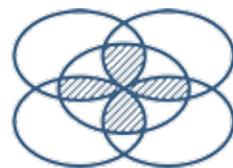


Codifying Water Rules and Rights (in Spate Irrigation)

26



Practical Note Spate Irrigation



Spate Irrigation
Network Foundation

1. Introduction: why pay attention to water rules and water rights

This Practical Note discusses the codification of water rules and water rights in flood based farming systems. It is based on discussion and research in Nimroz Province in Afghanistan and serves as Guidance Note for the codification of water rights in the country. It draws on experience from other countries with similar challenges – how to manage the water rights in flood-based farming systems.

There are several reasons to reviewing existing arrangements for distributing water and to better define water rights and consider to register and codify such rules and rights. This applies to flood based farming systems but in other water systems as well. Systematically reviewing water distribution systems can serve **four powerful objectives**:

1. Optimize the use of water – it is not uncommon that water distribution system have never been updated, even though many changes occurred in the water resources systems, such as the larger use of groundwater and the development of new infrastructure. In some cases water rights and water distribution rules were never systematically considered or even recorded even in the first place. The result is a water resources system flying blind.
2. Mitigate risk of conflicts and ‘voids’. Access to water may be contested in the absence of clearly defined rules – with the risk of water conflicts. There is also the phenomena of voids – when resource systems are unregulated and unmanaged, the chance of the resource degrading without ‘anybody blinking an eyelid’ is large. This has happened with the erosion of rivers systems or the uncontrolled overuse of groundwater – resulting from such voids.



Figure 1: Al Mujelis at tail of Wadi Zabid system.

3. Define access to resources and protect weaker parties. Clear water rights may benefit those who stand to lose most from powerplay around the use of natural resources – generally the smaller and less politically connected users. Rights and water rules may also be framed to specially benefit those whose land is downstream or located at higher elevation.
4. Discuss further management responsibilities that come with water rights, Water rights are often dependent on contribution to operation and maintenance or can be suspended in case of gross violation. Hence formulating water rights and rules goes beyond access to water and cover the management of the water system as well.

There are a number of examples of spate irrigation systems that underline the importance of having water rules discussed and recorded, see table 1.

In spite of these there is little attention for water rights and distribution rules. For all the interest in water governance, the topic of water rights and water distribution rules has been largely ignored – regrettably because one can argue that it is at the very core of water governance. The neglect of water rights and water distribution rules is not limited to flood based farming systems, but



Figure 2: Pollution of water by oil exploitation in Ecuadorian Amazon: no rights, no justice.

Table 1: Examples of spate irrigation systems that underline importance of discussed and recorded water rules.

Pakistan, Daraban Zam	In DG Khan in the Daraban Zam system after the devastating floods of 2010 was rebuilt with several innovative features (such as permeable spillways and new guide bunds). Alongside this the 98 year old water distribution system was rediscussed, rationalized and updated to the present situation. New flow division points were introduced and the system of water distribution was overhauled. It caused an increase in command area of 20 percent.
Sudan, Gash	In the Gash system six designated blocks are entitled to spate water. If there is excess water it goes to the huge inland delta, i.e. the Gash Die, which feeds a considerable animal population. In the past the land in the irrigation blocks were assigned by lottery and there was no interest among land users to develop a proper system of field water management. As a result inefficiency was very high – with water logging in the headreaches and water shortage in the tails of the mesqa blocks. The land titling provided the opportunity to change this. At the same time the water distribution between the upstream blocks and the downstream delta may be reconsidered.
Pakistan, Nara	Major investments have been made in water barrage on the Nari River, probably the most important spate river in Pakistan in terms of area served (approximately 90,000 ha). The system in the past saw multiple off take points each supplied by an earthen bund that would be broken if the upstream area was reasonably served. The new barrage has changed the water availability, supposedly the ability to control and divert higher floods. It has also changed a sequential system of water rights in a flow distribution from a single point. The new water distribution implicit in the barrage infrastructure has however not been translated in new water use rules and water right at the highest and lowest level in the system.
Yemen, Wadi Zabid	A water distribution arrangement has been in place – recorded 600 years ago – in Wadi Zabid, allowing different section of the river system to make use of the water in pre-defined sections of the year. The coastal downstream area was excluded from this water distribution but it used to get runaway floods that would escape from the upper areas when soil bunds were failing there. The construction of permanent concrete diversion structures in the upstream area effectively ended these runaway floods. The permanent structures upstream also blocked the subsurface flows in the river bed. Both phenomena caused groundwater resources in the coastal areas to dry up and top soils to get dry. With prevailing heavy winds for five months in the coastal zone a process of sand dune formation set in with several coastal villages losing more than half its population (see figure 1).



Figure 3: No rules on groundwater: uncontrolled use of fossile groundwater for export horticulture - rapid depletion (Wadi Natrun, Egypt).



Figure 4: Mega-irrigation: Water rights outdated, water distribution unclear and suboptimal (Gezira System, Sudan).

stretches across the board in water management. There is for instance almost zero attention to regulate groundwater use, even though it concerns 41 percent of all water used in agriculture and an equivalent proportion of public water supplies. Similarly in main mega-irrigation systems, that serve 500,000 hectares or more water rights are typically either non-existent or outdated – not having been adjusted after major investments in water control systems for instance. Typically water distribution rules are out of sync with such new developments such as the increased use of groundwater in the command areas. Even worse rules and individual or collective water entitlement are often unknown to system operators or water users. Similarly the rules and rights with regards the water quality of main water bodies are non-existent. It is fair to say that in the absence of such explicit rules there is often no basis for water justice.

2. Nature of water rights

Water rights are often linked to land rights with the former attached to the latter. Yet at the same time water rights differ from land rights in a number of ways. Below some of the main differences are given:

Water rights are **not 'property' rights**, unlike land they can in many cases not be easily transferred from one individual to another. In many cases the obligations and privileges that come with land ownership are transferred.

Water rights operate at different interlinked levels. There are water rights at higher levels (between countries, between regions), intermediate levels (between canals and command areas) and lower levels (between different water users).

Water rights – unlike land rights - often deal with unknown resource quantities: high flows and low flows; flows in different seasons.

Water rights have many facets: they affect not just the availability of the water in rivers or lakes, but come in the shape of subsurface flows in river and shallow and deep groundwater and soil moisture as well. Water rights and distribution rules immediately affect other factors such as subsurface flows in river beds or the microclimate.

Water rights often come with clearly defined responsibilities – such as the contribution to operation and maintenance of the water system or the obligation not to violate its integrity. Water rights hence often have the nature of **'collective user rules'**. For an example see the water management rules in Rod e Kanwah (Kot Qaisrani, DG Khan, Pakistan).

In spate irrigation the water rules and rights are qualitatively different from other surface water systems, because the quantity nature and timing of the spate flood often varies, making the system less predictable. As a result water rules are more 'reactive': anticipating a large number of water situations (see also the example of Rod e Kanwah), different floods and but also changes to the river bed and the level of the land or severe sedimentation. Within the overall uncertainty that is inherent in flood based farming systems, water rights create predictability and equity, and as such for instance encourage land preparation and facilitate cooperation in maintenance. These water distribution rules are often not formally recorded. They are also often 'incomplete': they do not address all important aspects, such as for instance the impact on recharge and subsurface flows. Water distribution rules in spate irrigation system typically concern a mixture of different arrangements, see table 2.

3. The case for registering of water rights in Afghanistan

In Afghanistan disputes over land are a primary driver of conflict (Gaston & Dang, 2015). Several studies showed that between 50 and 70 percent of disputes in Afghanistan are related to land and property (Dennys & Zaman, 2009; El Saman, 2008). The frequency and extend of these disputes has been increasing rapidly ever since the competition for land increased. This can be explained by several factors e.g. rapid urbanization, rising land value, population pressure, displacement and resettlement. Poverty and scarcity of productive land has created

strong competition over land among different tribes, communities and ethnicities.

Research by UNEP (2013) highlights that clashes over water allocation is the second-most frequently mentioned cause of conflict after land. Also, inequitable allocation of water is prevalent contributing to a substantial tension and latent violence within Afghanistan (UNEP, 2013). Conflicts arise when earlier water sharing agreements are not adhered (AREU, 2013).

Since 2002, population movements and demographic shifts have changed customary ownership and settlement patterns which intensified competition rapidly. Another important driver for conflicts is the increase of property values, This gave rise to predatory behaviour among armed groups and state actors (Gaston & Dang, 2015). It has often resulted in land grabbing which has developed into a well-known practice in Afghanistan (Batson, 2008; Irvine, 2007; Rashid et al., 2010; Sherin, 2009).

Table 2: Water management rules in Rod e Kanwah (Kot Qaisrani, DG Khan, Pakistan)

Water distribution	Command area protection
Water distribution starts from the head and goes to the tail.	Even if field(s) remain barren for long periods the right to irrigation remains valid.
When after a first irrigation the upstream fields are watered, but the downstream fields are not irrigated sufficiently, then the upstream field can still take precedence in using the second flow.	The location of a diversion structure, channel intake or division structure can be changed with mutual consent of land owners.
There is no limit on depth of irrigation of an upstream field.	If after filling his own field a land owner delays breaching his diversion structure and a nearby field is destroyed, then the losses will be met from the person who did not breach the diversion structure in time.
No body can sell or donate his share of water. In land transactions water is transferred as well.	No person has a right to construct new branch/flood canal that deviates from the prevailing situation. However, when the channel has changed naturally, then a new flood canal can be constructed, provided the earlier flood canal is completely damaged.
A field cannot be supplied by more than one diversion structure.	When a person intentionally destroys the water then according to common loss is recovered both for the loss of water and the destruction of the field.
If a bund in a flood channel irrigates two fields, water will first be applied to the higher land.	On reappearance of eroded land, (through siltation) the rights are vested with the original owner.
When a diversion structure has been washed away during irrigation, it is allowed to construct a new diversion even if water is already reaching other fields.	
Maintenance	Others
Common maintenance work is performed on the basis of area of land.	Ownership of the flood channel – including trees inside, is based on ownership of the adjacent fields.
To maintain the flood embankments close to a main bund is the responsibility of all users of the ghanda (diversion bund).	A diversion structure can be constructed on one's own land as well as others land, wherever it is most suitable.
Strengthening the banks of flood canals is the responsibility of the owner of the land facing the bank.	No body can expand his land by encroaching the river bed.
Landowners whose fields are irrigated through overflow (chal) and not through bunds and embankments do not take part in the common maintenance work.	When one shareholder does not contribute in the common labour during the specific period, he will not get right of water in the current year. In case he wants to contribute in future then first he will have to compensate the previous year costs of common labour and also by a fine of eight days labour.

Box 1: Elements of water distribution rules in spate irrigation systems

- Demarcation of land entitled to irrigation
- Location of diversion structures and overflow structures
- Rules on breaking of diversion bunds (timing, persons initiating)
- Permitted diversion canals
- Proportion of flow going to different flood channels and fields
- Sequence in which fields along a channel are watered
- Depth of irrigation that each field is to receive
- Penalties on actions that may damage neighbouring fields (such as excavating soils for field bunds or uncontrolled breaching of field bunds)
- Rules on second and third water turns
- Special preference rules (for vital crops for instance)
- Agreed variation in rules when dealing with small or big floods
- Maintenance obligation that come with access to water

Historically, the Afghan State did not play a significant role in land and water management. The State tried to formalize land ownership in the 1960s and 1970s. However, the effort was limited and the focus was primarily urban. The State was too weak to enforce property rights beyond urban centers so legal title was of little value to most people. On top of that, most documentation

on land rights (maps, principle books, surveys and title deeds) held with the local courts or the property owners, had been lost or destroyed. Some maps and municipal records were even altered to enable misappropriation and land grabbing or were deliberately destroyed. Formal records that used to exist had become unreliable; many of them were forged in order to make illicit



Figure 5: Wadi Mawr Yemen: Weir blocking subsurface flows, benefitting upstream wells and land. Infrastructure development often undermine existing (informal) water rights and water distribution. It also often overlooks different elements of water control (f.i. subsurface flows) - creates voids and typically does not include work on modifying water rights and water distribution.

Box 2: The impact of poppy cultivation

Sound management of land tenure is inseparably connected to other sectors. As a case in point, according to Deschamps & Roe (2009), *'as poppy production and the opium economy continue to flourish—notwithstanding commendable progress in certain areas—many farmers find themselves with insufficient land, or insufficient water for their land, to sustain their families with legal agricultural activities. It is well understood that if they do choose to grow opium poppies, this may have the knock-on effect of funding the insurgency and perpetuating conflict'* (p. xi).

land grabs possible and rather than a way to solve conflicts became a source of conflicts. Now less than 20 percent of the land in Afghanistan is accurately titled. Most land ownership and use is based on historically constructed informal or customary arrangements (Gaston & Dang, 2015).

There is a rising demand for water and land dispute resolution in Afghanistan; the percentage of stakeholders that search for outside support increased from 28 percent (2007) to over 50 percent in seven years (Warren, 2014). Dispute resolution in Afghanistan is historically community-based and land disputes were mediated successfully in this way. However, after the 1979 coup, two decades of instability and conflict followed which weakened the social structures of the communities. Since 2002, the traditional community-based mechanisms have further destabilized because of ongoing displacement and insurgency and socio-economic changes (Gaston & Dang, 2015). Nowadays, these community-based mechanisms are often not permitted and/or unable to provide documentation that is accepted by the government (Deschamps & Roe, 2009).

On the other hand the State itself has proven to be unsuccessful in sustainably settling disputes which can be mainly explained by their poor enforcement capability, limited presence, lack of widespread authentic title deeds and bad reputation due to land grabbing and corruption practices. In summary, at the moment there are

no strong mechanisms available (both state mechanisms/formal and community-based mechanisms/informal) to prevent or regulate land and water conflict. Because of these weak mechanisms, disputes fester and multiply quickly; they increased significantly in recent years and became more difficult to resolve (Gaston & Dang, 2015).

Land grabbing by powerful elites like state agents, military commanders and parliament members has worsened the situation (Irvine, 2007; Sherin, 2009; Synovits, 2003). The total area affected by usurpation is estimated at 240,000 hectares in Afghanistan. The prevalence of forged documents is an obstacle for land reform and makes it difficult to effectively plan rural development (Deschamps & Roe, 2009; Gaston & Dang, 2015). There are different forms of land conflicts. Apart from the illegal occupation of land by powerful people, there are issues on inheritance rights to private property; return of people to land they previously owned; disputes on private property within villages and conflicts on common property resources managed through common property regimes (e.g. forests, water for irrigation and pastures). Hence apart from the land grabbing there are disputes on lands of typically less than 0.2 ha.



Figure 6: Illegal gate built on Lashkari Canal's escape way.



Figure 7: Powergames: sons of large landlords who benefit from infrastructure development and are also able to build canals forcefully (Wadi Zabid, Yemen).

Box 3: Water rights and water permits in the Water Law 2009, Afghanistan

Article Twenty:

“(1) Existing water rights will be gradually converted to permits in accordance with the policies of the relevant River Basin Agency.

(2) Water User Associations obtain water use permits after proper registration and in accordance with the provisions of this law.”

Article Twenty One

“(1) An Activity Permit and Usage License, including for government projects, will be issued at the request of the applicants and in accordance with the provisions of this law.

(2) Application submission to obtain an Activity Permits or a Usage License is mandatory under the following circumstances:

- Surface and groundwater use for newly established development projects.
- Disposal of wastewater into water resources.
- Disposal of drainage water into water resources.
- Use of water for commercial and industrial purposes.
- Use of natural springs with mineral contents or hot springs for commercial purposes.
- Digging and installation of shallow and deep wells for the commercial, agricultural, industrial and urban water supply purposes.
- Construction of dams and any other structures for water impoundment, when the storage capacity exceeds 10,000 cubic meters.
- Construction of structures that encroach the banks, beds, courses or protected rights-of-way of streams, wetlands, karezes, and springs.

(3) The sale and purchase of an Activity Permit and a Usage License in terms of this law is prohibited.

(4) The procedure to issue Activity Permits and Usage Licenses will be prepared and approved by the Ministry of Energy and Water with the cooperation of other relevant institutions and line Ministries.”

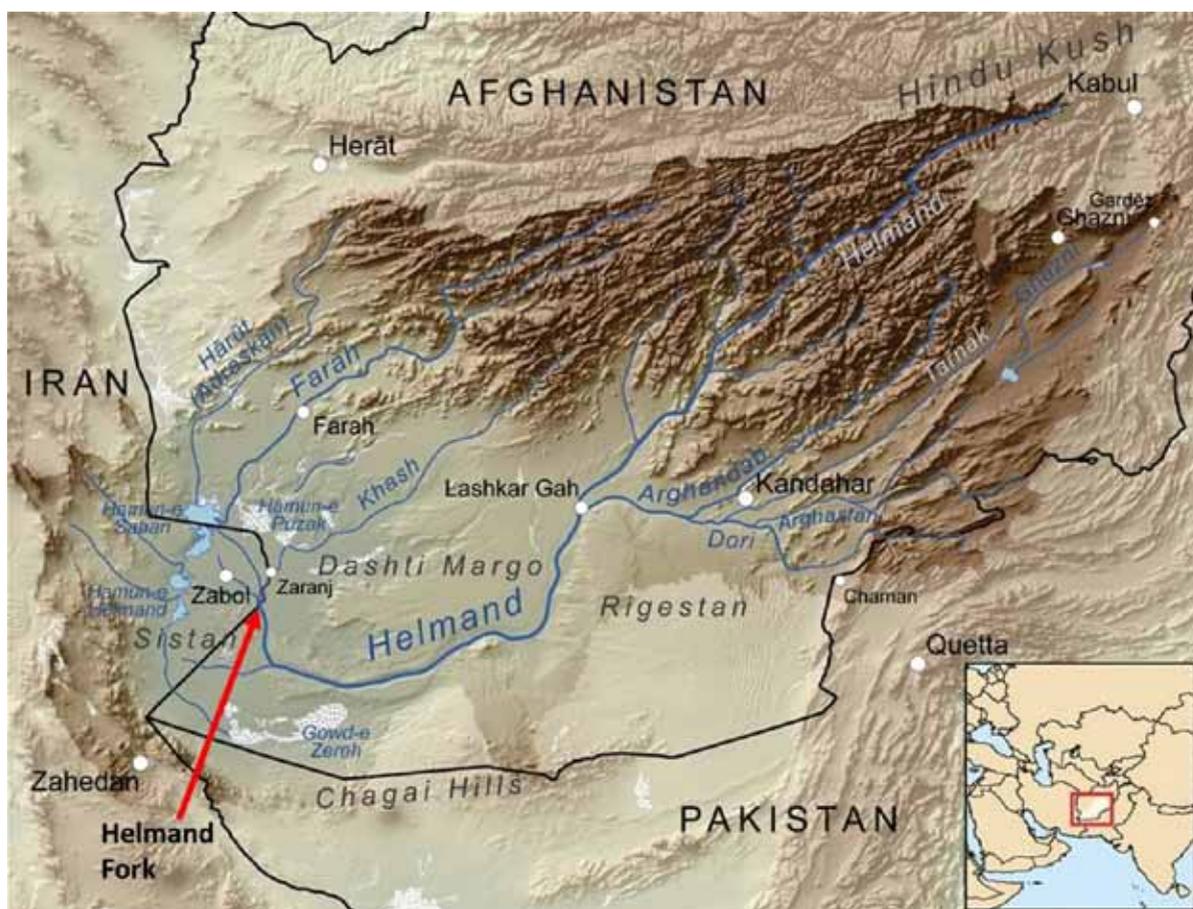


Figure 8: Map of Nimroz province.

Box 4: Thirty years of conflict in Afghanistan – what did it do to water rights?

Practical

- Much water Infrastructure became dysfunctional – now being rehabilitated and rebuilt
- Powerful individuals have used opportunity to make new canals, widen intakes and tamper with water distribution in various ways
- Documents and records destroyed
- Water rights in some cases converted in Taliban Area

Change in society

- Changed population dynamics – agriculture as important economic sector
- Continued importance of poppy cultivation in several areas
- New type of representative politics and upsurge of opportunistic behaviour- replacing earlier locally rooted leadership
- Faith in community organizations weaned away
- More expectations from State (paradoxically) with State expected to resolve conflicts and to do most investments in water infrastructure

Apart from mitigating conflicts, there are a number of other compelling reasons to improve and settle water distribution rules and rights. Overall, the agricultural sector in Afghanistan uses 95 percent of all of the water available in the country (UNEP, 2013). Improving water distribution systems will also help the efficient application of water and the productivity of the agricultural sector. A large number of infrastructure projects being developed: settling the water distribution rules and the water rights is clearly linked to their best usage and to fairness in access. Habib (2014) points out that conflict and lack of adequate water management systems are often linked.

The current system of registering land rights in Afghanistan is best described as hybrid. During the Abdur Rahman reign, the government

registered landholdings by granting rights in proportion to their area for the Pashtun settlers (AREU, 2013). Also land titles are often derived from past tax payments.

Courts maintain their own registry of properties, therefore, to obtain absolute ownership of property one must use the court-based system (LANDac, 2016). Officials will record the property's value in the tax book and registration book (ALEP, 2015). 'The basic unit for registering land is the deed. A **deed** is a formal legal document that certifies a person's ownership of a piece of land. A deed can take the form of court-registered proof of land ownership or transfer, state or government decrees of purchase from the government, tax payment documents, water rights documents, registered customary deeds, and formal title deeds issues after legal settlement' (ALEP, 2015, p. 152). However as mentioned the records are generally incomplete and in some cases manipulated.



Figure 9: Distribution of water in Kang District. Unlike Zaranj, people do not have control gates for controlling amount of water, and they use such structures from clay or concret slabs for closing intakes.



Figure 10: Old water distribution structure in Lashkari Canal is now being replaced.

Water rights have different origins, but a common one relates to the original development of the water resource – which in the conditions of Afghanistan – often required considerable skill and effort. The allocation process itself has roots in acquisition of water resource itself with those investing land, labour or money being rewarded with an entitlement to the water resources. In case of modern irrigation schemes and new projects mainly initiated by public sector and donor's support, the situation is different. Government organization may use various methods – depending on the prior history of the area (earlier land and water rights) or farmers or investors contribution, on Water 2009). Generally, it is not easy to formulate rules and fix rights in existing scheme as consensus of all land owners is required to amend or propose new water distribution rules. For greenfield systems it is easier. In Afghanistan there is no systematic record of water rights and rules. Some arrangement maybe captured in documents, whereas others are not.

The Water Law of 2009 introduces a number of arrangement on 'water permits' (see box 3) and makes their acquisition dependent on new organizations: Water Users Association and River Basin Agencies – which is a break with the past. Though the conversion of existing water rights is mentioned, the emphasis is on new water resources development. It should be mentioned that seven years after issuing little has happened in terms of new water rights and permits.

4. Water distribution and water conflicts on Lashkary Canal in Nimroz

Nimroz is one of the poorest and driest districts in Afghanistan. Located in the far Southwest of the country its distinguishing feature is the Helmand river, which originates from Sia Koh and Parwan Mountains range, passes through north of Kabul and then finally drains in Sistan Wetlands of Iran. Its average flow is 140 m³/s: yet its flow changes from year to year and also from one month to another. According to the 1973 Helmand River Treaty, from this amount of water 22m³/s is the right of Iran plus 4m³/s due to brotherly relations between Afghanistan and Iran. The remaining water is used in Afghanistan. As there is no storage facility on the Helmand River in Afghanistan much water during the flood season (December – March) is left unutilized, whereas

in the dry season even drinking water needs are not met – also because groundwater in Nimroz is generally saline.

From the Helmand river 35,000 hectare is irrigated in Nimroz Province. The major canal is the Lashkary Canal, which diverts water to the cultivated areas in Zaranj district and Kang district through a network of branch canal and minor canals. The total area served is 18,000 ha. There is no clear and detailed rule regarding the water distribution in the Lashkary Canal or on the way conflicts are resolved. Different sizes of canals and amounts of water are used. The broad general pattern is for farmers to share the amount of water among each other according to their land area – a rule called 'nitra' and then to come to a more detailed agreement in *juis*. There is not any specific rule regarding time allocated, filling of area, and depth of land; furthermore, land users simply open their gates as they wish and close these as well.

Even the broad *nitra* principle is increasingly violated. Partly this is related to the overall decay of the water infrastructure giving room for opportunistic behaviour. Powerful individuals in particular especially in Zaranj District have made illegal canals to get more water than they are supposed to and developed land upstream. This is against a background where many of the records and recollections of land and water rights were lost. Three decades of conflict in Afghanistan have affected water distribution in a number of ways (see box 4). The sequence of watering is conventional: from upstream to downstream. This creates problem for downstream water users due to high consumption upstream and the expansion of farmland upstream. Moreover, lands at a higher elevation often do not get served as the flow in the canals is too low during water shortage.

For distribution of water in the Lashkary canal, there are the water masters (*mirabs*) who, in coordination with branch of Ministry of Energy and Water, are the key actors for sharing and distributing water. This is their prime role: to look after the system of water distribution. *Mirabs* are selected by council of land owners and local branch of Ministry of Energy and Water. The selection is based on merits such as having recognition and reputation among the people, knowledge and judgement, and work experience.

There are six *mirabs* in charge of organizing and managing water sharing in Zaranj and Kang

1. Examples of codified water rights from spate areas in Pakistan are placed at <http://spate-irrigation.org/special-projects/water-rights-pakistan/>

districts of Nimroz province. Two of them are employed officially and the others are unpaid. The *mirabs* and Conflict Resolution Manager from the branch of Ministry of Energy and Water are also the first resort in local conflict resolution. The general patterns is for *mirabs* to receive the issues and after hearing resolve them according to their judgement. The meeting place for solving the conflicts is on the site of conflict. Landowners may accept the *mirabs* judgement, but they are not bound by them. In some cases, land owners refuse the judgement suggesting that the water master are influenced by affinity for one of the conflict parties or by local politics.

When conflicts are unresolved, they are referred to the Provincial Administration. There are several processes to mitigate conflicts at this level. The first option is more elaborate discussion by the *mirabs* and the engagement of government staff – starting with the Conflict Manager. Another mechanism is to present the conflicts to a *shura* (People's Gathering). In that case the final decision is made by unanimous vote of people. In other parts of Afghanistan local power brokers – members of Parliament, trusted local politicians and leaders – may also be invited to mediate. The process differs from case to case but in some cases it is agreed prior to the mediation that the judgement of the mediator will be binding. If the decision of the *shura* is not followed, the party that rejects the decision is responsible for the outcome of further conflicts.

In summary the water masters look after the agreed water distribution system and resolve current relatively simple problems. When conflict become more complex or charged they are referred to a higher level, where different more hybrid mechanisms can be used. In case also that water distribution arrangements have to be set in place, the responsibility is beyond the water masters but a mix of local authority is engaged.

The Ministry of Energy and Water has currently increased the investment in irrigation infrastructure, including the rehabilitation of water distribution structures. This opens a window of opportunity to discuss and firm up water rights and remove the lack of clarity. In the past water was distributed by circular canals made from concrete. These structures deteriorated by the passing of time. At present they are being replaced by new distribution structures of steel gates.

In the past, there was no significant conflict over water sharing among water users and water was shared in accordance with need of land users. However since seven years, with the larger stability, the cultivated area has

increased, leading to a shortage of water and the occurrence of opportunistic behaviour, such as the development of new canals. The competition over water is exacerbated by the sedimentation of large sections of the canal – reducing the water available.

In Kang district, problems in sharing water seems to be significantly less than Zaranj district. In Kang district the distribution of water is for instance well arranged, managed by the senior water masters (*mirab*) of that district. In this district, water is distributed proportional to land area, and for this purpose, time shares called *mai* is applied which equal to six hours. In this area, water is distributed by tossing a coin to determine the turn of water. People in Kang district must accept every decision made by *mirabs* and *shura*. If not, they may receive a penalty, like being deprived from water. There is no fixed control gate to regulate water on most of the water distribution structures and intakes are closed with soil and mud. The very minor issues around this are resolved locally. With the increased demand for water, permanent control gates are being installed allowing water to be managed more precisely.

5. Codification of water rights in Pakistan

Whereas in Afghanistan the water rights and land rights are not systematically recorded, in neighbouring Pakistan many areas have a long history of codified water rights¹. Here the typical example of two adjoining districts of Pakistan (Dera Ismail Khan and Dera Ghazi Khan) are discussed: they resemble the Afghanistan's situation, but also serve as a good practice for other water distribution systems.

Water rights of minor water resources like *karez*, Persian wheel (hand dug well), spring and spate rivers are made part of land record as an annexes. These have been registered during the first land settlement of 1872 by the by that time



Figure 11: Example of codification experience from Pakistan.

British Colonial Administration. The idea was that by better regulating the water resources in the area the crop production in the area would be assured, creating a dependable revenue basis.

While preparing the land and water records, special officers were deployed to register the existing rules. This formed the basis for the codified rights. These were formulated by actively involving stakeholders keeping in view the entire local rules and possible improvement to them. The rules as discussed were loudly narrated in meetings of land and water users, village elders, tribal and religious leaders. The document was then prepared and again recited in general assembly of all local stakeholders (in this case land/water owners and sharing parties/groups) and their signatures/thumb impression were taken along with government officials signatures and with its official stamping.

Content of the records

The records were written down on durable cloth or parafine paper – making it easy to keep and to inspect. In the record each ephemeral river/stream has the distribution rules of the spate flows written down. Distribution rules include division among villages, tribes, upstream and downstream and to groups of land plots and individual fields. Distribution also covers division and use of season's flows among owners/users. The document, which is part of land record, also include the spate river's name, its origin with location, tributaries, boundaries of watershed, routes from start, command area, drainage to the end. The most common season of spate occurrence is mentioned besides any abnormal flows. It is worth mentioning that former district Dera Ghanzi Khan has 194 spate rivers in total and been categorized as large, medium and small ephemeral rivers. All 194 spate sources are individually recoded with full detail in the land record.

The documents also includes sketches and maps of water source(s), tributaries, location, passages, name of valleys/villages situated along the passage, any mile stone or significant reference point such as mosque, graveyard, hill top etc. along with description. The length of river/stream/karez is mentioned describing the distance to and between each diversion structure. The width at different location is also mentioned and past changes in the bed are documented too. Depth of river/stream at various sites, possible erosion danger and or overflow from banks at various locations, slopes towards down streams and left and right direction is also described.

The name of canal, distributary branches, sub

canals and water courses (where applicable) with names and their locations are described comprehensively with any change in routes over a time period.

The sites to construct earthen structures for diversion of spate flow are well defined and demarcated physically as well as on cadastral record maps.

The area/fields to be irrigated through each diversion structure is defined with the sequence in which they are irrigated. These areas are predefined and cannot be increased even when the spate volume is higher. Here timings of irrigation rule may mentioned particularly, if and when applicable. The document includes total area to be irrigated with spate rights. In case of surplus water or uncontrolled water (due to breaches in canals or structures) water is drained to adjacent areas but those area have no formal rights.

An annex is prepared for construction, operation, repair and maintenance of spate irrigation structures. This is in the form of certain questions and probability of issues occurrence on special occasions or circumstances and answers are recorded (see box 2). This annex is in addition to series of general rules and laws pertaining to water rights and use. The contributions to operation, repair and maintenance are based on land ownership and are mutually agreed by owners. In certain cases, hereditary tenants also contribute in construction activities according to agreements with land owners.

Different positions and roles are also defined in cadastral record along with land ownership rights and water rights such as water master, water guards etc. Their roles, responsibilities and administrative powers in managing spate water rights and practices are well defined. Reward and punishment rules are also defined in case of proper functionality and violation accordingly.

Major and minor crops grown in area are also recorded besides fodder crops.

The family tree of shareholders for water are documented with name, father name, tribe/clan, address. The share inheritance is also described from paternal, maternal side, purchased, gifted, and given through a special agreement such as transitional period.

Enforcement

Land department's staff is responsible to measure and report the spate flow data to higher offices on regular basis. For this simple methods of water discharge measuring are applied. For

this purpose, local trained staff is employed. In Pakistani context, the lowest cadre staff of land revenue department writes daily diary of his activities including any rainfall and spate flow occurrence.

Copies of these documented rules are part of land record and kept at three sites – at local level with government functionary called Patwari, sub district level and district level with government administration besides a copy is also maintained at provincial level with archive department.

The civil courts cases related to land and water issues are dealt by courts and the above documented is the key source for decision making. Courts also use this record in case criminal cases are involving land and water issues. This record (land and water) is also used in dealing land acquisition, compensation and resettlements issues by the government.

Copies of these documents (land and water share record) can be obtained by all including non-owners from the relevant land authority(s) (department/ministry/authority/municipality) against a nominal fee.

More than a century of being recorded the codified water rights are still used on a daily basis. A special revenue officers is supervising them, and land and water users frequently consult the rights. In the past the staff working in supervision on the water rights had magistral power and could issue warrants on defaulting water users. This power has been removed and placed in the regular court, which has reduced the direct authority of those supervising the system. Even so the management of the spate irrigation system is orderly and incidents of big landlords developing unauthorized off-takes do not occur.

The main drawback of the codified water rights in Pakistan is that they are not updated, even

if there are compelling reasons. In recent years there have been major changes which would require the water distribution rules to be reviewed and revised, but this has not been done. Examples where a modification would be imperative are:

- The conversion of land under spate irrigation to new perennial irrigation systems, as in the Chasma Right Bank System requiring a redefinition of the water right on the remaining land or the development of new additional land
- The construction of new headworks as in the Nara System changing the way water is delivered (see section 1).

6. Call for codifying water distribution systems

There is a clear demand for settling water distribution issues in Nimroz and for codifying land and water rights. This in line with rising demand for land dispute resolution in Afghanistan; the percentage of stakeholders that search for outside support increased from 28 percent (2007) to over 50 percent in seven years (Warren, 2014). Similarly in other ephemeral river systems (and other water resource systems) there is much to gain in thinking through, discussing and settling water distribution arrangements and codifying water rights. There is a tendency to pay much attention to conflict resolution in the discourse on land and water rights, but as described in section 1 codifying water rights is not just about conflict resolution, but serves optimized water use and beyond this secures the operation of the water systems and protects the weakest interests. There is a case to overhaul the current ill-defined water distribution systems and clarify the management and maintenance systems. There are potential win-wins for all water users, as it will clarify responsibilities as well and create more predictable systems. It is a prime example of water system strengthening, making the water resource systems more resilient, strengthening rules and responsibilities and avoiding voids and resource capture.

Ideally the codification of the water rights would follow from the Land Law, but as mentioned this Law is still ambiguous in Afghanistan. At the same time different water rules are understood and sometimes written down, serving as a foundation for conflict resolution for instance. Also there is a well-established system for local operation and enforcement, i.e. the *mirabs* who constitute a living memory. The weakness is not so much that there are no clear water distribution rules but that they



Figure 12: Administration officer, DG Khan, Pakistan.

are not very precise and appropriate. There is a strong case for making these more elaborate and appropriate – protecting and balancing the different interests and making a stronger connection with the maintenance of the system. In the absence of regulated systems of codification as was put in place in Pakistan in the past, a systematic start can be made to discuss, improve and record the water distribution rules for major water systems. Particularly when infrastructure investment is made that in most cases will affect the way water is distributed there is an immediate urgency and also window of opportunity. It is proposed that the codified system as used in Pakistan serve as a starting point and example, including a description of the responsibilities and sanctions.

The question is how to start this codification and implement it in a way that it prevents future conflicts and improve water use systems but not cause controversies in the process. The fact that there is no regular system of codification may in fact help here – when rights and rules are debated on the basis of voluntary engagement, the chance of power play or manipulation is less.

There is no uniform system for dispute resolution in Afghanistan or for settling water rights and the systems that were there have been changed in the turbulent last three decades. Historically dispute resolution in Afghanistan was community-based and land disputes were mediated successfully in this way. However, after the 1979 coup, two decades of instability and conflict followed which weakened the social structures of the communities. Since 2002, the traditional community-based mechanisms have further weakened because of displacement, insurgency and socio-economic

changes. In a nutshell, traditional mechanisms no longer work as before.

The State itself has proven to be only partly successful in settling disputes or solving resource issues. This can be explained by the limited presence and short history of being a reliable partner, the poor numerical enforcement capability and the tainted reputation due to land grabbing, corruption or presumed partiality. Even so, from the Nimroz case studies and also from documentation from Sar-i-Pul sub-basin (AREU 2013) the State, especially the WMD, is an important but not an exclusive party in resolving water conflicts.

With the Water Law a formal status has been created for Water Users Associations (WUAs), to bring together farmers at lower level in the irrigation systems. According to the Water Law WUAs will obtain water permits. A fundamental weakness of the Water Law of 2009 however is that it relies exclusively on new unproven institutions – WUAs and River Basin Agencies – to settle water rights. From the survey in Nimroz it emerged is that the newly established WUAs are generally not trusted and are seen as politically manipulated and temporary. They do not command the respect that *mirabs* do for instance, even though these are at times criticized as well.

To settle water rights and water distribution systems requires something more than *mirabs* though. In the absence of a clear leadership, a mix of assembled authority works best. The authority can draw on charismatic local political leaders, traditional authority, government officials, the office of the Governor and even influential *mirabs*. The precise mix of authority differs

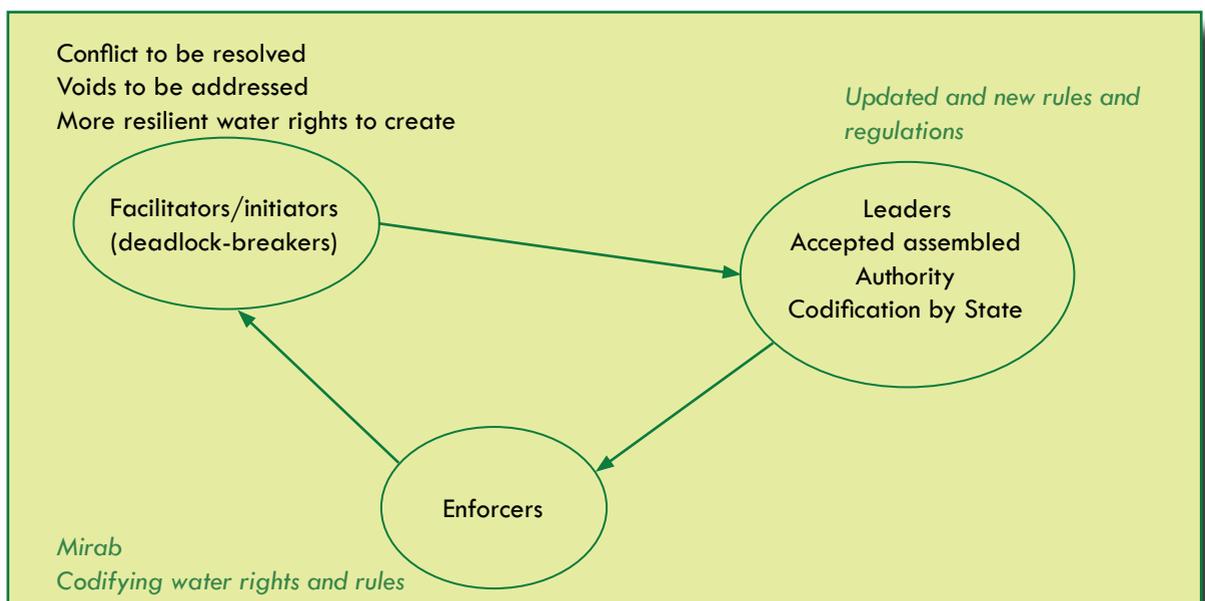


Figure 13: Categories of roles in resolving intricate water issues.

from area to area on the reputation, relations and presence of persons there. The potential contribution of such mixed platforms was also identified in the studies on water rights in the Sar-i-Pul Sub basin (AREU 2013) – recognizing the different strength of main players and the added value of combining the different roles and authorities in resolving intricate water issues (see table 3).

There are three categories of roles – the facilitators who table the issue and may even if mandated work on a resolution; the assembled leaders who give the blessing to the solution and may do some additional mediation and the enforcers. See figure 13.

Table 3: Key contributions of the main actors involved in resolving water-related conflicts

Actor/Organisation	Key contribution
Mirabs	<ul style="list-style-type: none"> Mainly conflict prevention Saatchis settle minor disputes at <i>juj</i> level Provide information and advice during conflict resolution meetings No role as deadlock-breaker
Shura/CDC/s	<ul style="list-style-type: none"> Usually settle disputes through consensual agreements at village level or between groups of villages
Provincial governor	<ul style="list-style-type: none"> Facilitator Channels complaints and sets up conflict resolution platforms if required Legitimises conflict resolution processes and involves other powerholders such as PC members
Provincial Council members/local powerholders	<ul style="list-style-type: none"> Deadlock-breakers Involvement usually facilitated by the provincial governor Bridge between government and communities
Water Management Department	<ul style="list-style-type: none"> Formally supported by the provincial governor Bridge between government and communities Channels complaints, organises logistics, etc. Provides technical information and support May attempt to resolve cases, but no authority to take final decisions
National political figures	<ul style="list-style-type: none"> Deadlock-breakers Ad hoc involvement not necessarily regulated by other actors or procedures

Source: AREU, 2013

Box 5: How to settle water distribution systems and codify water rights

- Work with facilitators and deadlock breakers, who can raise the need for the codifying of water rights
- Use either (1) conflicts or (2) the development of new infrastructure as a window of opportunity to settle water distribution rules and record water rights
- Bring representatives of water users of entire area together – so that a joint understanding of the water issues in the total areas is created
- Invest in building team relations and trust between water users in different part of the command area
- Set, if possible, a wide agenda beyond the narrow issue/ conflict at hand
- Invest enough time to understand, discuss and work out the details on areas served, distribution systems, responsibilities in maintenance and management, protection of weaker interest, force majeure and conflict resolution mechanism
- Have mixed maximum authority to settle and approve the new or updates water distribution system
- Codify the water right and make sure it is available for use and inspection – using the Pakistan example

7. Conclusions

This Guidance Note has described the current mechanism for solving water related conflicts and has made the case to settle water distribution systems and write down water rights in flood based farming systems. It has described the example of the codification of water rights in similar flood based areas in Pakistan and made recommendations on the process to follow in Afghanistan. In conclusion it wants to make a number of general points.

First, much of the discussion on water governance has been on general principles (transparency, accountability, participation) and remained at this principled level. The ‘brass tacks’ of water governance and the how to do its – such as settling water rights and water distribution systems – have often been missing.

Second, there is a risk in the discussion on water rights to focus narrowly on conflict resolution or

prevention. This is certainly important but there are other objectives that are achieved with water distribution: the protection of the disprivileged user and creating the basis for water justice, the optimization of water use and setting in place maintenance and operation systems

Third, water rights and water distribution systems are much more water permits as narrowly described in the Water Law 2009: they are collective arrangement and basis for sharing, cleverly distributing and cooperation in a large number of fields.

Finally, improving practical water governance can bring rich dividends – in optimized water use, better run systems and absence of disturbance and conflict. It is proposed to consider such efforts as investment projects similar to physical infrastructure, with calculation of costs and benefits and clear business cases. It is proposed to set up facilities to fund such high return intangible investments.

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