

Commons identity crisis, can it be resolved?

Empirical analysis of the success factors of water user associations establishment in Jordan  
Valley

Mai Nusir

Brandenburg University of Technology Cottbus-Senftenberg,  
German Academic Exchange Services (DAAD) Global Centers

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## **Commons identity crisis, can it be resolved?**

### **Empirical analysis of the success factors of water user associations establishment in Jordan Valley**

Mai Nusir<sup>1</sup>, Amani Alassaf<sup>2</sup>, Charlotte Gerling<sup>1</sup>, Frank Wätzold<sup>1</sup>

<sup>1</sup> Environmental Economics, Brandenburg University of Technology Cottbus-Senftenberg,  
Erich-Weinert-Straße 1, Building 1, Cottbus,03046, Germany

<sup>2</sup> The University of Jordan, Jordan

#### **Abstract**

Jordan is classified to be one of the most water-scarce countries in the world, The main challenges facing the agricultural sector in Jordan are water availability and water quality. The social, economic and geopolitical context of the Jordanian community impacts the process of managing common-pool resources in general, and in managing irrigation water distribution in Jordan Valley (JV) in particular. JV is the primary agricultural hub and region of the country; this position has encountered challenges over time due to increased water resource constraints and degradation which hugely affected the agricultural sector in the region.

Water User Associations (WUA) were created in the early 2000s as a response to encountered risks and challenges by natural and socio-economic factors in the region, The roles of distributing irrigation water to agricultural units, maintenance of water networks and representation of farmers in JV were given to WUAs' by Jordan Valley Authority. The agreed-upon tasks to be assigned to the WUAs' are deemed insufficient according to members of the WUAs'. With the rising risks of climate change and social factors, a temporal institutional analysis of the WUAs' role in JV irrigation water distribution is done by developing a future-oriented modified version of the IAD framework, which highlights the role of informal institutions in institutional change.

## **1. Introduction**

Water scarcity is set to be one of the main global challenges of the 21<sup>st</sup> century, and agriculture stands as the largest consumer of the world's freshwater resources (FAO, 2007; FAO, 2014; Vadez et al., 2023), accounting for about 70% of global withdrawals (McDermid et al., 2023). However, there is potential to reduce the agricultural sector's water consumption through improved water resource management (Vadez et al., 2023). The Irrigation Management Transfer (IMT) and Participatory Irrigation Management (PIM) global approaches have been introduced to enhance irrigation water management through increasing the participation of farmers and water users in the process (Senanayake et al., 2015; Nigam et al., 2023). Developing countries increasingly adopted the IMT approach by establishing Water Users Associations (WUA) (Shyamsundar et al., 2005; FAO, 2007; Altz-Stamm, 2016).

Jordan was one of the countries adopting the IMT and PIM approaches since the early 2000's by establishing WUAs in Jordan Valley (JV) (FAO, 2007; GIZ, 2010, Altz-Stamm, 2016). Jordan ranks second in water scarcity within the Middle East, and holds the third position worldwide as one of the most water-deprived countries, as reported by USAID (2018).

The establishment of WUA in JV is considered to be a successful co-management approach of irrigation water in JV according to the Ministry of Water and Irrigation of Jordan (MWI). Investigating the successful implementation of WUAs in JV requires the consideration of the full institutional setting, therefore in this research, we consider both the formal and the informal institutions in the institutional analysis conducted. We define institutions as the rules that people use when interacting in repetitive and structured situations, formal institutions refer to the set of rules within a normative hierarchy, like those that can be found in modern legal systems. On the other hand, informal institutions refer to a set of conventions, norms of behaviour, and self-

imposed conventions. such as tribal conventions (North, 1990; Ostrom 1990). Previous research on the field of common-pool resource management has paid little attention to the interplay between formal and informal institutions and its' effect on institutional outcomes (Kafouros et al., 2022); Jordan's national identity has been influenced by tribal traditions, and Jordanian tribes have a long history of self-governance and management of their disputes, relationships and natural resources. Tribes are one of the most significant forms of informal institutions in the Middle East (Watkins, 2014). Both formal and informal institutions equally contribute to either a sustainable management or overexploitation of common-pool resources (Pellowe & Leslie, 2020).

This study aims to analyze the institutional change that irrigation water management went through in JV which led to the successful establishment of WUAs. In order to pinpoint the key drivers that influenced the institutional outcomes of irrigation water management in JV. Furthermore, to include this interplay in the IAD's framework core.

To conduct the institutional analysis of the WUAs establishment in JV, we combined ethnographic fieldwork with qualitative research techniques. This approach involved conducting semi-structured, in-person individual interviews with key stakeholders, including officials from the MWI, officials from Jordan Valley Water Authority (JVA), and farmers. Subsequently, the data collected through these interviews was analyzed and applied to the Institutional Analysis and Development framework (IAD) by Ostrom (2005). This analytical framework provides a structured approach for analyzing and understanding the ways in which institutions operate and change over time (McGinnis, 2020), and it has been widely used to analyze and understand the factors affecting common-pool resource management and community-based irrigation water management in our study area, and the IAD serves as a multi-tier conceptual map (Ostrom, 2011; Ostrom, 2014).

Analyzing the data prompted a modified version of the IAD which better represents the factors that affected the successful establishment of WUAs in JV. The modified version highlights the role of informal institutions in institutional change.

The rest of the paper is organized as follows; Section 2 provides an overview of the study. Section 3 presents the methodology adopted. Section 4 showcases the empirical results and the data application to the revised IAD framework.

## **2. Case study**

The water sector in Jordan Valley is managed by the Jordan Valley Authority (JVA), which was established in 1977 to be responsible for the social, economic, and overall, the integrated development encompassing all aspects of life in Jordan Valley. In 1988 it became part of the Ministry of Water and Irrigation (MWI).

In the late 1990's, the management of JVA faced numerous challenges, like maintenance costs and the deterioration of water networks, while the management of bulk water by the JVA proved successful, the distribution of retail irrigation water experienced a gradual decline in efficiency (GIZ, 2010). Consequently, farmers began to lose trust in JVA's performance and operation, this situation gradually resulted in farmers' reluctance to cooperate with the JVA (GIZ,2010).

This situation prompted the introduction of WUA in JV as a co-management approach. The process of introducing WUAs took around 3 years; this is because of the time needed to convince the local community and to gain their trust (GIZ, 2010).

Farmers were reluctant to participate in WUAs due to their past experiences with agricultural associations, which had no clear legal stand and did not include the local community in the management process. WUAs gained their legal stand as a part of the Jordanian cooperative cooperation in 2008, and the participation rate of farmers increased by 70% (Altz-Stamm, 2016).

According to officials from the MWI and JVA in addition to farmers in JV, the performance of WUAs is satisfactory and is considered to be successful in delivering its' aims and goals.

### 3. Methodology

The IAD framework has been widely applied in studies of common pool resource (CPR) management (Villamayor-Tomas et al. 2019; Lai & Zhao, 2023). According to this framework, the factors that influence the performance of CPR management fall into three categories, referred to as "the exogenous variables": (i) biophysical attributes, (ii) community attributes, and (iii) rules in use. These attributes play a critical role in the formulation of action situations, the development of rules, and the management process itself. Ultimately, they influence the performance of the irrigation system (Wang & Wu, 2018; Leroy, 2023).

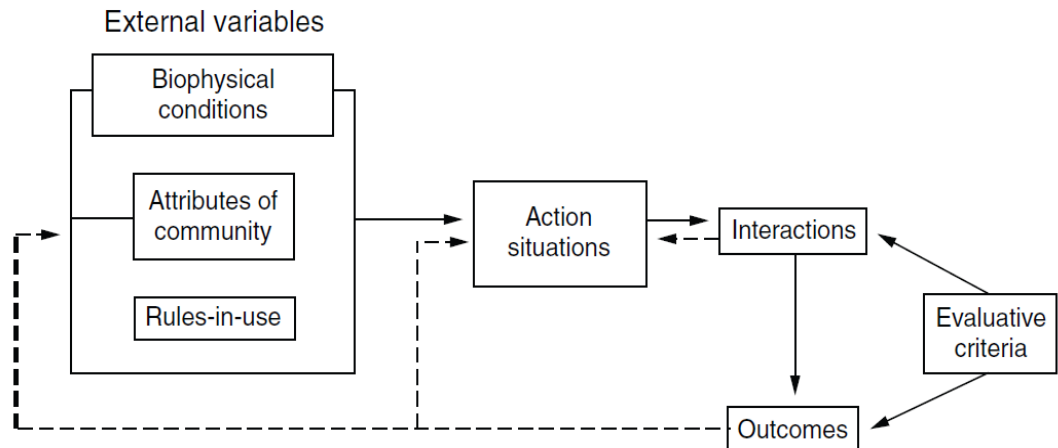


Figure 1: The IAD framework, Adapted from E. Ostrom 2005.

In order to apply the IAD framework to the institutional analysis of our case study, an introductory field trip was followed by a two-month data collection trip. During this time, a combination of ethnographic fieldwork and qualitative research methods were used (Leroy, 2023) by conducting

individual interviews with farmers and officials from both the Jordan Valley Water Authority (JVA) and the Ministry of Water and Irrigation (MWI) of Jordan. The sample size followed the principle of data saturation, which occurs when newly collected data produces little or no new information, themes, or codes (Mason 2010; Leroy, 2023).

The following steps were the processes of translating and typing the interviews, followed by sorting and analyzing the data. The qualitative method used for this research is qualitative coding, primarily deductive coding was used, which refers to the use of a pre-existing set of codes (Linneberg & Korsgaard, 2019). The IAD attributes served as the basis for this coding stage. The second stage was inductive coding, which refers to the process of generating and developing codes directly from the data (Linneberg & Korsgaard, 2019, Leroy, 2023). This allowed us to "customize" and adjust the framework to better fit and represent the data collected and the community of interest.

The interview transcriptions, data sorting, and both coding procedures were completed using Excel. The coded data were then applied to an expanded version of the IAD framework and then analyzed accordingly.

#### **4. Results**

The process of qualitative data analysis was undertaken with a focus on understanding the impact of informal institutions on institutional outcomes and change in the irrigation water management sector in JV, alongside a focus on the interplay between formal and informal institutions. It was found that the 'exogenous variables' of the IAD framework, which represent the institutional setting of irrigation water management in JV, are viewed through a lens of 'threat' by the local community. This perception significantly influences policy implementation and interactions within the action

situation regarding the process of irrigation water management in JV, ultimately imposing 'challenges' on it.

The flexibility characteristic of the IAD framework (Chua & Yau, 2022) facilitated the further modification of the framework by introducing a customized extended version, the extended version encompasses two new extensions; the “Threats” attribute before the “exogenous variables” and “Challenges” attribute before the “action situation” of the IAD framework (Figure 2). The annexation of these two extensions to the IAD framework helps in grasping the complexity of reality and engages informal institutions, local viewpoints, and history in the essence of the IAD framework. Informal institutions are an important factor and tool for policy change (Hajer, 1995; Clement, 2010). The extended framework also adds a temporal dimension to the IAD framework by presenting past experiences in the threats attribute.

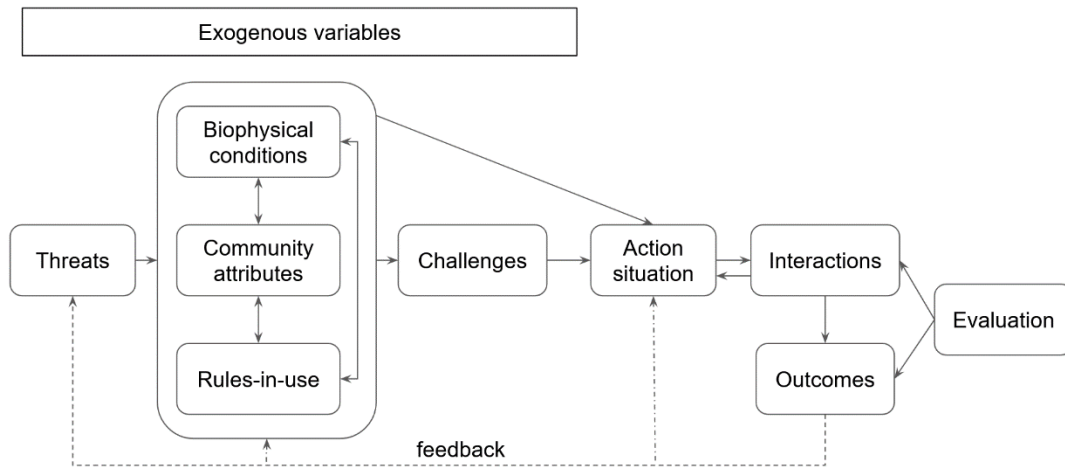


Figure 2: The extended IAD framework (Temporal IAD framework)



The threats attribute refers to the community's perceptions, past experiences and narratives, while the challenges attribute refers to the challenges posed on the action situation and the interaction patterns. Using these attributes reluctance of farmers to participate can be understood and addressed using proper policy implementation.

Applying this version of the IAD framework to the process of WUA establishment in JV provides a comprehensive representation of the process from both sides: the formal and the informal side of institutional change. These attributes can better encompass the factors which led to the successful establishment of WUAs in JV.

## **5. Discussion & conclusions**

A wide range of frameworks analyzing and assessing the sustainability and performance of agricultural policies and programs overlook the socio-cultural dimension of sustainability (Amaruzaman et al., 2022). The two annexed extensions add a 'costumed' social dimension to the analysis and force the analyst and policy-makers to consider the local-community narrative in the institutional analysis, whether it is for research purposes or policy implantation purposes, the revised version can also serve as a tool for policy suggestion analysis.

The strong tribal influence in JV prompts WUAs to strive for wider control over the process of irrigation water management with no intervention of JVA, while JVA keeps emphasizing its' administrative role and control over the overall process of irrigation water management in JV. Resolving this issue takes a larger consideration of the informal institutions effect in the future and to leverage it toward a solution which satisfies both the local community and the JVA. Therefore, utilizing the extended temporal IAD framework can aid in resolving the issue by encompassing informal institutions at the core of the institutional analysis.

It is worth mentioning that Clement (2010) developed a “politicized” version of the IAD framework which included a “discourses” extension, similar to the “threats” extension of our version, however not the same. While Clement (2009) focused on expanding the framework to higher government and institutional levels, our research focuses on the collective-action level and recognizes the process of irrigation water management in JV as a bottom-up process (Al Adwan & Hayek, 2011).

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