

# Barrio San Antonio Irrigation System, Tabaco-Philippines

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## 1 Part I: Static Analysis - Collective action

The San Antonio Irrigation system is made of two systems that actually function independently of one another and are managed differently. The systems are an old system built by local farmers in the thirties and a newly-built concrete dam system constructed in the seventies by the National Irrigation Authority (NIA). Farmers with fields in “gurangan na oma” old riceland area which is downstream are served by the old system irrigation and farmers in others areas are served by the newly built dam system. It should be noted that the places the new system serve were not originally ricelands, some were citrus farms. The action situation during the wet season for the old system comprises 30 farmers tilling a 25-hectare (ha) ricefield and 25 farmers tilling 20 ha in the dry season. This is because the 5ha are still planted to rice. The action situation of the new-built system differed from year to year during the period under study for this case site. In the first crop season of 1977 (dry season), 16 farmers tilled 23 ha and in the wet tilled another 23ha. During the dry season of 1978 irrigated areas was 27ha with 3 ha coming from the old system and irrigated areas in the wet season that year was only 7 ha.

### 1.1 The Commons Dilemma

The resource appropriated is water for ricefield irrigation and the dilemma in this study is poor coordination of appropriation mainly arising from the newly-built system due to poor management and consequently being a the source of dispute over the shared resource. Additionally, the Banadero River was the main source that delivers water into the systems to irrigate nearby farmlands. San Isidro river further feeds the old irrigation system with water while boring springs near the sites feeds supplemental water into the newly-built system. Unfortunately, the Boring spring that is supposed to be diverted by a culvert toward the main canal of the NIA-built system is diverted by farmers who cultivate about 7 ha of ricelands near the system’s dam.

### 1.2 Biophysical Context (IAD)

- Natural infrastructure
  - These include cropland areas, forest, rivers, springs and volcano mountains.

- Hard human-made infrastructure
  - For the Old system hard human-made infrastructure include the following i) Grouted stone riprap, ii) 12 meters of the close to the dam is lined with stone riprap, the rest is earthen, iii) 8 take-off and an average of four farmers of the 30 in the action situation drawing water from one take off point each.
  - For the newly-built NIA system which is concrete including the headgate, hard human-made infrastructure includes the following i) 10 meters long boxed culvert attached to the headgate ii) length of the main canal (main canal is 1.75 kilometers) lined with a thin layer of grouted stone riprap. These riprap portions are not continuous but alternate between the earthen or unlined parts. iii) 16 take-off points, 4 are concrete iv) bench flume-cum-siphon, two siphon, an overhead flume and five checks and on check drop.

### 1.3 Attributes of the Community (IAD)

- Social Infrastructure
  - There are 6 formal organizations in San Antonio namely, the Barrio Council, the Parish council, the Parents Teachers Association, the Kabataang Barangay, the Samahang Nasyon, and the San Antonio Farmers Irrigators' Association (SAFIA).
  - Under the leadership of members of the Barrio council, the community successfully ousted from office the captain of the barrio who malversed some barrio funds intended for barrio improvement projects.
  - Under the the guidance of a group of community organizers (COs), residents were involved in a court case against the Tabaco Water District's Office (TAWAD) regarding increased rates for domestic use of water.
- Human Infrastructure
  - The SAFIA had a watertender who used his own intuition to determine water distribution. He had no farmer irrigation training prior to the job.

### 1.4 Rules in Use (IAD)

Position Rules:

- Community Organisers (COs) were young single men and women who are in their twenties.
- SAFIA officials (president, vice president, secretary-treasure, and three board members) are selected via elections.
- Watertender who is hired by the SAFIA.
- Farmers have individual that cultivate ricelands.

Boundary Rules:

- Membership in the association (SAFIA), according to the NIA bylaws was limited only to farmers whose lands were part of areas the newly-built system would service
- Theoretically farmers with fields in the old ricelands could not be members of the association.
- Members were required to pay association dues of 10 Philippine Peso.
- Members were also required to pay an irrigation fee of 1 cavan per hectare per harvest.
- Old system was managed by farmers who have not yet organized themselves.
- Newly-built system was managed by SAFIA officials in conjunction with NIA.

#### Choice Rules:

- Association leadership were to collect membership and irrigation fees as well as fine and penalties.
- Watertender who determined water distribution criteria.

#### Aggregation Rules:

- In the old system, there were 8 take off and an average of 4 farmers of 30 in the action situation draw water from one take off point.
- In old system, during the dry season, downstream farmers have to request up stream farmers to share water. This is often granted but it requires downstream farmers to watch over the flow.
- In the newly-built system the watertender distributed water based on the area served by a take-off point and the age of the ricefields.

#### Scope rules:

- The farmers claim that the water level at the upstream portion of the Banadero River, or at the area close to the dam of the NIA-built system is almost always lower than the water level at the downstream portion of the river, or at the area close to the dam of the old system.
- The water supply in the old dam system is supplemented by numerous springs which are found in that area. When compared the water diverted by the newly-built day is smaller in volume.

#### Information rules:

- Not specified in the original document. However, it can be inferred that appropriators could directly speak to each other to make their request.

- NIA officials give farmers information about rules governing NIA irrigators associations.

Payoff Rules:

- By engaging in Ricefield farming or furniture making resident earn income.
- There were fines and penalties associated with violation of SAFIA rules and regulation although never implemented.

## 1.5 Summary

The original document indicated that there was distrust between the farmers and the local provincial and regional NIA offices. The distrust originated from the very beginning of the process to construct the new dam system. The dispute between these two entities after the construction was focused on the turnover of the management of the NIA-built system to the farmers.

This case can be deemed as unsuccessful.

## 2 Part II. Dynamic Analysis - Robustness

In this system there are appropriators who are consistently disadvantaged. Farmers were gradually observed to leave rice farming because of big loss experience in previous seasons. When a 6am to 6pm shift system was introduced to managed the water distribution, by the second day the system was discontinued because one of the upstream farmers diverted water on the second night. Eventually the water distribution was entirely in the hands of the farmers themselves, particularly the upstream farmers. Their advantageous position led them to get the most of the available water. Consequently downstream farmers in the new built system lost all their crop. Also, fees including fines and penalties fees were not been paid and it appeared there were no systems to monitor and penalize defaulters.

## 3 Contributors

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