

# Sananeri Tank

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## 1 Part I : Static Analysis – Collective Action

The case of the Sananeri tank is part of the original CPR database developed in the 1980s by Edella Schlager and Shui Yan Tang at Indiana University. It is currently available in CSID's SES-library <https://seslibrary.asu.edu/seslibrary/case/60/view>. It was cited from Ruth S. Meinzen-Dick's master thesis titled (1984) "Local Management of Tank Irrigation in South India: Organization and Operation" (Cornell Studies in Irrigation No. 3. Ithaca, NY: Cornell University).

Tanks are small-scale irrigation systems used in several areas of Asia for surface storage and wells tapping groundwater storage. They are the predominant form of irrigation systems in southern India. In 1982 Meinzen-Dick collected field study data from the Ayacut Association of the Sananeri tank located at Tirunelyeili District, southern Tamil Nadu, India, and introduced how the local bodies mobilized local resources for use in a wide range of irrigation-related tasks.

### 1.1 The Commons Dilemma

The commons dilemma of the Sananeri tank includes facility provision at the tank level and water appropriation at the block level. This tank is co-managed by a government agency and a group of cultivators. The former is responsible for tank O&M and water distribution from river to tank; the latter are responsible for terminal maintenance and water distribution within the block of fields, resolving cultivators' conflicts over irrigation, and interacting with the government agency about the demands of tank maintenance. However, due to the limited function provided by the agency, it is the cultivators who must find ways to enforce effective management.

### 1.2 Biophysical Context (IAD)

The Sananeri tank is the third and last tank in a chain totally dependent on water diverted by the anicut (or dam) through channels. It is designed with a water spread of 39 hectares, a capacity of 402,400 cubic meters, 134 irrigated areas and 3 sluices; it has a fixed official ayacut boundary (irrigation area). Due to long periods of irrigation (about 5-8 months per year), a shortage of surface water every cultivator makes heavy demands on tank water, the only alternative is to use the more expensive ground water for irrigation through private wells.

In 1978 the Public Works Department (PWD) built the Sananeri tank with flat stones and mortar. The tank sits in the middle of the interconnected irrigation system. To the west it connects with the anicut diversion facility through channels. The water flows across the tank from the northern to the southern side. To the east it adjoins three more tanks and provides surplus water through weirs. This complex structure requires extensive maintenance techniques making it difficult for the cultivators to repair it themselves and therefore they have to petition the PWD.

### 1.3 Attributes of the Community (IAD)

Human-infrastructure

- Public infrastructure providers: PWD maintains the tank after it is inspected by an engineer (which occurs once every three years). If there is an issue, the president of the Sananeri Ayacut Association can bring it to the attention of the engineer, and then the PWD will bid the reparation work out to a private contractor. The association is responsible for all maintenance

and water allocation below tank.

- Resource users: with free use of irrigation water, cultivators not only plant pisanam crop from October through December, and a second crop of paddy from June to September, but they can plant bush crops, vegetables and fruits etc. Their living depends heavily on tank water.
- Human-capital: the president of the association gains valuable experience through interacting with the PWD. Such opportunities help irrigators learn more techniques for dealing with water distribution and conflict resolution.

Social capital

- Maintaining good relations between the PWD and the association: the association president approaches a PWD engineer to make a personal request and submits a written petition along with some tea and a light snack as a courtesy for his service. This approach ensures that the engineer will be responsive to the cultivators' needs.
- Existing trust among the cultivators: because of the decline of kudimaramat (village institution) customs due to an increase in social heterogeneity (seven castes and three religious groupings), cultivators' trust in association managers' personal integrity promotes the effectiveness of the Sananeri Ayacut Association's tank management.

#### **1.4 Rules in Use (IAD)**

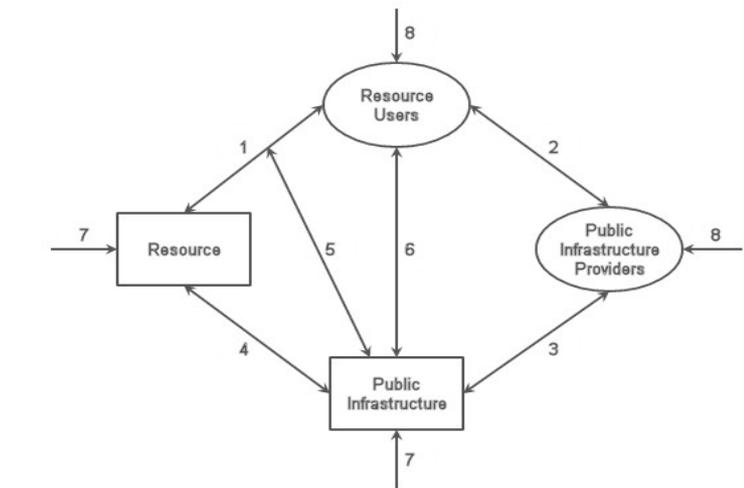
- Boundary rules: all cultivators in the Sananeri Tank Ayacut have the right to use water and they are also members of the association.
- Position rules: the association selects a core committee of 17 elders, out of which it selects a president and a secretary for contact with the PWD. The association also elects 2 neeranis and 6 neerpachis for water management below the tank level.
- Scope rules: the neerani is responsible for the tank water, patrolling the weir and opening the sluices; the neerpachi is only responsible for delivering water from the sluice to the fields.
- Choice rules: rotation irrigation initiates at the field level when water flows are low and organization or cooperation among cultivators is needed for distribution to be accomplished.
- Information rules: there is no written information about water use, but there is an unofficial sanction rule that cultivators will recall a manager who misuses his power.
- Payoff rules: in summary, the cultivators' expenses take up 5% of the total benefits from irrigation, including fees for the neeranis and neerpachi, cash contributions to the tank fund, labor for channel cleaning, locally-mobilized contributions and component of land revenue due to irrigation. As a result, cultivators are more willing to use tank water.
- Aggregation rules: water use requires ownership of ayacut land plus an annual payment to the government and to the ayacut association.

#### **1.5 Summary**

The Sananeri Ayacut Association's success in tank management can be attributed to elements such as a moderate shortage of water, effective sanctions, higher benefits relative to cost, trust among cultivators, and trust between the PWD and the association.

However, currently the Sananeri tank is suffering some disturbance as a result of the tank modernization project funded by the EU since 1997. Its effectiveness in water supply is decreasing, according to Meizen-Dick's recently revisited research.

## 2 Part II : Dynamic Analysis – Robustness



- Resource: water for irrigation
  - Resource users: cultivators using water for irrigated crops
  - Public infrastructure providers: A government agency, the Public Works Department (PWD) responsible for tank O&M; and Sananeri Ayacut Association responsible for terminal O&M
  - Public infrastructure: The Sananeri tank made of flat stones and mortar; a set of formal document stipulating tank O&M division between the PWD and cultivators; a set of informal rules identifying cultivators' water distribution and appropriation
- ◇ Link 1: Tank water is the first choice for cultivators to use and well water is the supplement. When there is not enough tank water for the whole ayacut, cultivators turn to well irrigation.
  - ◇ Link 2: The Sananeri Ayacut Association is organized by the cultivators themselves based on their trust in each other. The association president offers a courtesy gift for the PWD engineers to encourage them to respond to cultivators' needs timely.
  - ◇ Link 3: The under provision of the Sananeri tank repairs by the PWD (once every three years) urges the association president to petition its engineers for more service.
  - ◇ Link 4: Good tank maintenance keeps the maximal water storage level.
  - ◇ Link 5: Good tank maintenance provides a stable water supply for the cultivators. The detecting rule enforced by the association water guards keeps the cultivators from having water conflicts.
  - ◇ Link 6: Through the association, cultivators participate in crafting rules and enforcing them. Cultivators need pay tank O&M cost, which motivates them to concern the tank.
  - ◇ Link 7
    - \* To resource: The monsoon climate produces uncertain water level in the river, which causes inadequate water supply for the Sananeri tank.
    - \* To public infrastructure: The silt deposition reduces the tank water storage volume.
  - ◇ Link 8
    - \* To public infrastructure providers: The upcoming end of the president's tenure forces the association to face lack of experienced leader who can provide good and active service.
    - \* To resource users: The well subsidy policy could motivate more cultivators to construct wells, which will cause them less willing to pay for tank O&M.

(English editor: Jennifer Fraser)