

# Kottapalle Open-field Husbandry and Irrigation

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## 1 Part I: System Structure - Collective action

The village of Kottapalle is located in the state of Andhra Pradesh in an area of upland southern India that is wedged between a coastal plain that traces the perimeter of the southern Indian peninsula and its inland mountain ranges. The original case study covers an unknown time period prior to 1988, and catalogues an action situation involving approximately 3,100 villagers organized in 575 households who depend on the produce of the village land. The state irrigation department is responsible for regulating water allocation between villages and outlets from the canal. The local council is responsible for distribution of the canal water to village fields. Manure is obtained for the fields, by allowing sheep and goats to come into the village for the period from the harvest until the time of field preparation for the next season. The resource system (natural infrastructure) is the watershed and topography and the key shared resource is irrigation water and grazing land.

This case study is part of the original Common-Pool Resource (CPR) database. A summary of the original CPR coding conducted in the 1980s by Edella Schlager and Shui Yan Tang at Indiana University may be found [here](#).

### 1.1 The Commons Dilemma

- Potential over appropriation / poor coordination of appropriation: : There are two social dilemmas in this system:
  - In practice, farmers themselves intervene in water distribution - illegally - to improve their own group or individual supply. The consequence of such intervention in upstream villages is that Kottapalle experiences a scarcer and more unreliable water supply than others.
  - Straying animals pose a major risk to fields with standing crops that usually surround fallow fields. This results in very heated quarrels.
- Potential under provision of public infrastructure: Farmers in the tail-end system are locked into paddy due to water seepage close to the distributary. However, they don't receive sufficient water due to inaccurate estimation of water requirements by the government.

### 1.2 Biophysical Context (IAD)

- **Natural infrastructure:** Located in the Nowk valley in Kurnool district in the state of Andhra Pradesh in South India, Kottapalle has an area of 4,600 acres. About

200 acres are uncultivable, 2,200 acres are irrigated (800 acres with single crop a year and 700 with two irrigated crops), and roughly 3,000 acres are under rainfed crops. Irrigation water is crucial for lands under paddy crops (Wade 1988:72). Annual average rainfall of about 750 mm is concentrated from June to November, 62 percent falling in three months from July to September. Rainfed crops are typically sorghum, millets, grams, groundnut, and cotton. On irrigated lands, preparation of paddy seedbeds begins in late June and early July. In the second (dry) season, typically from December to May, the main irrigated crops are hybrid sorghum, groundnut and paddy, with small areas of turmeric, onions, and cotton.

- **Hard Human-made infrastructure:** Kottapalle's land begins 15 miles down a 20-mile unlined distributary of the MN Canal. By the time the water reaches Kottapalle, the distributary has fed the land of 11 villages. Only one more village below Kottapalle draws water from it. The village council constructed a new community-owned structure where sick animals could be treated.

### 1.3 Attributes of the Community (IAD)

- **Social Infrastructure:** Caste and gender play a strong role in inhibiting the development of a "natural" collectivism in the village, as does the hiring of labor for agriculture (instead of cooperative help through labor exchanges). Activities like the sheep-folding auction and council meetings foster a sense of connectedness and augment social relationships.
- **Human Infrastructure:** Almost all of the male labour force are engaged in agriculture as cultivators or labourers or both. The 15 percent of non-agriculturalists include men whose primary occupation is potter, washerman, barber, or trader; and ten or so government employees, such as Irrigation Department field staff, postmaster, postman, primary school teachers, and veterinary assistant. A handful of men commute to jobs or businesses in Nowk.

### 1.4 Rules in Use (IAD)

#### 1. Position Rules:

- Village Council:
  - A core committee of 9 members plus the village accountant is elected to manage ongoing business in the village.
  - Of the nominated members, 8 belong to an upper caste and 1 belongs to a lower caste.
- Villagers: 4 Field Guards, and 12-13 Common Irrigators, farmers, and herders.
- Irrigation staff (Supervisor of the V Distributary, Executive Engineer, Assistant Engineers, Local village contractor)
- Field staff (two channel men and one foreman)

#### 2. Boundary Rules:

- All residents of Kottapalle village, except women, are eligible to attend the general body meetings.

- Outside herdsmen obtain exclusive access rights to graze and fold sheep in the field of successful auction bidders.

### 3. Choice Rules:

- Village Council
  - The council must appoint a squad of field guards for most of the year, and must employ extra guards whenever required.
  - The council must decide the fine in cases of large straying cattle.
  - The council must organize an auction (sheep folding) to address the problem of allocating flocks to farmers.
  - The village council must appoint common irrigators each year depending on water supply conditions and decide the daily wage rate.
  - The village council must appoint two village elders who allocate particular outlets to the common irrigators.
  - The village council must also be involved in bringing more water to the village and in resolving conflicts over water within the village.
  - The council must settle cases of alleged crop theft and water disputes which infringe on common irrigators' authority.
  - The council must administer and keep records of village fund expenditures and present these accounts (orally) to the general meeting.
- Farmers:
  - All farmers must follow the date for planting sorghum the council fixes to minimize patchwork harvesting and crop theft.
  - When groundnut is being harvested, the owner or tenant must be present in the field to supervise the gang of harvesters to prevent crop theft.
  - Farmers must keep the livestock within the village boundaries.
  - If a farmer pays the fund or the herder in kind rather than cash, he must make the conversion at the rate decided by the council.
  - Farmers must send men to help the shepherd guard the livestock at night, at the rate of two men per 2,000 head.
  - Farmers must self-organize and maintain their field channels.
- Herders:
  - Herders must take their flock to the designated field by 6:30 PM and keep it there until 8 AM.
  - They must not allow the flock to graze standing crops.
  - Shepherds must graze their flock for four nights in the designated field. By failing to do so, they will receive only half of their share from the auction.
- Common Irrigators
  - They must distribute water between the paddy fields, and bring more water down the distributary to the village.
  - They must prevent irrigators up the distributary line from Kottapalle's boundary from blocking Kottapalle's branch.
  - They must help the field guards protect crops from theft during harvest time.

- They must improve water supplies to the tail-ends by instituting a rotational irrigation schedule.
- If a common irrigator is sick and unable to work, he will have to send a replacement.
- They may refuse to deliver water down an ill-kept field channel.
- Contractor:
  - He must negotiate with the Irrigation Department engineers on the payment (bribe) for assured supplies in the first season.

#### 4. Aggregation Rules:

- All villagers assemble in the meeting area outside the accountant's house to participate in the sheep auction.
- Vigilance of water levels in the fields and distribution network, and of the activities of other irrigators, is done by the farmers themselves in ad hoc arrangements.

#### 5. Payoffs Rules:

- Owners of straying livestock pay a fine of Rs. 4 per head at night and Rs. 2 per head during the day to the field guards.
- The field guards retain all the money they collect from small fines. They keep 25 per cent of the bigger fines, decided by the council, and are responsible for collection. The field guards are also paid from the village fund.
- Half of the revenue generated in the auction goes to the owner of the flock, and other half to the village fund. The village fund is used to pay for the hospitality of the engineers when they visit the village.
- A single payment in grain is made to the common irrigators after the crop is harvested.
- The whole village contributes to the amount paid to the Supervisor or Assistant Engineer for assured water supplies in the first season. In addition to the bribe money, the village also gives grain to these officials and the field staff.
- Farmers who collect water out of their turn must pay a fine of Rs. 20 to Rs. 30.

#### 6. Scope Rules:

- The job of common irrigators is less regulatory if they are appointed post seed transplantation, compared to water allocation responsibilities during seed transplantation.
- The village council does not have the kind of judicial role which is thought to have been a normal function of the 'Indian village panchayat'. It enters disputes only where its own authority or that of its agents is infringed.

#### 7. Information Rules:

- During the time of drought, tail-end farmers hear from the common irrigators at the fork two miles up about the flows reaching that point, based on which they calculate when their crops might begin to suffer.
- The village crier announces details of upcoming meetings, festivals, common irrigator elections, and any other decisions made by the village council.

## 1.5 Summary

The Kottapalle village council is engaged in providing public goods, in the sense that if they are provided to one, they must be provided to many. These include not only field guarding, but also such quantitatively unimportant but sociologically significant services as employment of a specialist monkey catcher, or of well repairers. The benefits provided by the council and fund, and the means of raising income to provide them, are also 'organizational goods', in the sense that people must organize to get the collective benefit. The payoff to such organization can be high, as seen in the case of field guards and common irrigators. However, the village council is not necessarily a robust collective approach to managing common property. This is in part due to the fact that many view the council as a mutual interest association that is replaced once their interests are no longer served by the council. Furthermore, the village council is not acknowledged as an institution by the Indian government. These two factors may lead to future fragilities that undermine the council's effectiveness in regulating the commons.

## 2 Part II. Dynamic Analysis - Robustness

Given the source document, there is insufficient data to make any assessment on the temporal dynamics (resource and social conditions, etc.) of this particular common-pool resource. The contributors thus far have been unable to locate any specific updates for this case study.

## 3 Case Contributors

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