

1. INTRODUCTION

Water connects and this is its distinctive quality. Water could be seen as an object of the social and cultural production produced through social relations and enriched with transmitted patterns of meanings through cultural systems. At the same time, it is also a generative component of the relationships, values, and perceptions that structure the society [1, 2, 3]. In addition, water constitutes the long-term hallmark of environmental anthropological inquiry dated back to 1893. Frederick Webb Hodge [4] in his essay, offered intriguing insights into the irrigation system of Pueblo Indians, in Arizona [2, 5]. Anthropology and the ethnographic method, from that era, continue to the present, entangled with other scientific frameworks and they have significantly contributed to the evolution of the theory of the commons as well [6-15]. This in turn has caused an increasing interest in the perception of the traditional/indigenous systems.

The term traditional in the context of irrigation refers to the period in which the irrigation was not only a technique to control water for crops, but also a practice in which local communities, water as a common pool resource, and a net of relationships were evolved. This is the time when managerial schemes were developed according to local priorities, and decision-making processes, set ground rules and assign roles to community members. All these elements outline the social, political, and economic context in which a traditional irrigation system defines the land, the water, and the community. The legal regimes and the institutional tools for water governance are based on social conditions, cultural traits and customary law [16]. Collective action and self-governance, laid in the core of the theory of the common-pool resources (CPRs) or commons [17]. Commons or common pool resources refer to historical or modern forms of self-organization communities and resources or goods held or collectively produced by communities. Commons connote that a community manages, produces, and distributes jointly through collective participation and cooperation. This ensures equal access to resource beyond individual property and profit within a competitive context and beyond public state ownership through hierarchical centralized and bureaucratic administration. The community builds social links, meets social needs, promotes democratic participation and self-management in the economy, society and other fields, and cultivates the ideas of collaborative production and self-organization [18-22].

This work discusses how a community manages an irrigation system and water supply, for more than a century. Two common pool resources, the canals pose a provision problem since they need an adequate maintenance whose cost are shared by the users, and the water (its allocation according to the local needs, norms, and patterns of behavior) constitute a commons, the irrigation system. Social norms and patterns of behavior in terms of socially defined water usage are components of the life of the village. The paper reveals that the traditional management of the water has not been modified, although the political and the economic conditions have been radically transformed.



Photo 1: The canal today

3. THE IRRIGATION SYSTEM

Their survival or economic performance of the villagers, until recently, was mainly depended on this irrigation system. The technology of traditional irrigation systems is adapted to the natural terrain of each landscape. Leibundgut and Kohn [16] noted that there are two main types of traditional irrigation systems; slope irrigation in mountainous or hilly areas and flush irrigation used in valleys or flat areas. The second type of irrigation allows water to slowly flow and slips over the surface. The deliberate flooding by simply cutting one canal is widespread in many areas in Europe [16] and was adapted by the villagers of Nikoleika, by making use of gravity. The gravity system is used as the water level of source is higher than the level of the fields in the irrigation scheme. Through canals the water approaches the yards, gardens and the fields of the community and then according to the local schedule, every day, a different part of the community waters its gardens and fields. Water is directed to branch canals either by limiting the width of the canal itself, or by constructing simple metal gates to limit the water entering a branch canal.

Using this irrigation system to transfer water from the spring to the fields requires extensive labor to maintain. The community and its local government council set the rules of irrigation, according to customary laws. The community of the village farmers repair and maintain the irrigation network which runs through the village, offering their time and their manual work. One of the villagers is the responsible for the fair distribution of the water. That means he needs to pay equal attention to the demands of all the members of the community. At the same time, he needs to keep water available and accessible to all, according to the schedule that the local board has developed. The distribution of the water is in accordance with a time schedule. The fields and the gardens are of comparable sizes, and the villagers know that in certain time periods for some hours they have access to irrigation water the time density was a crucial matter of negotiation every year especially the past decades. The canals transfer water to their farms "since time immemorial", as they usually quote when they are asked how old their irrigation system is. Since the Ottoman era, in the Greek rural areas communities and their function define every realm of the social life. Reforms from the end of the 19th century recognized the rights and jurisdiction of local administration and offered greater governance autonomy. This allowed the maintenance of social organization based on the customary law and cultural dynamics. Customary law is a set of practices and performs recognized as rules and procedures by local communities. Customary law consists of local norms and protocols as part of a wider set of tools for protecting the life of not only humans, but also plants and animals. Customary law also protects beyond the natural life by supporting the social and cultural life. Although the law is not written and recorded on official documents, the decisions taken by the village board are written with reference to customary law. After the 1960's a municipal networking of drinking water was established, and many fields or gardens transformed into private homes and apartment buildings equipped with tap water for drinking and irrigation. However, the villagers continued to preserve the same irrigation system. But now, they do not participate in reserving the infrastructure by their work, or by electing the responsible person for the distribution of the water. Now they pay for workers to repair the canals and they pay, a villager, to be responsible for it. Local governance was officially reorganized in 2011 according to the so-called Kallikratis Plan. Since then, the community has lost its political power and there is no community board. Instead, a representative of the community participates in the municipal board that consists of representatives of other villages and towns.

2. METHODOLOGY

This case study was conducted in the west region of Greece. The climate is typical Mediterranean with mild winters, and hot, dry summers. The region is relatively mountainous with olive groves, vineyards, and agriculture (small, irrigated lands) as the main land uses.

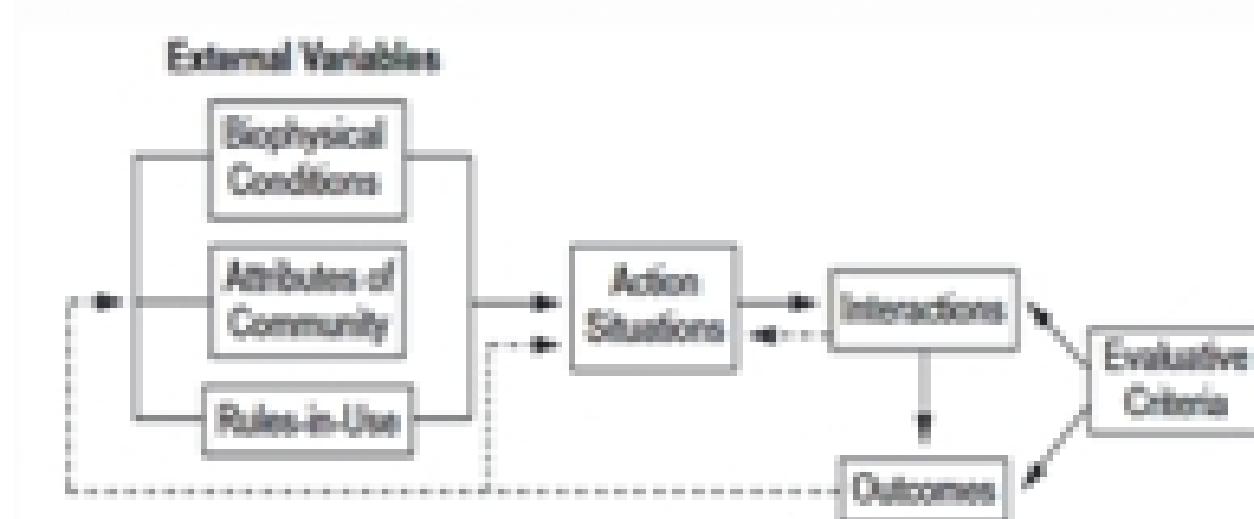


Figure 1. A Framework for Institutional Analysis.

Fig. 1. The IAD framework.

Source: Ostrom, 2011.

Streams and springs are plentiful creating a green landscape. Today, the crops of the small, irrigated lands, which are produced in the (back) yards of the residential areas, are mainly for domestic use. The irrigation system belongs to the community of Nikoleika with a population of 443 in 2011. Nikoleika is a village by the sea near the city of Aigio a port city which has flourished since 19th century to 20th century benefited from its role as an export port for the agricultural produce of the vineyards of the surrounding area, including Nikoleika village.

4. DISCUSSION AND CONCLUSIONS

Traditional irrigation systems are an example of how people change and adapt to the natural environment. Their function is linked to the local knowledge acquired by the communities that invented and maintained them according to the ecological and social characteristics of each landscape.

Village irrigation, as a common property resource management, requires those who use irrigation water, distribute water and resolve any disputes related to the distribution and use. This way, the rural populations managed to consolidate by preserving their cultural identity and keeping the integrity of their community. Regarding environmental sustainability, these systems compose landscapes that protect biodiversity, regulate the hydrological cycle, recharge underground aquifers and springs through water filtered by irrigation canals and surface irrigation. Surface irrigation makes the soil fertile and prevents bracking, while at the same time this irrigation system contributes to the increase of relative humidity, the reduction of maximum temperatures. Furthermore, this irrigation system is an effective tool in the effort to adapt to climate change and an important part of the local cultural heritage.

Villagers who steal water or do not contribute to the maintenance of the canals, or intentionally damage canals and water control structures for their personal benefit have been frequently reported in the literature discussing traditional irrigation systems. By the "tragedy of the commons" Hardin challenged the fundamental belief that rational human beings, acting for their own benefit, can achieve collective logical outcomes, ending up with the bleak picture of the total destruction of Nature and Humans.

Ostrom and her scholarship developed the conceptual framework, or more precisely the context of the community, defined by a set of variables, conditions, and concepts. The community overcomes the tragedy of the commons, through cooperation, reciprocity, and direct democracy and proves that individuals can self-organize and be inspired by systems of management and co-evolution of Nature and Society. This irrigation system operates as a 'collaborative project' establishing a conceptual framework of the fundamental principles of democracy, justice and solidarity. The economic, social, cultural, and political activities and their interconnection shape the landscape in which the logic of collective action constructs the specific socio-ecological system. Communication, trust, anticipating threats and challenges, reciprocity and solidarity are mechanisms that control behavior and define the water allocation. The community builds social links, meets social needs, promotes democratic participation and self-governance promotes the ideas of collaborative production and self-organization. Commons denote collaborative management and commoners decide what activities, they engage with and with whom they will collaborate, practicing commoning to implement plans and strategies.

The allocation and distribution of water, as well as repairing the canals and other structures, is under the supervision of the community. In the present time, as the survival dependence of this irrigation system is diminished, those who receive water from the system do not join annually to reconstruct, repair the irrigation canals as these works are assigned by payment to a farmer, but they keep this type of irrigation in a modern society, and they are still responsible for the cleaning of their branch canals which run along their land. Commons as an enduring form of organization is not inevitable, but neither is it difficult or rare. Even if commons are not formally recognized, and not necessarily subject to any of the known modern political and economical structures, they still have the power to survive as an essential part of local history and heritage and a fundamental feature of rural landscapes.

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