

# Nayband Irrigation System

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## 1 Part I: Static Analysis - Collective action

Nayband village is located in central Kavir Rural District, Deyhuk District, Tabas County, South Khorasan Province, Iran. Based on the data from the 2006 national census, the village has a population of 484 with 133 households. Basically, the Nayband community is a group of smaller villages (Kalata) located in the foothills and on the lower slopes around the base of a mountain of the same name approximately in the center of the deserts of eastern Iran. In this analysis, the name Nayband is used to denote only the main village where the great portion of the population resides. The village is basically far from developed urban areas and almost isolated from any regional market. In this connection, the main source of income is identified as agricultural activities which depend on one major and several minor natural springs. The economy of the village is diversified to agriculture, pastoralism, and the trade of goods and services to the passing caravans and migrant labors in nearby mines. Despite the diverse economic activities, the Nayband community is heavily dependent on the income from agricultural activities.

This case study is based upon ethnographic research conducted by anthropologist Brian Spooner in the area during the summer of 1970 and was part of the original Common-Pool Resource (CPR) database. Spooner's analysis of the agricultural communities in the area simultaneously analyzes the ethnographic context ca.1970. The resources in the system (natural infrastructure) are arable land, surface water from one major and several minor springs, and ephemeral pasture (contingent on sufficient rain). The key resource relevant to the commons dilemma faced by the community is irrigation water (common-pool). Hard public infrastructure includes irrigation canals and individual plots of irrigable land comprise the system's hard private infrastructure. Resource users include both the small community of agriculturalists, pastoralists, and their livestock. 'Public infrastructure providers' consist of the small community of agriculturalists and pastoralists.

### 1.1 The Commons Dilemma

The relationship between population and resources in Nayband appears never to have been well balanced. Their water supply is reliable and a haven for travelers, but not sufficient for the irrigation need of the community, and such cultivable soil as they have is reclaimed by terracing or bands from the bed of the wadis which encircle the rock on which the settlement is perched. It is poor soil, and the wheat it does produce is poor quality. Much of the land is given over to the production of alfalfa, and agriculture as a whole is seen more as method of increasing the available feed for their animals than as a reliable harvest for human

consumptions since they are always reduced to seeking a major part of their grain needs from outside markets, and their relationship with the regional governor was particularly important to them in this regard. The households in the village might be characterized as sedentary pastoralists. The pastoral emphasis in their subsistence activities does not lead them to adapt nomadically to their habitat because of the limited and geographically circumscribed nature of the available water resources. Their pastoralism, however, supported by their agriculture, was still insufficient or at least not reliable enough, to afford the adequate subsistence.

## **1.2 Biophysical Context (IAD)**

### **1.2.1 Natural infrastructure (NI):**

The main source of water for irrigation is a major spring and some minor springs. There is no additional information or data regarding the biophysical context of the case.

### **1.2.2 Hard human-made infrastructure:**

The resource appropriated from Nayband Irrigation is water for irrigation. The irrigation system described here includes channels that deliver water from nearby springs to the farmland in the Nayband village. Hard human made infrastructures include the irrigation channels and individual plots. Individual plots must be dug into the ground so that water can flow into them, constructing a basin for crops to be inundated. Likewise, raised earthen bands (walls) surrounding each plot must be formed to keep water in and demarcate plot boundaries. Every possible square inch is prepared for cultivation by building terraces out from the hillside and up from the wadi bed.

## **1.3 Attributes of the Community (IAD)**

### **1.3.1 Social Infrastructure:**

Most of the kalata depend upon small springs, and are from the point of view of irrigation, entirely, separate from the main village. One of them, however, Zardagh, shares the major spring of the region with Nayband, which is two kilometers away. Water from this spring which accounts for some 90 percent of the cultivation of Nayband and all the cultivation of Zardagh is distributed according to a ten-day cycle.

### **1.3.2 Human Infrastructure:**

The water flow is measured by women of the village and in that way the women has been built a human infrastructure in terms of required skill for measuring the flow based on the predefined shares.

## 1.4 Rules in Use (IAD)

1. Position Rules: 133 families of village tenants and smallholders (not mutually exclusive) of land, water, livestock, and the sub-governor.
2. Boundary Rules: Community members: defined by their residence in the village and the cultivation of lands there. Landlord patrons: defined by ownership of large amounts of land in the village.
3. Choice Rules: Tenants must cultivate and irrigate their tenure and pay rent; Neighbors may engage in neighborly labor reciprocity; Community members may provide/hire labor for those in need, in return for a day's food with meat, Village headman must provide security, the sub-governor remits Nayband's taxes in consideration of its function as a military outpost of his demesne and welcomed the Naybandis individually when they had occasion to visit his court.
4. Aggregation Rules: None. Decentralized private property relations, communitarian social institutions, and hierarchical political-economic structures make crucial decisions independent of group rules/consensus.
5. Scope rules: The flow is divided into shares called fenjan (literally "cup") by the holed-bowl method. There are 85 shares in one day's flow, making 850 altogether in a ten-day cycle.
6. Information Rules: Village headman provide information about the share of water for each farmer.
7. Payoff Rules: One share of water sells for 1,000 rials and the price is said to be rising.

## 1.5 Summary

The relationship between subsistence and the social subsystem in Nayband is complex. Although every member of the community owns shares, the nature of the resources is such that few if any own enough to subsist from agriculture alone. Traditionally they have supplemented their income by catering to the caravan traffic, but since the advent of the motor age, this traffic has disappeared. With reference to the distribution of rainfall and location of the village in a dry region, future development of the village is heavily dependent on the collective action of the Naybandis to improve the quality of their agricultural products or be able to provide food for their animals.

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