law of the Water Law had not been issued as stipulated in the law.

The Executive by-law of the Water Law has been prepared taking into consideration the amendments to the Water Law submitted to the cabinet which have been approved by the cabinet issued by law by parliament as Act No. (41) of 2006. So, the Executive by-law of the Water Law has been issued on the basis of the new realities of the existence of new Ministry of Water and Environment with NWRA, NWSA, EPA, RWSA and Local NWSA as executive authorities of the new Ministry of MWE.

The Executive by-law of the Water Law specifies the following in relation to water irrigation use and management and water rights:

1) Article (5) provides that Wadis are common property for all beneficiaries and so wadis are not owned privately and as such the characteristics of customs and traditions as accepted and recognized as well as water rights which were recognized through succession in each region of the Republic shall be approved and accepted to continue provided that beneficiaries shall not create changes in the courses of floods which result in preventing natural water from flowing in their normal courses or to cause negative environmental effects in such courses of the wadis.

The state shall through MWE and MAI carry out any activities or take any measures in such Wadi for the benefit of the water users within the public interests as such:

a) Establishment of main and secondary irrigation systems and to clean the wadi beds and courses.
b) To divert the water from its natural courses.
c) Establishment of water monitoring and control stations and management and protection of such stations.
d) The conservation of water and control of water uses and its rationalization.
e) To take measures to protect from spate and floods.
f) To recharge ground water.
g) To transfer part of the water to renew and create life for pasture and grazing and natural parks whether temporarily or permanent.

All beneficiaries and water rights shall be subject to the rules that regulate it in the Civil Code and each case shall be treated separately subject to its legal status of the rights of land ownership and water use rights and subject to Shari'ah principles or custom upon which such water rights were established.

2) Article (6) of the Executive by-law provides that any beneficiary and user of any resource of ground or surface water resource whether through succession or transfer or acquisition must satisfy and fulfil the following conditions and measures:
    a) That such water right has accrued to him or acquired by him through legal means in accordance with the Water Law.
    b) He must not inflict any damage whether direct or indirect with the traditional and non-traditional water resources and the environmental systems related to it which may affect negatively upon the quantity sustainability of such resources or deterioration of its quality or which might cause obstruction or disruption of the equity of water distribution or which may damage the private and public interests at present or within the foreseeable future.
    c) The water user shall not sell his water right or dispose of it in a way that contradicts or violate the rules of the Water Law and this Executive by-law and that he must take into consideration the other interests as servitude rights of others attached to their water right or any other interest or servitude right recognized by law or by custom.
    d) The water beneficiary must bear the same duties imposed upon other beneficiaries in relation to protection from spate and floods and irrigation system and development and rationalization of water resources and its conservation and protection from overexploitation and pollution.
    e) The water beneficiary shall not exploit the groundwater resources except with special licenses permitting such action in accordance with the rules of the Water Law and this Executive by-law.
    f) The water beneficiary accepts the right of the state to regulate the water beneficiaries' rights and duties in using their water rights and the state right to control and monitor the methods of exploitation of such water resources and its structures located in the private and public properties. The state can impose measures that include reduction of the allowed water to be utilized when such measure is necessary to be taken for the purpose of conservation or the sustainability of the water resources and for the fairness and equity of water distribution or when it is necessary to allocate water for drinking and for household consumption on the expense of other purposes.
    g) The water beneficiary must register his existing water right at present and which he might acquire in future and recording as such in accordance with the system, which NWRA prepares for this purpose in accordance with the law and this Executive by law.
    h) The water beneficiary shall bear the responsibility and liability for any damages that he might inflict with the water and environment or with other interests and water rights. He shall pay the fines and the fair compensation in accordance with the law and other prevailing laws.

B) The definition of WUAs is clarified here as amended by the law issued in 2006. This By-Law stated that WUAs are all beneficiaries and users of water who regulate their efforts for the purpose of participation in the management of water resources and participate in managing financing, maintaining and operating projects and structures of water and irrigation in accordance with the rules of this by-Law and in compliance with the existing laws and regulations. Also, the definition of the Articles of Associations or the basic regulation of WUAs, is defined as the Regulation which is issued and approved by the concerned ministry to compose and to regulate of such groups, association unions of beneficiaries and users of water.

C) Again article (6) stressed upon the word management of the water resources besides regulating it as amended in 2006 and stated that MWE shall regulate and manage water resources on the basis of integrated water resources management whether traditional or non-traditional in order to secure water necessities of quantity and quality as required by different users and to allocate it among them in accordance with the rules

of the law and this by-law on the light of water strategy to be based on the principle of management of water supply and demand.

Annex 5: List of interviewees

Interviewees Sana'a

No.	Name	Occupation	Location
	Abdul Salam Al Jerafe	Court judge	Sana'a
Case 1. Shahik dam			
	Ali Faker	Shaik/ farmer	Shahik
	Saleh bin Saleh al Himey	Shaik/ farmer	Shahik
	Ahmed Mohamed Hussain Al Nehmi	Shaik/ farmer	Shahik
	Saad Al Weshah	Shaik/ farmer	Tanim
	Ali Abdullah Dahak	Shaik/ farmer	Tanim
	Ahmed Bin Ahmed Mokbil	Shaik/ farmer	Tanim
	Abdulah Ali Al-Yamani	Agriculture equipment supplier	Sana'a
	Fakhir Ali Fakhir	sheikh	Shahik
	Husein Ali Qassem Qataran		Shahik
	Husein Ali Annehmi	Farmer	Shahik
	Abduh Ahmed Qataran	Farmer	Shahik
	Ahme dSaleh Alheiri	Farmer	Shahik
	Abdullah Qassem Qataran	teacher in local school	Shahik
	Mohammed Ali Fakhir	farmer	Shahik
	Ali Al-Ofairi	elder	Shahik
	Naji Naji Qassem	Farmer	Shahik
	Abdullah Saleh Fleih	sheikh	Tan'im
	Abdulmalik Husein Dahhaq	school principal	Tan'im
	ABdulwahab Senan	Farmer	Tan'im
	Maher Taher	farmer	Tan'im
	Aamer Abullah Fleih	son of the sheikh	Tan'im
Case 2. Arrowdah			
	Saleh Azendani	Farmer	Arrowdah
	Ahmad M. Al-Hela	Farmer	Arrowdah
	Fouad M Al-helah	Farmer	Arrowdah
	Yahay Ali Helah	Farmer	Arrowdah
	Ali Al Abassi	Farmer	Arrwodah
Case 3: Bani Matter			
	Fadel S. Jarallah	Association chairman	Bani Matter
	Jamel Y. Hezam	Farmer/ Jalal	Bani Matter
	Adnan M. Al-kurebi	Farmer/ Jalal	Bani Matter
	Hussen M. Alhurebi	Farmer/ Jalal	Bani Matter
	Naje Ali Awad	Farmer/Bait Awad	Bani Matter
	Mubak M. Mubark Al Habsi	Farmer/Bait Habs	Bani Matter
	Mohamed M. Al-Mahybi	Farmer/Bait Mahyb	Bani Matter
	Abdo M. Al-Habesi	Farmer/Bait Habs	Bani Matter
	Yahya Ali Mohamed	Farmer/Alkarabah	Bani Matter

Interviewees Wadi Seham

List of interviewees: 1 April 2014, Hodedah

	Name	Position
	Dr. Abdul Salam Atayb	Chairman of TDA
	Yahya Al-Huzaimei	
	Hazamaah	Agent of Hassan Swaid
	Adel Abed Al Moghnei	Engineer and operator of the channel

List of Interviewees: April 9, 2014

	Name	Position
	Hassam Mohamed Sagheer	Farmer affected by Ad-Dabashiyah conflict
	Hassan Naji	Guard who works for Al-Huthiaiqi-Ad-Dabyashiyah
	Ameen Qaed Saleh	Director of Maintenance at TDA
	Omer Abdullah	Farmer, agent for Bani Swaid
	Mohammed Saad	Farmer from Bani Swaid

List of Interviews April 12, 2014

	Name	Position
	Hadi Hague	Sheikh from Wadi Moore
	Abdulkareem Qaserah	Sheikh Dhaman of Wadi Seham
	Omer Ahmed Obaid	Akel of Alameryah, Wadi Seham
	Mohammed Ashar'abi	Akel from Wadi Seham
	Abdurrazq Abdurrahman	Farmer-Wadi Seham
	Abdullah Abdulkareem Qaserah	Sheikh Abdulkareem's son who also works for security

List of Interviews April 14, 2014

	Name	Position
	Abdulmughni Mansooor Hajeb	Project manager of TDA
	Haidar Thawm Banna	Akel of Alfalafelah area (47 villages) General secretary of Water Users Association
	Abdulwali Khaled Saif	Director of Water at TDA
	Ahmed Quhri	Agriculture and Environment consultant
	Person 83	Side 2 of the Bani Swaid conflict case-Farmer
	Hadi Hague	Prominent sheikh from Wadi Moore
	Salem Taher	Farmer affected by Huthaiqi blockage of the canal

Interviewees Ta'izz

List of Participants April 15, 2014:

Name	Position	Place of meeting

	Abdussamad Shujaa	Head of NWRA branch in Taiz	NWRA Taiz
	Shaeif Addakam	District Director of Khadeer district	His office in district
	Person 94	Side 1 of the Halhalah conflict case	His house in Halhalah
	Hassan Mohammed Qassem Abdussamee Mohammed Qassem Abdullah Mohammed Saeed (the Qassem's uncle)	Side 2 of the Halhala Conflict case	Hassan's house in Halhalah- Qat chew- there were also at least another 10 men in the qat chew who did not participate in the discussion
	Abdussalam Ali Othman	Local Farmer who used to be part of the dispute	Near his well
	AbdulSamad Shojaa	NWRA office director, Taiz	
	Kaled shoujaa	NWRA staff, Taiz/ Quradah citizen	
	Nour Aden Alkobate	NWRA staff, Taiz	
	Hamoud AlHamoudi	District Director	Saber Almawadem
	Ahmad Naje Asabri	Quradah citizen	Rural water office, Taiz

List of Participants April 16, 2016

Morning Meeting (9:30-11:30 pm): Focus Group Discussion on Water and Conflict Issues
Place of meeting: District Council Facility- Alma'aafer district

	Name	**Position**
	Abdullah Assarari	District Director
	Abdullah Mohammed Saif Assoroori	Secretary General of Local councils
	Mohammed Ali Far'a	Local council member Head of Service Committee
	Ahmed Hazza'a Othman	Local council member- head of Planning and Development
	Abdullah Assohaibi	Local council member
	Mohammed Abdo Mohammed	Secretariat director of local council (local council admin staff)
	Abdulwali Abdulhafeez	Manager of information and statistics at local council
	Mohammed Nu'man	Manager of Al-Jebzah water project
	Najeeb Ahmed	Financial manager of Al-Jebza water project
	Shaker Mostafa	Manager of Assawarah water project
	Anwar Ahmed	Annashamah water project
	Abdulhameed Aqlan	Association of Water Users
	Abdulhameed Aqlan	Head of Alwahda Association (NGO) in Almaafer
	Ala'a Saif Moqbel	Security Officer- Security Directorate of Al-Maafer district
	Abdussalam Al-Eliyani	A local affected by water conflict

Afternoon Meeting: Bani Yousof case: Participants from Qihaf village, men Focus group discussion:

Name	Position
Abdurrahman Ahmed	Adel (Akel) of Qihaf village
Sameer Abdulbaqi Saif	Teacher
Abdulhafeeth Abdo Mohammed	Air force Officer (a local resident)
Abdulhaleem Sharaf Saeed	Teacher
Mohamme Ahmed Saeed	Teacher
Abduljabbar Derhem	Farmer
Abdulmajeed Shaeif	Farmer
Hameed Ahmed Thabet	Air force officer (local resident)
Basheer Mokred	Driver
Faheem Mohsen	Member of development committee
Abdulqadoos Sharaf	Teacher
Abduljabbar Mokred	Teacher

Afternoon Meeting: Bani Yousof case: Participants from Qihaf village, women Focus group discussion:

All the women were housewives; none of them were working women. Age ranged between 20-55. Most of the women were too shy to contribute to the discussion.

Name	Position
Tahani Mohammed Saeed	
Ayat Ahmed Sufyan	
Ghada Haza'a	
Amani Ali Naji	
Rawal Mohammed	
Rawdah Mehmood	
Nadheerah Othman	
Mardhiyah Taha	
Boshra Abduljabbar	
Azizah Abdulazeez	
Mohsenah Mokred	
Rimal Mohammed	
Amthal Ahmed Sufyan	
Tareem Abduljabbar	
Asmaa Abdulqader	
Sukaina Abduljabbar	
Aalemah Abdullah Numan	

Annex 6: Report of the stakeholder consultation meeting in Amman

On 5 and 6 June in Amman, The Hague Institute's water diplomacy team met with a variety of water stakeholders from Yemen, as well as Ms. Zumreta Jahic, First Secretary at the Dutch embassy in Yemen (project funder), in an intensive and interactive workshop.

The workshop took place in the context of the project The Political Economy of Water Conflicts in Yemen, for which the team is in the process of finalizing the report after several months of desk research and field work in three areas (Sana'a basin, Wadi Siham area, and Ta'izz), in collaboration with both consultants based in Yemen and Dutch partner organizations.

The twelve stakeholders from Yemen represented a diverse group in the Yemeni Water Law, policy, supply, and demand landscape. Among them are farmers and other small water users, tribal leaders, the Vice-President of the Supreme Court of Appeals, representative from the Ministry of Water and the Environment, regional and local development authority representatives, representative from the National Water Resource Authority (NWRA), and academics experienced in researching water conflicts within Yemen. Many have been directly affected by water conflicts (often with several victims) and some have been actively involved in mediating such conflicts.

It became clear during the meeting that various stakeholders differ in their perspectives on the causes of the lack of access to water and water availability (and therefore conflicts) and on possible solutions. Issues debated include:

- the perceived lack of coherence between customary and formal law;
- the variable role of the court and of tribal leaders in solving water-related disputes;
- the gap between the objectives of various water-related authorities and the implementation of such objectives;
- the overlapping authority between different governmental agencies;
- disagreements over the responsibility of maintaining water-related infrastructure; corruption and the patronage system; and
- the impacts of international donor-funded projects.

A common recognition at the meeting was that conflicts over water in Yemen are caused by larger problems, of which the root causes need to be addressed. Despite still being a country in political turmoil, it is never premature to highlight the development and strengthening of the rule of law and institutions. Water problems are not confined to the water sector. Water scarcity, in combination of decreasing profits from cash crops, has led to farmers leaving the agricultural sector to join other sectors or become unemployed, to illegally enter Saudi Arabia as migrant workers, or even to join armed groups. Water scarcity should therefore be seen as a broader problem than only relating to drinking and irrigation.

Due to the lack of clarity in the application of law to water use and conflicts, the courts have variable roles in solving water conflicts. Currently, the majority of water conflicts are settled within the communities by Sheikhs. Sheikhs are instrumental to conflict resolution due to the respect they receive and their wisdom on traditional rules. However, Sheikhs could also be counterproductive to conflict resolution when they adopt different roles such as owners of oil companies, project

contractors, and military leaders, the interests of all of which may be at odds with those of the tribe they ought to represent.

For more complex cases, Sheikhs also seek technical advice from judges and National Water Resources Authorities. Only a small percentage of conflicts, which Sheikhs fail to resolve and which sometimes lead to violent clashes, end up in court. It is estimated by the Vice-President of the Supreme Court of Appeals that 2500 people are killed yearly, due to water-related conflicts. As these cases appear before the court, criminal law is applied rather than Water Law, given the serious implications. Hence, the water issue itself is not being addressed in court, but only the consequent criminal offence. It also means that many criminal cases in Yemen are water-related but not officially labeled as such.

While international donors contribute to reducing the number of water conflicts, they can also be part of the problem, particularly when their intervention comes from the top down. To avoid undesirable side effects of donor activities, equitable distribution of water should be a component in relevant donor-funded projects in order to win the support of and benefit local stakeholders. Moreover, conditions could be attached to awards to ensure local authorities' compliance with the laws and the involvement of judiciary and security authorities in law enforcement. Additionally, due to the general distrust in politicians in Yemen, more direct engagement by donors with local communities may be one way to achieve higher accountability and more effective use of the funds.

Finally, donors acting as supervisors of community-level dispute resolution processes, may enhance the perceived impartiality of the process.

Stakeholder Meeting on
The political economy of water conflicts in Yemen

Amman, 4-6 June 2014
Landmark Amman Hotel & Conference Center

Agenda

Wednesday 4 June

20:00		*Dinner with all participants to get to know each other*

Thursday 5 June

9:00-9:20	Ms Zumreta Jahic	Opening speech with a focus on the work of the Dutch Embassy in Sana'a
9:20-9:40	Dr. Patrick Huntjens	The Hague Institute of Global Justice: program of work
9:40-10:00	Rens de Man	The research project on 'Water conflicts in Yemen'
10:00-10:10		Questions and Answers
10:10-10:30		*Coffee and tea break*
10:30-10:50	Faisal Abdullah Saif Ahmed	The role of the Ministry of Water and Environment in water conflict resolution
10:50-11:10	Yahia Mohamed Kaid Al - Mawery	The role of the courts in water related conflicts
11:10-11:30	Fadel Mahmood Ali Manea	Shari'ah law and mediation: experiences
11:30-12:30		Group discussion
12:30-14:00		*Lunch*
14:00-14:20	Mohammed Al Suneidar & Abdullah Al Kinda	Introduction to the case study research carried out: context and experiences
14:20-14:40	Abdullah Saleh Mabkhoot Fulaih	The Shahik dam conflict: experiences (including time for Questions and Answers)
14:40:15:00		*Coffee and tea break*
15:00-16:00	Abdulmughni Mansoor Ali Hageb Haider Twm Bin Saeed Hasan Omar Abkar Qadhi	Combined presentation on the conflicts in Wadi Seham: context, stakeholders, and solutions tried
16:00-17:00		Group discussion on the cases in Sana'a and Wadi Seham
19:00		*Dinner*

Friday 6 June

9:00-9:20	Nasser Mohammed Nasser Al Yazidi	Review of lessons learned on Thursday 5 June
9:20-10:00	Abdulsamad Mohammed	Combined presentation on the conflicts in Taizz: context,

	Yahya Ismail Abdullah Ahmed Abdo Sarari	stakeholders, and solutions tried
10:00-12:30		Drawing recommendations for solving water related conflicts
12:30-14:00		*Lunch*
13:00		Departure to airport for Dutch participants
18:00		Departure to airport for Yemen participants

Speakers and participants

Zumreta Jahic

First Secretary at the Embassy of Kingdom of the Netherlands in Sana'a, Yemen. Ms Zumreta Jahic has in her career as Policy Advisor and First Secretary at different posts, developed a strong expertise in environmental issues, water, green growth/ green economy, sustainable development and water diplomacy. At the Embassy in Sana'a Ms Zumreta Jahic is responsible for the Water Programme.

Patrick Huntjens

Dr. Huntjens is Head of Water Diplomacy at The Hague Institute for Global Justice. He has 15 years of professional experience in the field of water diplomacy and water governance, working in over 35 countries in the public, private, non-profit, and academic sectors. Dr. Huntjens is responsible for several international projects on water diplomacy, water governance and climate change adaptation in the Middle East, South East Asia, Eastern Europe and Africa. Dr. Huntjens is project director of *'The political economy of water conflicts in Yemen'* research project.

Rens de Man

Rens de Man is a researcher for the Water Diplomacy Consortium at The Hague Institute for Global Justice. He specializes in social problems around land and water use, food security, natural resource management institutions, and sustainable development. Mr. De Man has 10 years of professional experience on complex issues involving land and water use, building partnerships and seeking sustainable solutions to support environmental and social needs. His international work includes India, Costa Rica and Cambodia. Rens de Man is project manager of *'The political economy of water conflicts in Yemen'* research project.

Ting Zhang

Ting Zhang holds a master's degree in Sustainable Development from Utrecht University, with a focus on Environmental Policy and Management. During her studies, she became increasingly interested in the research fields of environmental governance, corporate social responsibility, and the science-policy interface. Her master's thesis dealt with the risk communication of novel technologies, particularly carbon capture and storage in the Netherlands. She also holds a bachelor's degree in Environmental Geography and International Development from the University of East Anglia in England, which centred heavily on resources and energy management, especially in developing countries. After graduation, she was actively involved in supply-chain sustainability research through internships and volunteering work at various non-profit organisations.

Khaled Shorman

Khaled Shorman is a senior consultant and trainer in the fields of conflict resolution, project management, and communication strategy. He has about 20 years of progressive experience in civil society, community development and social work. He is manager of Masar, a regional NGO based in Jordan and working in the Middle East in the fields of environment, peace, democracy, youth activism, media and related fields.

Masar was established in 1994 and implemented a number of projects in the fields mentioned above and mainly targeted youth, youth leaders and journalists in Jordan, Israel, Palestine, and Egypt as well as Europeans to work on common challenges and opportunities. Mr. Shorman has also worked as a journalist for Jordan Radio and TV and also was regional coordinator for the biggest EuroMed media-training project between 1994 and 1999. The project covered many countries in the East Mediterranean region and Europe. Besides working in Masar, Mr. Shorman is also a regional expert on a new EU project called Cross Border Cooperation in the Mediterranean Sea Basin region. His provides consulting to beneficiaries (NGOs, public and private sector and educational organizations) in Jordan, Syria, Lebanon and Palestine.

Abdullah Saleh Mabkhoot Fulaih

A Sheihk from the area of Shahik dam. He is one of the two conflict sides over water in region of Shahik dam, and is representative of the conflict-affected area in the dam.

Fadel Mahmood Ali Manea

He is the official water structures responsible in the Union of WUAs in Yemen. He work as coordinator and official mediator for any water conflict. Shikh Fadle is also a tribal leader in Bani Hoshish – Sana'a. He holds a Bsc degree in Shari'ah law, he also interested in the problems of water and conflicts in Yemen.

Yahia Mohamed Kaid Al -Mawery

Vice-President of the Supreme Court of Appeals, approval, as he is a member Supreme National Committee for addressing the issues of revenge and murder, including the issues of water and the resulting conflicts and disputes lead to revenge and murder, as he is a member of the Committee on Islamic Shari'ah Codification in the House of Representatives, including the provisions relating to water in Islamic Shari'ah law.

Abdulmughni Mansoor Ali Hageb

A Director of designs and project supervision department in Teham Development Authority (TDA). He is the manager for Wadi Siham development project, and responsible of water distribution among farmers and beneficiaries. He take the lead to resolve all disputes and conflicts arising over water in Wadi Seham.

Abdulsamad Mohammed Yahya Ismail

General Manager of NWRA branch in Ta'izz. Also served as manager of the Licenses and Awareness depertment of NWRA branch in Sana'a, which is responsible for issuing licenses for the drilling of wells and deepened. As he is now the head of NWRA branch in Ta'izz, he is responsible of water issues in the region and resolving disputes arising from them.

Abdullah Ahmed Abdo Sarari

He represents the local authority of Ta'izz, where he is the Director General of the Directorate Almaafr Ta'izz province. He is first responsible in the directorate for resolving disputes including water conflicts.

Haider Twm Bin Saeed

A Farmer in Sakia Valley in Wadi Siham. He is a member of the Water Users Association of Sakia in Wadi Seham. He is one of the water conflict sides in Wadi Seham. He represents the downstream area of the valley He is one of those who affected by the water conflict in that region.

Hasan Omar Abkar Qadhi

He is the Chairman of Arad al Janitaeen agricultural association in Wadi Seham. He represents one of the two water conflicts parties in the Wadi. As many other small water users he affected by the establishment of

number of diversion dams at the upstream area of the Wadi. He represent the farmers at the middle zone area of Wadi Seham.

Faisal Abdullah Saif Ahmed

Director General of Planning and International Cooperation - Ministry of Water and Environment. Responsible, amongst others for: 1. The preparation of plans and programs quarterly and annual Ministry; 2. Coordination and collection plans and strategies on water and the environment; 3. Development of policies and indicators related to water and environment sectors

Nasser Mohammed Nasser Al Yazidi

February 2014 till now: freelance consultant, IWRM and institutional development. Prior to that:

- September 2007-February 2014: senior advisor /Advisor, GIZ-comp.4, DWRM Sana'a (Decentralized Water Resources Management)
- 2004 July 2007: the facilitator of Sa'adah Water Basin Committee, NWRA/KFW, Sa'adah
- 1997-2004: Sector Head, the Monitoring, awareness and Water Rights, NWRA, Sana'a,
- 1990-1997: General Director, Water Resources Directorate, Ministry of Agriculture and Irrigation (MAI), Sana'a
- 1986-1990: General Manager and Chairman of the BOD, the Public Drilling Corporation, Ministry of Agriculture & Agrarian Reform (MA &AR,) Aden
- 1982-1986: Manager of the Nisab and Markha Hydrogeological Study Project, MA&AR Aden and Shabwah
- 1980-1982: Geologist, Water Resources Division in the Irrigation Directorate of MA&AR, Aden
- 1979-1980 Geologist, Ministry of Oil and Mineral Resources, Aden

Mohammed Al Suneidar

Mr Al Suneidar worked in different positions at the preparation and management of development programmes and projects, including institutional and policy analysis, and communication with international agencies and preparation of implementation and monitoring plans. Mr Al-Suneidar currently works as Deputy Chairman at the General Tourism Development Authority (GTDA). In the past he worked amongst others as general manager at Sustainable Environmental Management Program of UNDP, and as general project director of the Institutional Development for Public Administration Project of IDA.

Abdullah Al Kanda

Dr. Abdulla Saeed Al-Kandah

- A professor in college of law and Shari'ah in the Sana'a University.
- General director of legal affairs in Sana'a University.
- A professor of law in Al Andlus University.
- A lecturer of law in the Water and Environment Center in Sana'a University.
- Wrote many researches about Yemen constitution.
- The constitutional development in Yemen since 1948 till 1980.
- The executive powers of the president of Yemen 1948-1987.

Annex 7: Administrative and institutional water framework

Framework	Reference to Shari'ah or customary rights
Customary & Traditional Rights	Strong
Shari'ah Law	
Constitution	Islamic Shari'ah is the source of all legislation (art. 3)
Civil Code	Strong; water use must never conflict with the Shari'ah law (art. 1359)
Water Law	No mention of Shari'ah law but does recognize traditional rights and pre-existing customs

Framework	A. Water ownership right #Legal status of water ownership
Customary & Traditional Rights	#Res communis #Private ownership of contained water
Shari'ah Law	#Mubah or res nullius, water is of nobody. #Free access for all people and community #non-salable #public-owned principle and non-salability do not apply when water is appropriated for drinking and domestic purposes #water may be contained in wells and pipes and sold
Constitution	State is owner of all natural resources to use for 'common good' (art. 8)
Civil Code	#Mubah or res nullius, water is nobody's #Water is originally for all (Art. 1366) #Water may not be sold (originally) #Water may be appropriated, if needed for drinking and domestic use. #Water may be contained (wells, pipers) and sold # #In relation to irrigation Water is entitled to whoever reaches it first (art. 1360)
Water Law	#Public property, subject to administration by State #No ownership possible but through means of conveyance or acquisition (Art. 6) #streams of the valleys are common property (art. 5) #Private property subject to State's administration (art. 6)

Framework	Conditions for water ownership
Customary & Traditional Rights	
Shari'ah Law	#Four types of water sources: a. water enclosed in man-made receptacles, b. water in wells, cisterns and springs, c. water in small rivers or stream which belongs to a specific community, d. water in great rivers. #Only water in privately owned containers separated from source may be owned. -The rest is publically owned
Constitution	#Private ownership is not possible as its owned by the State #exploitation and utilization of water resources is subject to permissions and regulations by the State
Civil Code	#Water is not owned as private property except when transported or contained in receptacles taking water from its source (art. 1336)
Water Law	#Only use rights are given based on the laws itself and permits. #The States distinguishes between: a. right to use water in a aquifer or a reservoir, b. traditional rights to the water use, c. traditional rights to water of natural springs.

Framework	B. Water Diversion and usufruct #Acquisition of diversion right

Customary & Traditional Rights	#Rights accumulated by an individual, family, tribe or collective through time for water to develop agricultural land. #Traditional diversion rights are seen as servitudes to the land owned by the rights holders. #In relation to surface spate water, upstream riparian enjoy priority in irrigating land. #Downstream riparian cannot be denied surplus water.
Shari'ah Law	
Constitution	#All water resources including ground water and surface water are property of the State. (article 8) #State may award concessions related to exploitation of natural resources (article 18)
Civil Code	# Water is the right of whoever reaches it first and is a quantity which suffice him, even if taken from with a property (of others) (art. 1367) #'non-appropriated' water may be claimed for appropriation even if taken from within property of others #Claims are recognized by seniority #The quantity of claim is determined by sufficiency to appropriator #It is prohibited to enter a neighbors land to water without the owner's permission or consent, unless such entry based on a custom #any diversion of water from a source should not cause any harm to existing users/ owners unless the water is taken for drinking or clean-up for praying.
Water Law	#Water Law recognizes traditional diversion rights as long as water is used for irrigation and in connection with agriculture land. (art. 28, 29) #All usufruct and diversion rights (except the traditional ones) as subject to registration.

Framework	**Selling and transferring of diversion and usufruct right**
Customary & Traditional Rights	
Shari'ah Law	There are two schools of thought: a. Water rights (diversion and usufruct) belong to the land itself and not the owner. Therefore when land is transferred water rights transfer with it automatically. b. Transfer of water rights need explicit statement otherwise land will be transferred without water rights and the last owner will be owner of those rights.
Constitution	#Transferring and selling of usufruct and diversion rights are to be regulated by specific laws
Civil Code	#Land ownership includes water rights. But usufruct rights may be separated from land through agreement. (art. 1163) #the irrigation right is servitude to the land and thereby inheritable. This right cannot be sold separate from the land (art. 1370)
Water Law	Rights are gained through permit systems with a concession relating to utilization and development

Framework	**Conditions for losing the diversion right and usufruct**
Customary & Traditional Rights	
Shari'ah Law	#As water rights are appurtenant to land, they cannot be lost. #In certain cases however they cease to exist: a. the land is washed away or buried b. the intake structure is destroyed or washed away c. the beneficiary abandoned use d. the source of water has been depleted
Constitution	
Civil Code	

Water Law	#According to article 38 licenses for all water resources are cancelled by the force of law for the following reasons: a. when drilling works have not commenced within a year of issuing the license b. if the license is used for other purposes than issued for c. if the conditions of the license have been violated d. when license is assigned to other without permission of Authority. e. If pollution or deterioration of source is observed (art. 40) #When application provided false information #In the case public interests need so

Framework	**C. Water use #Priority of use**
Customary & Traditional Rights	1. Drinking purposes. 2. Irrigation
Shari'ah Law	1. Drinking and domestic purposes. a. Human (right of thirst), b. animal, c. domestic use 2. Irrigation #Water for drinking purposes may be taken from any source. #Refusal to share water = haram #Use and sharing must be reasonable and not cause any harm to others.
Constitution	Priority for 'common good'
Civil Code	#According to art. 1367 first come, first served #Individuals may only take from other's property by consent or custom (right of thirst) #Taking water for drinking, domestic and religious purposes may not harm owner property
Water Law	1. Drinking and domestic purposes (art. 20) Animals, public utilities, irrigation (art. 21) Minimum environmental requirements

Framework	**#Quantity of use**
Customary & Traditional Rights	
Shari'ah Law	#Wasteful water use = haram #Water rationing = virtue #For spate irrigated land, the quantity of use is equivalent to a layer of water at the height of an ankle.
Constitution	
Civil Code	#Quantity to divert should be assessed on the basis of the quantity used when the land was first reclaimed.
Water Law	#Water Law recognizes traditional diversion rights for irrigation use subject to registration with the Authority and preserves rights as long as the purposes of use and quantity of water do not change. #The amount and use of water are specified in license (art. 37)

Framework	**Place of use and sharing (can water be used and shared wherever the holder of the right desires)**
Customary & Traditional Rights	#It is allowed to pump ground water from one wadi to another
Shari'ah Law	#Surface water used for irrigation purposes of the land it is located at cannot be transferred to other land
Constitution	#
Civil Code	#In principle follows Shari'ah Law, that irrigation water cannot be transferred to other land. #The obligations of the servitude right may however create obligations for the benefit of others. #Analyses of servitude rights may show feasibility of transfer of surface water of surplus from one place to another.

Water Law	#the Authority can issue license for pumping specific quantities of ground water or surface water from one basin/area to another. (art. 50) According to the following conditions: a. the transfer process may not jeopardize the need for drinking and domestic use. b. the purpose for transfer is for drinking and domestic use c. stakeholders should be consulted. d. Damages should be fairly compensated.

Framework	Burden of sharing among users
Customary & Traditional Rights	
Shari'ah Law	#If water is privately owned by a single person then he has the right to utilize it as he wishes #if water is owned by a group, water must be equally divided
Constitution	
Civil Code	
Water Law	#The Water Law regulates the conditions including the amount used from each sources #The Water Law calls for the establishment of associations, groups and committees (art. 10)

Framework	D. Water administration #Water allocation systems
Customary & Traditional Rights	
Shari'ah Law	
Constitution	
Civil Code	
Water Law	# No beneficiary may exceed the amounts or purposes spelled out by the Authority (art. 37) #the demand and supply control and allocation of water at the local and community level is managed by community-based organizations

Framework	Operation and maintenance
Customary & Traditional Rights	
Shari'ah Law	#The rules concerning maintenance and operation have been formalized in the Civil Code
Constitution	
Civil Code	#Art. 1172: the partners in a canal or drain are obliged to do the necessary repairs which must be done to make it usable or to prevent its harm to other #Art. 1369: if the owners of an irrigation right do not agree with respect to carrying out the necessary repairs of their common channel, then they may be forced, upon request from any one of them, to do these repairs on a pro-rata basis
Water Law	#the Water Law put emphasize on community participation in operation and maintenance of water structures (art. 10, 18) #Community based organizations such as WUG and WUA are responsible for developing rules and regulations to manage, operate and maintain their structures.

Framework	Organization of users
Customary & Traditional Rights	#Surface water: most elaborate system of organization #Groundwater: informal mechanisms with no limitations on quantity

Shari'ah Law	See Customary rights
Constitution	
Civil Code	
Water Law	#The Water Law encourages decentralization and community participation #An officially registered WUA is a prerequisite for participation in irrigation management #The WUA provides: a. self-regulation and enforcement of groundwater rights b. implementation and management of ground water schemes

Framework	Quantity and quality protection measures
Customary & Traditional Rights	See Civil Code #the recognized custom for distance between deep well is 500m
Shari'ah Law	See Civil Code #the pollution of water is prohibited by Shari'ah but knows not further specifications
Constitution	
Civil Code	#Several provisions in the Civil Code stem from customary rights and Shari'ah law such as #Consideration must be given to the separation distance from a neighbor's property (art. 1181) #owner of a pre-existing water sources such as a well may construct protection area around the well (art. 1185)
Water Law	#The NWRA has the power to protect water sources from pollution and depletion (art. 46, 54)

Framework	Conflict settlement procedures
Customary & Traditional Rights	#Systems applied in enforcement Water Law: a. Judiciary: often lack capacity and is lengthy b. Arbitration #legal arbitration #custom tribal arbitration: commonly used in rural areas. Starts with village aqil, followed by sheiks or court
Shari'ah Law	See Customary Rights
Constitution	See Customary Rights
Civil Code	See Customary Rights
Water Law	See Customary Rights

Framework	Enforcement Procedures
Customary & Traditional Rights	
Shari'ah Law	
Constitution	#Special courts are often established by Authorities such as the president
Civil Code	
Water Law	#the staff of the NWRA has the status of judicial enforcement officers (art. 64)

Annex 8: Summary of the case studies

Case 1	Sana'a: Shakik Dam
Parties	Shakik village verus Tan'im village
Conflict	The conflict concerns the user rights of the lake water, the amount and share of each village to the lake water, as the land was formerly common land. The people of Tan'im started using pumps to withdraw water from the lake, as they claimed that the dam prevents the flood and baseflow from reaching their area. The conflict began after warnings from the Shahik people were ignored.
Applicable local traditional and customary law	Traditional and customary law: Urf. Especially regarding floods and surface flow
Formal law	No use of any kind formal law could be identified
(Judicial) measures taken	Mediations by local tribal sheiks of Bani Sehaam, as both villages are part of this greater tribal community. They tried to solve the conflict through a customary law process of arbitration, but it failed as Shakik rejected the verdict.
Outcomes	An agreement between the people of the villages was reached without intervention from the official government or tribal mediators, but through mediation of a friend of one of the parties.
Remaining (judicial) problems	- There is no knowledge of the Water Law - The enforcement of traditional laws has deteriorated since 2011 - There is distrust in sheiks as tribal leaders because of their involvement in political parties - There is a lack of knowledge of customary law by the new tribal leaders
Case 2	Sana'a: Arrowdah
Parties	A new land owner who established a grape farm versus older land owners in the town of Ber Julah/ Arrowdah
Conflict	The grape farmer diverted water from a flood to irrigate his land, thereby violating traditional arrangements regarding the use of the flood according to the Ber Julah landowners, as they were the older landowners.
Applicable local traditional and customary law	The rule 'Ala'ala Fala'ala'. According to this rule, those who are in upper lands have the right to irrigate first, but new users in higher areas have to respect the older claims of those in lands below them.
Formal law	No use of any kind formal law could be identified
(Judicial) measures taken	The new land owner raised the issue with the local community heads, who called a meeting between the parties
Outcomes	An agreement was reached that the new owner could irrigate his land after the older established farms had done so
Remaining (judicial) problems	- There is no knowledge of the Water Law nor the NWRA regarding the regulation of floods - There is no real enforcement of any type of law since 2011
Case 3	Sana'a: Bani Matar

Parties	Upper stream village of Galal versus lower stream villages (Al Kharabat, Mahiab, Bait Awad and Bait Habes)
Conflict	The Galal village dug wells for drinking water at the upper location of the Ghail Mahiab stream. The lower stream villages claim that the digging of these wells was the main reason that some of their wells stopped producing water, thus loosing their main water source for drinking and irrigation.
Applicable local traditional and customary law	Traditional rules of 'Urf' apply, but it is not clear which rules. According to one partu a technical feasibility study on future well development was carried out in the past, but there is disagreement between the parties over the existence of these documents. Finally, they use general rules of Shari'ah law for regarding drinking water: water is 'allowed for all human', thus for human use in general
Formal law	No use of any kind formal law could be identified, but the parties know the NWRA.
(Judicial) measures taken	The parties referred the conflict to mediators, who tried to solve the conflict through tribal customary rules. The issue was also raised to the NWRA and it was accepted that their judgment, which they can give by setting up a specialized committee, will be final and accepted
Outcomes	NWRA has sent a specialized engineer to analyse the situation, but they are awaiting the outcome of the NWRA's report.
Remaining (judicial) problems	- There is no awareness of the Water Law by local authorities - There is reluctance to put conflicts in front of courts
Case 4	Wadi Seham: Al Dabashia canal
Parties	Person 81 and others versus Tehama development Authority (TDA) and downstream farmers
Conflict	The TDA wanted to extend the Debashiya canal in order to reach the farms previously left out by the project. Person 81, whose land is already at the end of the canal, is against prolongation as he fears that the water in the canal will decrease. Therefore he blocks the water flow to downstream users.
Applicable local traditional and customary law	The most important rule in the entire Tehama region for surface flow is Al ala fal Ala; the TDA claims to operate the canal distribution system according to this rule, but is also accused of mismanagement
Formal law	No use of any kind formal law could be identified
(Judicial) measures taken	TDA was involved by the downstream farmers to mediate with person 81, but person 81 did not cooperate. The TDA sent complaints to the district director, but without result, as person 81 has connections with influential people in the goververnment or security backing him up.
Outcomes	No outcome yet
Remaining (judicial) problems	- There is no clear system of rules dealing with new land that is brought under irrigation - The failure of the water user associations due to power struggles - There is no regulation nor enforcement of law by the NWRA or the TDA - Sheiks and local authorities are the rulers and Huthaiqi is a Sheikh with armed men at his disposal, which makes him stronger than the government in this case
Case 5	Wadi Seham: Person 82 vs Person 83
Parties	Person 82 and his family versus Person 83 and others

Conflict	Person 82 and his family diverted the flow of the canal to its own land by using sand bags, in coordination with the TDA, as their land could not be sufficiently irrigated due to a new road that was built parallel to the main canal. Person 83, a farmer from the lower land, did not agree with this and kept on removing the bags, also using aggression at some point.
Applicable local traditional and customary law	The rule of Al ala fal Ala
Formal law	No use of any kind formal law could be identified
(Judicial) measures taken	TDA tried to convince the farmers with technical solutions regarding irrigation and flooding, but these were rejected by downstream farmers
Outcomes	No outcome yet
Remaining (judicial) problems	- The farmers are not accepting the solutions proposed by the TDA - Person 83 is a political security officer, making any solution via governmental institutions or courts impossible for Bani Swaid (corruption)
Case 6	Ta'izz: Shararah in Arrahedah, Demna District
Parties	Villagers of Shararah area with access to a well for drinking water versus Persons 92 from a village up the stream
Conflict	Persons 92 dug a well up the stream. The villagers were afraid that this would affect the supply of their own well. Therefore they reported it to the local authorities and to the NWRA. Actions were taken, but the Persons 92 kept on digging their well.
Applicable local traditional and customary law	The traditional rule of Ala'aala be Al'ala (Highest then higher). Traditions give the rights to anyone to use water for drinking water and domestic use
Formal law	No use of any kind formal law could be identified
(Judicial) measures taken	No taken steps were mentioned, but there are traditional mediation and arbitration mechanisms in the area (through Akils and Sheiks)
Outcomes	No outcome
Remaining (judicial) problems	- Persons 92 are accused of having bribed the security when thrown in prison - Judges were on strike when the NWRA tried to bring the case to a prosecutor (institutional problems of enforcement) - There is seemingly no trust in local sheikhs
Case 7	Ta'izz: Bani Yousof Water conflict, Almawasit district
Parties	The people of the Qihaf village versus People of the Uqf village
Conflict	The people of the Qihaf village decided to pump water from down the wadi/well into their village. The people of the Uqf village living on the other side of the wadi started drilling wells close to the Qihaf well, in search of water. This happened too close to their well, and the Qihaf villages took measures, including paying for security personnel and informing the prosecutor.

Applicable local traditional and customary law	There are no rules that regulate this kind of irrigation, as drinking water and water for home consumption are for everyone, even those from outside the area. According to the Qihaf people, the Water Law regulation should be applied that there should be 500 meters between two wells.
Formal law	The NWRA issues permissions for well drilling, but it is unclear on the basis of what law. Further use of formal law mechanisms are not mentioned.
(Judicial) measures taken	The Qihaf informed the prosecution, who came and said that the Uqf had no right, but nothing happened as the prosecution suggested arbitration, which the Qihaf refused. The Qihaf also reached out the NWRA in Taiz, but nothing has happened.
Outcomes	The dispute remains unaddressed.
Remaining (judicial) problems	- The local Akels with sufficient experience to deal with conflicts have passed away. - The new ones are 'not good enough' - Local councils, prosecutions and security where ineffective in dealing with the conflict, - The laws are unclear or even nonexistence regarding private owned water use
Case 8	Ta'izz: AlHoroor
Parties	Person 94 (local sheikh, also qat farmer) versus Qassem family (allround farmers)
Conflict	The main problem is random well drilling in the area and decreasing water levels in existing wells. Qassem attempted to dig a well higher in the valley than Person 94's well. Person 94 did not agree with this, and eventually took the case to court several times. Each time the case was won by Person 94. But with the contradictory statements of the NWRA in Taizz and Sana'a and the Qassems still pushing their objectives, the conflict is not yet resolved.
Applicable local traditional and customary law	The traditional rule of Alaqrab bel Aqrab (the closer than the close). Traditional informal agreements that well owners irrigate for certain other people (forced usage); landowners are not allowed to change to another water supplier. Ala'awal be Al Awal (first then first): rule for division of irrigation
Formal law	There has been involvement of the NWRA and court decision was taken, but it is not mentioned if any kind of formal law was used in the rulings.
(Judicial) measures taken	Repeated use of the court by Person 94 and also by the Qassems but they don't trust it
Outcomes	No outcome yet
Remaining (judicial) problems	- Corruption: Person 94 is a powerful man with ties with the local government and who is able to buy off courts - Corrupt sheiks, making arbitration or mediation in the traditional way not possible for both parties - The weakness of the NWRA, as it can only try to establish informal settlements instead of solving the conflict, and it has internal conflicts and lack of communication between the different offices.

Case 9	Ta'izz: Quaradha and Al Marzuaah village
Parties	Qurada village versus Marzooh village
Conflict	The conflict is about the share of water produced by springs, with the two villages located on each side of the wadi. An assigned government committee ruled on the division of the water that was saved in special tanks, but Quradha village refused to acknowledge this ruling on several occasions. After 2011, the Quradha villagers decided to take control of the springs and divert the tankwater to their side, leaving the people of Marzooh village without tankwater.
Applicable local traditional and customary law	Traditional rights regarding ownership of the springs in the wadi, rights are claimed to be from over 400 years ago
Formal law	No use of any kind formal law could be identified
(Judicial) measures taken	Mediations by local tribal sheiks of Bani Sehaam, as both villages are part of this greater tribal community. They tried to solve the conflict through a customary law process of arbitration, but it failed as Shakik rejected the verdict.
Outcomes	There is no outcome yet, despite the intervenience of the governor of Ta'izz and some local sheiks, who tried to allocate the springs in a more equal matter. This did not solve the problem. In 2014 a committee was formed under presidential decree to investigate the problem and make recommendations for ending it. A ruling was made, stating continuation of the situation before 2011, with again a clear distribution of the water from the springs.
Remaining (judicial) problems	- There is no clear applicable law - There is no agreement on the applicable rules - Since 2011, there is a total absence of enforcement of law and government control

Annex 9: Supplementary research material Ta'izz case study

Presidential committee 2014:

In February 2014, a presidential decree was issued by President Mansour to form a committee to investigate the problem and make recommendations for ending the conflict. The following members constitute the committee:

1- Sultan Alatwani, House of Representatives Member, as chairman
2- Mohammad M. AlJunaid, House of Representatives Member, as member
3- AbdulJabar Hayl Saeed, local dignitary of Ta'izz, as member

The Presidential Committee was assisted by a technical committee from the NWRA, the Rural Water Supply, Agriculture Office, and a local coorporation of water and sanitation. It was assigned to provide the presidential committee with technical insight and was assigned the following tasks:

1- Measuring the productive of the springs related to the conflict.
2- Identifying the names and number of springs in the area of conflict including the springs that go to the collection tanks and the others that do not goes to the collection tank.
3- Suggesting solutions to increase the productive of the springs.

The technical committee visited the area with representatives from the two sides and the director of the district with the support of security committee for protection. The technical committee report was submitted to the Presidential Committee in March 2014.

Ruling of the Presidential Committee:

The ruling of the committee covered the original 5 springs which used to flow to the original main tank and their water shared by the two villages, also on other 3 springs which do not flow to the main tank and one of these springs is utilized by Merzah.(please see attached report in Arabic).

The ruling statement as follows:

1. Continuation of the water distribution as was before 2011, and if any of the two sides have an objection can appeal in the court of law.
2. The distribution of the water from five springs as follows:
    - Re Construction of main collection tank, and construction of separate tank for Quradah to accommodate their share of the water and the same for Merzah.
    - Connecting the main tank with 4 pipes of 1 inch diameter each at 10 centimetre high from the ground level of the tank to the tank of Quradah to insure flow of water all year (summer and winter)
    - Connecting the main tank with 1 pipe of 1.5-inch diameter at 10 centimetres high from the ground level of the main tank to the tank of Merzah to insure flow of water all year (summer and winter).
    - Extend pipe of 4-inch diameter from the tank of Quradah to the area of Quradah village, and extend pipe of 2-inch diameter from the tank of Merzah to the area of Merzah village.
    - Reconnection of the lower 2 springs (Alqale and Alhajeem) for the people of Merzah as it was previously.

Additional notes and information the consultant received:

1- The Government will pay the families the wergild of the killed persons from both sides.
2- A special committee from the House of Representatives was formed on 24 May 2014, and assigned to visit and investigate the case.

People met and participated in the interview:

1-	AbdulSamad Shojaa	NWRA office director, Ta'izz	
2-	Kaled shoujaa	NWRA staff, Ta'izz	Quradah citizen
3-	Nour Aden Alkobate	NWRA staff, Ta'izz	
4-	Hamoud AlHamoudi	Saber Almawadem District Director	
5-	Ahmad Naje Asabri	Rural water office, Ta'izz	Quradah citizen

Document received and attached:

1- Report of the committee of the House of Representatives to investigate the intervention of the army in the conflict. Dated June 1999.
2- The presindital committee report and recommendation. Dated May 2014.
3- Report of kaled Shouja NWRA staff, director of planning and evaluation.

This interview was conducted on Monday 26th May 2014 at the Head Offices of NWRA in Ta'izz, Chief Abdul-Samad Mohammad Yahya Al Shuja'a. At the beginning of his speech he said that the subjects that concerning Quradha and Marzooh villages are very important nowadays because of the sensitivity of the situation in those two villages. As a result of this situation, many people in the two villages have been killed and injured. The NWRA branch had interviewed and met the presidential committee. "They requested from us not to talk about anything regarding such subject." They told us that this operation is very dangerous. They also told us that this conflict traced back to the Imam's era. Subsequently, Mr. Abdul-Samad said "he would call the district manager to come and we have to sit with him". A few minutes later, the district manager came and sat with us. Eng. Khalid Al Shuja'a has also participated in the interview, which was from the same conflicted area.

The Eng. Khalid said that "The problem has its background in historical disputes, which could be traced back to Imam's age and many judgments had been issued regarding it. Furthermore, in the reign of the former President Ali Abdullah Saleh there were many judgments that had been issued regarding the same matter. Quradha was providing water to Marzooh. However, due to the shortage of water they were unable to continue to provide them the same quantity of water, as had been the case since 1998. The problem has been a continuous one up until the present day. The victims of both sides were 17 persons who had been killed and 80 injured, including some soldiers from the armed forces. Though the information about that conflict is very secret. There was a report has been published on Facebook concerning Quradha and Marzooh. Nowadays more information about that conflict had been spread and the case has become huge and enlarged and everyone claimed that he has the right."

In the reign of former President Ali Abdullah Saleh, the case has arisen and the former Governor has solved it. Yesterday (25.5.2014) this case was discussed in Parliament. The Eng. Khalid Al Shuja'a, who is working in the NWRA – as a manager of the planning administration, said, "the problem began in 1997. There was an objection from the Marzooh villagers", as he says, after the project implementation in Quradha, the Marzooh villagers had destroyed the pipes and the reservoir "which collects water" and then the war broke out between them in 1998.

That war was the cause of many deaths and injuries on both sides. Furthermore, some soldiers were also killed during the war. In 1998, the ex-president Ali Abdullah Saleh had given his orders to the judge "Aqabat" and Dr. Rashad Al Aliemi to solve the problem. "Their solution was that 2/3 of the water quantity was a portion of Quradha village, and 1/3 of the quantity of water was the portion of Marzooh village: a pipe of 4 inches for

Quradha and a pipe of 2 inches for Marzooh from the collective reservoir." The implementation of such judgments continued until 2011.

In 2011, the pipes and the collective reservoir were attacked, as the engineer said, who was from Quradha village because the judgments of the committee were not fair, and they had not participated in the judgments. The villagers of Quradha said that they have judgments confirming that they have had their own rights of water for more than 400 years. In 2011, the conflict continued and each side organised themselves, and are prepared for a possible war.

In 2014, the President formed a committee and the parliament established another committee headed by MP Sultan Al-Atwany, together with Mohmoud Al-Gunied and Abdul-Jabbar Hael. The final decision of that committee was that the situation must be returned to the pre-2011 situation. The report of the sub-technical committee has also confirmed the water uses and rights.

- Engineer Nooral-Din Mohammad Al-Gobati who is one of the engineers at the NWRA stated, "The problem is very old and there were relevant judgements were issued since the Imam's regime and the last judgements were issued in 1998, provided that 2/3 of the quantity of water for Quradha and 1/3 for Marzooh. The water comes from the five springs to the reservoir. In that reservoir, there are two pipes: the first pipe of 4 inches for Quradha while the second pipe of 2 inches for Marzooh.

The aggression against the reservoir and the pipes was ensured that the Quradha villagers shifted all the water of the five springs. As a result, they immediately took arrangements and are on alert for a possible war.

- In 1998, all the sheikhs of Saber and the Government intervened to resolve the conflict. However, they could not do anything to solve the issues.
- In 2014, right now the presidential committee is intervening.
- The role of the (NWRA): It intervened with a team of engineers as a member in the technical committee which included: Rural Water and the Local Institution for Rural water and the Bureau of Agriculture. The technical committee submitted its report to the presidential committee.

Regarding the required affairs that they wanted, their role was as a technical consultant. The required interpretations of the committee were to measure the productivity of the five springs, to define the existing springs in the area regardless of whether they flow into the reservoir, and to increase the productivity of such springs. Subsequently, the technical subcommittee presented its report to the Presidential Committee after their visit to the location accompanied by representatives of the two parties together with the representative of security committee.

After all of these procedures the report was submitted at the end of March of that year.

- Eng. Ahmed Naji Al-Sabri, one of the engineers of Rural Water Authority, who was one of the Quradha villagers, said that the root of the problem needed to be returned to all locals in the two villages, because they are all brothers and they were from the same families. All of them had lived before 1997 in peace and harmony; everybody drinks from his special resources of water according to the customs which they respect since hundreds of years. In 1997, Quradha village was awarded a project to maintain the pipes and the reservoir from the General Authority of Rural Waters in Ta'izz, the other party did not protest. However, in 1997 Marzooh villagers protested against that project.
- The governor intervened to solve the problem and he took the pipes to connect them with the springs but he faced many problems so that the problem remained; the pipes were broken and destroyed, and the reservoir was still as it was.

- In 2001, the Sheikhs of both parties were called to the republican palace and each side brought the judgments that confirm its right of water.
- The judge Aqabat visited the area after the former president ordered him to resolve the problem. He witnessed the destroyed springs, consequently, he has made his judgment. Bearing in mind the water flows to and from such springs, he ruled that a pipes should be laid, namely a 4 inch pipe for Quradha and a 2 inch pipe for Marzooh. Both parties signed and agreed upon that decision.
- Five years later, the quantity of water decreased and the problem resurfaced.
- During that period, both the district manager of Saber Mr. Abdul- Bari Mohammad Al Hammadi had visited the conflicted area. However, he started justifying his stance that he has been assumed the office lately in 2013 and he knows nothing about the matter.

So he has no more information concerning the problem, but he said that the problem of Quradha and Marzooh had its historical and social background in the mountain of "Al-Oyoon" in the district of "Maradem" where there was a dispute between the two villages for the last thousand years. Quradha villagers claim that they own the rights to the water in the springs, because they have judgments since the age of Imam Al-Hadi. The problem had resurfaced, was renewed in 1997 and continued in 2011. The dispute ultimately led to the deaths of a number of citizens, and several others were injured. The former President Ali Abdullah Saleh issued orders to resolve the problem. He said "the committee which looked into the case in 2001 had said in its judgements that the water must be divided like the following:
The pipe of 4 inches is for Quradha; and
The pipe of 2 inches is for Marzooh village;
That means the reservoir includes 2 pipes, one of them is 4 inches for Quradha, whereas the other pipe is of 2 inches for Marzooh."

However, the villagers of Quradha protested against the judgments and said that the judgment had been forcibly imposed on them. They also said that the judgments were unfair because they only dealt with the four existing springs, which are all of them. They said, "Marzooh had its own springs and that was the upper stream or the sixth stream. They said also "that they did not receive the judgements". "When I received my work, and under the instructions of the governor we were ordered to fill the complaint regarding those who constructed the pipes and the reservoir so as to get their penalties. But Quradha had appealed that adjudication." The presidential committee had come too late and it made a report and replied about many questions.

Six engineers from many ministeries and institutions have measured all the quantities of water in all the springs and they met both sides of the conflict and heard from their Sheikhs and then they issued their final decision. That committee was neutral and all the parties couldn't affect on it.
But the solution must come as a result of compromise between the two parties.

- Quradha villagers protested against the decision of the presidential committee and demonstrated against it.

Currently, the situation is quite, and has been created by virtue of the efforts of the military leadership in the district.

- There are some documents with this report;

1) An agreement to solve the problem between Quradha and Marzooh villages in Saber Al Maradem district in Ta'izz governorate.
2) A report from the committee of the parliament about what happened in Ta'izz.
3) A report made by the Eng. Ahmed Naji Al-Sabri.

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