

## ANALYSIS OF THE TRADITIONAL *MIRAB* SYSTEM AND POINTERS FOR ITS PRESERVATION IN AFGHANISTAN

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### ABSTRACT

*Mirab* is a person or a group that provides irrigation operation and maintenance services in traditional irrigation systems in Afghanistan and nearby countries. The *Mirab* is nominated by land owners and he mobilizes beneficiary communities for participatory collective works. *Mirab* is authorized to cut illegal diversion of water from canal, identify and introduce defaulters to the communities and authorities. In-depth analysis of the *mirab* system in Afghanistan reveals that it entails some distinct characteristics in terms of: responsibility, apprenticeship process, flexibility of organizational structure, basis and process of water allocation and distribution, resource mobilization for O&M and process for conflict resolution.

At present, about 65 % of the irrigation systems in Afghanistan are operated by the *Mirabs*. This traditional system, however, has been facing many challenges due to the effects of modern day economics, changing values and norms of the society. With increasing urbanization and migration into urban centres, many younger people are leaving rural areas and deviating from practices like free labour contribution which forms the basis of the *mirab* system. Moreover, the *Mirab* system does not have legal recognition in the current institutional framework. The Water Law of Afghanistan focuses on more recent formal organizations like the Water Users Associations and Irrigation Associations as legal community institutions for the purpose of management of water resources.

This paper explores the intricacies of the *mirab* system both in terms of its evolution and its inherent characteristics reviewing the available literature and authors' observations from several case studies of irrigation systems. It then presents an analysis of its present status and outlines the major challenges being faced. The paper also attempts to describe how the system can be preserved and integrated into formal organizations so that valuable services that it was providing can be sustained by making it compatible to the present day needs and requirements.

**Keywords:** *Mirab* system, operation and maintenance of irrigation systems, sustainability, Afghanistan.

### 1. INTRODUCTION

Agriculture forms the backbone of the Afghan economy. It provides employment to 60 to 70% of the population. Recent remote sensing data shows that Afghanistan has 9.61 million ha of arable land out of which 5.5 million ha has irrigation potential (FAO, 2014). It is believed that only 2.1 million ha has irrigation facilities and another 2.26 million-ha can be brought under irrigation. After the service sector, agriculture is the biggest contributor to national GDP with up to 31% (MAIL, 2015).

Irrigation systems in Afghanistan are of five types, namely: i) modern surface systems, ii) traditional surface systems, iii) springs, iv) karezes, and v) wells. Modern

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systems represent about 10% of the total irrigated area; karezes represented about 5%; springs represent slightly more than 5%, and traditional canal irrigation systems with intakes from various rivers and streams represent more than 80% (Anderson, 2006; FAO and AIMS, 2004).

The traditional irrigation systems in Afghanistan have been historically well managed, maintained and organized by the local communities. Operation and maintenance of these irrigation systems are carried out by local water users, typically headed by a water master, locally known as *mirab*. This word "*mirab*" comes from a combination of the Arabic word "*mir*" (or *amir-emir*) which designates a leader, and "*ab*", the Dari word for water. The same word is also used in Iran and Central Asia. Even though it is somewhat similar to *mayordomo* or *theaceqias* of Mexico, *amazil* of Morocco or *canalero* of northern Latin America, it has its own specificities. Several previous studies on the topic describe the traditional role of the *mirab* as a service provider and the arrangements for water allocation and maintenance work over generations, both in times of war and peace (Lee, 2007). The *mirab* system has been observed to have a long history and possess its own characteristics that have been well integrated into the country's natural and social background (Roe, 2008).

## 2. EVOLUTION OF THE MIRAB SYSTEM

Afghanistan has a long history of settlements dating back to Mesopotamian era (around 7,000 BC). Throughout this history, agriculture has been found to remain as the main source of livelihood for the Afghan community. Owing to the aridity of the climate, irrigation has always remained a key priority for the area. By 2,000 BC large tracts of land were believed to be under irrigation in Afghanistan (Viala, 2003).

Historically, irrigation was supplied by traditional irrigation systems. These are systems with few or no engineered structures and which generally rely on earthen water conveyance and control structures for water delivery. They are widely distributed throughout Afghanistan. Their sizes vary widely from a few hectares in high mountain valleys to extensive networks covering thousands of hectares in the plains. Reflecting the distribution of irrigation in the country, these systems also exist most extensively in the larger lowland provinces (Qureshi, 2002). In most cases, they have existed for generations and have undergone many physical and social changes. They have expanded or, in some cases, contracted as a result of water availability or the challenges posed by conflicts (Viala, 2003). It is estimated that there are nearly 29,000 traditional irrigation systems in Afghanistan.

In ancient times, as the farming communities expanded irrigation networks with their local resources and knowledge, they also realized the need to develop methods for controlling and managing them and, thus, gradually developed means for operation and maintenance. They developed procedures for allocating and distributing water and for mobilizing locally available resources. Realizing the importance of the decisions in this regard and considering the fact that decisions need to be unanimously accepted, the responsibility was entrusted to some elder in the community. That is how the *mirab* system is found to have been originated in Afghanistan (Viala, 2003). It can be viewed as the response of the Afghan communities to the need of social water management. The *mirab* system is found to have been further strengthened by a symbiotic relationship between water-master and water users (Vincent, 2009).

However, with the passage of time, the *mirab* system also seems to have gone through many ups and downs. Historical review of the *mirab* system of several irrigation schemes in Afghanistan has revealed that it is also not solely community based and is highly influenced by events and forces swirling around it (Vincent,

2009;Roe, 2008; Lee, 2007). The following sections provide details of some time periods when the *mirab* system underwent some significant changes.

## 2.1 Mirab System in Ancient Times

Existing literatures of ancient times reveal that water in this area has frequently been a matter of conflict between and within local communities. Yet, realizing the importance of water, the local communities seem to have put their differences aside and come together with some form of social water management that has evolved as the *mirab* system (Ziaee, 2015). The expectations of the farmers were not so high as they were mainly engaged in subsistence farming. Hence, except for issues related to personal or communal egos, the *mirab* system which was basically built on customary norms is believed to have been quite successful in addressing the concerns of the farming community.

## 2.2 Mirab System at the Period Before the War

The *mirab* system have come under some pressure from the 1940s when some development works like sugar and cotton factories were established in Afghanistan. This is seen as a transition from being “supply-oriented” towards “management oriented” phase (Vincent, 2009). Initially, the focus was driven by the Government on improving supply and drainage. As it increased its stake in the irrigation system by buying land for cash crop production, the Government understandably took steps to protect its interests. Thus, a government-driven management system took over to ensure that the overall increased demand was met with the water supply. At this point, the canal communities’ decision-making power over the resource eroded. The decisions became top-down and protected government interests. During this period, water rights were not explicitly defined. However, it was the farmers’ duty to grow a certain crop. The Government could control water demand by limiting rice cultivation and thus limiting water use upstream. The community mobilised and controlled labour for canal maintenance with the support of the *mirab*. Maintenance was shared equally, with each household contributing labour for the same number of days. Water use and maintenance requirements were not linked. In summary, the period from 1940s to 1970s was one of change in the local water management institutions in terms of external influence like government, markets, etc. and enhanced role of local government in promoting and supporting collective action for water management.

## 2.3 Mirab System during the Period of War with Soviet Union

The war with the Soviet Union triggered key changes in the *mirab* system. The rapid collapse of local government led directly to the *de facto* end of restrictions on the upstream cropping patterns and the end of incentives for tail-end farmers to cultivate more. Overall, it caused severe impact on the canal system and its management. The community was divided into different fractions. It was very difficult for farmers to properly maintain their intake system. The water availability in most systems decreased substantially. Land was abandoned and a large number of villagers migrated to safer parts of the country or even abroad. The canals became silted up and degraded. Some canals were even used as trenches for outposts to launch ambushes and to fire from (Jackson, 2009). The vacuum left by the collapse of the state was filled by new power-holders (the commanders) who used the irrigation canal and the water flow for income generation and to demonstrate their power and influence. The Soviet invasion period drastically affected the elements of trust, cooperation and social cohesion among all actors within the irrigation systems, leading to a complete collapse of collective actions and cooperation for water management (Ashraf, 1995).

## 2.4 Mirab System during Taliban Regime (1999-2001)

During the Taliban's rule, the *mirabs* reinstated their positions but villages did not organise any elections. Although the Taliban did not have a stake in the canal's management, they influenced local affairs, especially with regard to enforcing rules. In some cases the Taliban police even patrolled the main canals and got involved in conflict resolution. Those *mirabs* who were able to develop good relationships with the Taliban were in a relatively good position. Some *mirabs* were even able to get the Taliban local government to enforce water turns. Attendance at canal maintenance duties also improved dramatically during the Taliban time because most farmers feared the Taliban. The farmers heard stories about the Taliban's violent behaviour in other areas and even witnessed it in their own canal. Some *mirabs* used this to their advantage and received better participation for maintenance (Vincent, 2009).

## 2.5 Mirab System at Present

Traditional systems have more or less survived 20 years of turmoil because the communities have been able to preserve some type of cooperative management of water resources, and *mirabs* are still today selected and put in charge of supervising the irrigation processes. Some traditional systems suffered more because they happened to be located on battle frontlines and their infrastructure was destroyed. There are definitely encouraging signs of recovery in most traditional systems. From a rehabilitation perspective, some external assistance has been provided and some more is needed to bring back these systems on their feet, as most Afghan farmers are poor and do not have enough resources for rehabilitation (Dennys, 2009).

## 3. SPECIFIC CHARACTERISTICS OF THE *MIRAB* SYSTEM IN AFGHANISTAN

The *mirab* system is distinctly characterised in terms of: responsibility, apprenticeship process, flexibility of organizational structure, basis and process of water allocation and distribution, resource mobilization for operation and maintenance and process for conflict resolution.

The *mirab* is an individual, appointed from among the landowners by the landowners for a given period of time (one to several years). He is entrusted with the responsibility of irrigation water allocation and distribution within the system is made responsible for all decisions. *Mirabs* generally belong to the same community and are elected through *shura* (the village or community gatherings). They are usually respected elders that act altogether as a steward of the water conveying infrastructure, a controller of water flows and as a facilitator of allocation disputes. They spend a lot of time walking along the canals, inspecting regularly the river intake, the main canal, secondary canals, control structures and turnouts.

Another important feature of the *mirab* system is that it includes an apprenticeship process. Most, if not all, *mirabs* start as assistant *mirabs* (called "*checkbachis*") and only after serving in that position for a period of time, graduate to the higher position. Some *mirabs* "inherit" the position from their father after having served as an assistant for a considerable length of time.

The organizational structure of the *mirab* is also quite flexible. It varies depending on the size and layout of the irrigation scheme. In some cases, there is one *mirab* (with some assistants) for the main canal, who controls the canal intake and the distribution into secondary canals. Longer canals can be operated by two (or maximum three) *mirabs*, one being the upstream *mirab* and the other being the downstream *mirab*. They confer on major decisions, but each of them maintains his part of the canal and

operates the turnouts. Secondary canals can be managed by *sub-mirabs* or directly by the communities.

Another characteristic of the *mirab* system is that water allocation regime is based primarily on landownership and share of contribution to the infrastructure maintenance. There are usually different levels of allocation processes: the head *mirab* (*mirabbashi*) manages and allocates water along the primary canal, while along branch or secondary canals (each usually serving a village or a community), water resources are allocated by *sub-mirabs* or directly divided by the communities/villages served.

Operation and maintenance for irrigation structures under *mirab* system is fully carried out by the local community by utilizing their own financial and social capital. As the controller of water flows, the *mirab* and his assistants personally operate or supervise the opening and closing of the various structures which distribute water from the main canal to the secondary and tertiary canals and then to the individual fields. Allocation of water is made based on different types of measurements at the intake and along the main canal through proportional weirs and, at times of drought, a detailed timetable is drawn by the *mirab* and water turns are implemented. Similarly when maintenance works are needed, either because of ageing or because of damaging events (generally floods), the *mirab* mobilizes the community members served by the system to provide free labour. If, for example, the intake of his canal is damaged by the river flood, the *mirab* will mobilize the necessary farmers with their own tools and work under his or his assistants' supervision to rebuild intake. These workers, through the provision of free labour, informally renew their rights to get water. It is common practice for *mirabs* to keep track of who showed up or not, and those who repeatedly do not participate in canal repair and maintenance will be denied water. These managers are usually paid by the landowners within their management area.

As the facilitators of water disputes, the *mirabs* regularly solve minor disagreement on the spot. This is usually achieved through consultations of all parties and arriving at a consensus or lacking thereof, use of the *mirab*'s individual authority. Major quarrels are referred to the *shura*, the village or community council (also called *Jirga* in Pashtu). The dari word '*shura*' comes from the Arabic '*mashwara*' (to discuss). It describes the traditional advisory council formed to solve conflicts, or deliberate on decisions affecting the community. The core of such councils comprise those whose opinions, negotiating skills and knowledge of tribal and/or religious law are respected, usually including elders, religious authorities, and local leaders. Any male head of household can attend the *shura*, all parties attending the *shura* are allowed to speak but obviously all voices in the *shura* are far from equal. While the council itself may have no direct means of enforcement, its authority is respected, and those who do not comply with its decisions will find themselves at odds with the community.

Water users, beyond the provision of free labour for the maintenance of the infrastructure, pay the *mirab* and his assistants for their services. The price varies, but the average "salary" for a head *mirab* seems to be one "man" (about 5 kg) of wheat per *jerib* (about 0.19 ha). Most *mirabs* acknowledge that not all farmers pay, and that they tend to classify households per their wealth. The poorest households do not pay and are not held liable as long as they provide labour. While peer pressure and social constraints demand that rich households pay their dues regularly.

## 4. CHALLENGES TO THE *MIRAB* SYSTEM

### 4.1 Economic Growth and the *Mirab* System

Afghanistan's economic growth is dependent upon agriculture production and irrigation is critical for it. Management of irrigation water, either through community based management practices or government led water user associations, is of utmost importance for increased productivity. Introduction of modern irrigation practices and formal irrigation systems can also offer greater job opportunities to the growing population.

Increase in the price of agriculture inputs (fertilizer, insecticides, pesticides, seeds, machinery) has limited a farmer's resource to buy and thus limited their ability to grow more and bring more area under cultivation. Above all, lack of modern irrigation facilities, less knowledge on on-farm water management practices and shortage of irrigation water has also affected the agriculture growth of Afghanistan. Under these constrained circumstances, a *mirab* is often not paid fully for the services he provides to the farmer community. A *mirab* has to accept whatsoever is given to him and thereby it has evolved to situations where some *mirab* even compromise in terms of favouring those who paid or those who pay him higher than others and consequently lead to unequitable distribution of water.

### 4.2 Legal Status of the *Mirab* System

Even though the *mirabs* are playing a vital role in the operation and maintenance of an irrigation scheme in Afghanistan, they are not recognized as legal entities. There are no laws or by-laws pertaining to them. Hence, they have no legal authority. It is necessary for the government to recognize the crucial role that they are currently playing. In terms of policy, the 2004 draft Irrigation Policy states that the *mirab* system shall serve as the basis for guidelines for the formation of water user association.

The role of *mirab* in irrigation water distribution is of utmost importance but it sometimes faces difficulties in the form of interference from war lords or powerful water users who do not allow diverting the full share of water among other farmers. This is perhaps because of lack of support from the government authorities to the *mirabs*. Behavioural changes due to long wars have significantly degraded the traditional *mirab* system thereby causing breakdown of traditional mechanisms for water distribution among the farmers.

Since a *mirab* system is a community based irrigation water management system so it is obvious that *mirab* is paid by the community/farmers for the services it provides to the community. The economic condition of a *mirab* is generally not good enough to survive without financial support from the farmer community. Hence, legal status is also required for their financial stability.

## 5. CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Conclusion

The overall conclusion from the historical review and the analysis of the effect of externalities of the *mirab* system is that it has undergone many changes over time. During the long war in Afghanistan, the *mirab* system was adversely affected. Before war, this system played a significant role in the distribution of irrigation water among the water users and in resolving water issues. With the collapse of Afghan government during wars, canal water management systems throughout Afghanistan also collapsed and created a vacuum which was filled by the commanders who used

irrigation water as a source of income and also to show their power and political influence thereby undermining the effectiveness of the traditional *mirab* system.

Today the role of the *mirabs* is as crucial as ever, not only because of the activities they do, but also because they represent the social cohesion of communities demonstrating that they can come together and act as one for common good. Their need is multifold, from the construction of infrastructure, technical training on water allocation and use efficiency, to the provision of equipment or rural credit. Extension services have to be developed to improve agricultural practices, and sensitization to equity issues should be introduced, looking at poorest segments of the population. The underlying key question is how to strengthen the informal water user associations led by *mirabs* without disrupting them.

## 5.2 Way Forward

Considering the prevailing Water Law which promotes the formation of Water User Associations (WUAs) and Irrigation Associations (IAs), there is a need to identify ways for forming or organizing new institutions so that they improve, or at least does not worsen the status-quo of the current *mirab*. In this concern, the *mirab* system should be considered as an important link between the government agencies and the farmers as it represents the social cohesion of communities. The *mirab* system in collaboration with water user associations and irrigation association may result in better irrigation water management at community level. Most of Afghan *mirabs* are not progressive and do not have knowledge of modern irrigation practices and, they need a comprehensive training on irrigation water management and exposure visits to various irrigation facilities to observe the recent developments in the irrigation sector. Caution should be exercised during rehabilitation assistance as there is a clear danger of further disrupting the social organization. Paying workers to clean a canal while farmers are supposed to contribute free labour to do so can be considered for heavily silted up canals, but not for yearly clean-up operations. The farmers will not work for free if they can get paid for the same labour. This can have significant consequences on the way the community handles irrigation systems since it is directly linked to the water rights of individuals. Often well-intentioned interventions can have negative repercussions. Our interventions should be well thought out to integrate the *mirab* system into the modern irrigation management functions. This will give continuity to accepted traditional practices and help make the systems sustainable.

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