

# Watershed Management in Silalaeng, Northern Thailand (1)

July 21, 2015

## 1 Part I: Static Analysis - Collective action

Silalaeng is located in Nan province in northern Thailand. The population is supported mainly by wet-rice agriculture with the water supply dependent upon the forested headwaters, which are over 1000 m in height (p. 680).

The key resources are timber and fuelwood from the community-managed forests. Silalaeng is seen as a robust community because it substantially meets all the seven design principles, and the community members themselves are also confident about the future of their institutions (p. 688). And relative resource scarcity, which reflects the subjective opinions of the villagers and the field experiences of the researchers, is moderate in Silalaeng (p. 678).

The original CPR report may be found at <https://seslibrary.asu.edu/seslibrary/case/155/cpr>. Coupled Infrastructure Systems framework is explained in more detail in Anderies (2014) <http://link.springer.com/article/10.1007/s11538-014-0030-z>

### 1.1 The Commons Dilemma

- The potential appropriation problem / poor coordination of appropriation

The potential over appropriation problem was overcome in Silalaeng. The rules clearly state the rights and duties of the members of the community as well as the authority and liability of the Tambon Council as a decision making body. Silalaeng controls the rate of appropriation by the quota of trees that can be cut per month for each village and allows only fallen trees to be used as firewood (p. 685). The Tambon Council is comprised of the tambon leader as Chairman, every village headman in Tambon Silalaeng, a highly respected elder elected for a 5-year term from each village, the tambon doctor, a secretary selected from the elementary school teachers, and an adviser appointed by the district officer. The structure makes for stronger unity in decision making, and the watershed activities fit within the overall regular program of the Tambon Council. Regular patrols are a distinctive feature of Silalaeng. Duties circulate among the villagers. When on patrol, monitors get paid and are also covered by insurance for injury or loss of life. The resource protection element of the watershed management rules is clearly stringent (pp. 681-2).

- The potential under provision of public infrastructure

The potential under provision problem was overcome in Silalaeng. According to Anderson et al. (2004), public infrastructure combines two forms of human-made capital: physical capital including any engineered works, such as dikes, irrigation canals, etc; and social capital including the rules actually used by those governing, managing, and using the system and those factors that reduce the transaction costs associated with the monitoring and enforcement of these rules. In terms of physical capital, villagers mark the boundary with concrete poles to overcome more or less unclear topographic demarcation of the community forest (p. 685). With regard to social capital, villagers allowed to cut trees must plant five trees for every one tree cut. Each village headman has to submit three persons from his village to be the monitors in the Forest Patrol Committee and is responsible for any change in these representatives (p. 681). The Forest Patrol Committee is on duty twice a month or more. 72.1 percent of entire households participate in decision-making process, and 51.2 percent take part in formal monitoring (p. 686).

## 1.2 Biophysical Context (IAD)

- **Natural infrastructure**

Northern Thailand is an area of steep, north-south-running mountain ranges up to 2500 m in altitude, separated by often fairly broad alluvial valleys (p. 676). Watershed forest in Silalaeng is 9700 ha, and the proximity of villages to watershed is 1-2 km. The scarcity of forest resources is moderate (p. 678). In Silalaeng, the topographic demarcation of the community forest is not pronounced. However, this is compensated for by the villagers marking the boundary with concrete poles. The watershed is close to the community, and all roads into the watershed must pass through the community and can hence be easily monitored (p. 685).

- **Hard human-made infrastructure**

There is no explicit information about hard human-made infrastructure such as roads and fields of seedlings.

## 1.3 Attributes of the Community (IAD)

- **Social Infrastructure**

In Silalaeng there are 10 villages, 1231 households, 6291 people, and 9700 ha watershed forest (p. 678). Most of the population are northern Thai, but there are also 3 villages of hill-tribe peoples. In terms of the web of relationships among agents, the Tambon Council plays a role as public infrastructure provider; and it is comprised of the tambon leader as Chairman, every village headman in Tambon Silalaeng, a highly respected elder elected for a 5-year term from each village, the tambon doctor, a secretary selected from the elementary school teachers, and an adviser appointed by the district officer. The structure makes for stronger unity in decision making, and the watershed activities fit within the overall regular program of the Tambon Council (p. 681). All households in the tambon have the right to use the community forest (p. 685).

- **Human Infrastructure**

Most respondents (79.1 percent) consider the watersheds as community property resources in which all members of the community share equal rights and duties, rather than the legally correct answer of state property. Almost all households knew about the existence of the watershed operational rule results (p. 683). 88.4 percent of respondents in Silalaeng accepted their rules-in-use (p. 684).

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

##### **Position Rules**

- Tambon Council: The Tambon Council as an administrative community is responsible for forest protection. The Tambon Council is comprised of the tambon leader as Chairman, every village headman in Tambon Silalaeng, a highly respected elder elected for a 5-year term from each village, the tambon doctor, a secretary selected from the elementary school teachers, and an adviser appointed by the district officer (p. 681).
- Monitors: Each village headman has to submit three persons from his village to be the monitors in the Forest Patrol Committee and is responsible for any change in these representatives (p. 681).

##### **Boundary Rules**

- Resource boundary: In Silalaeng, the topographic demarcation of the community forest is not pronounced. However, this is compensated for by the villagers marking the boundary with concrete poles (p. 685).
- Resource users boundary: All households in the tambon have the right to use the area, and most are quite familiar with it and each other, due to their communal monitoring activities (p. 685).

##### **Choice Rules**

- The Chairman of the Tambon Council: He (or she) has the duty to coordinate with other Tambon, with the Forest Patrol Committee, and with the government officials involved in forest protection (p. 681).
- The Tambon Council: The Tambon Council as an administrative body is responsible for forest protection. In the case of loss of life while on duty, the council will compensate the family with the amount of 10,000 baht. The council can approve the request of villagers who want to collect fuelwood and make charcoal. The council can take legal action if resource users violate the regulation of forest appropriation (e.g. illegal logging) (p. 681).
- Monitors: The Forest Patrol Committee is on duty twice a month or more (p. 681).
- Resource users: Every member of the community has the right to request for appropriation of the forest for building a house. The villagers may take a request through the village headman, who will bring it up for approval at the meeting of the Tambon Council. Request for appropriation of the forest for house building is limited to only three logs for one village a month. Villagers allowed to cut trees must replant five trees for every one tree cut (p. 681).

##### **Aggregation Rules**

In Silalaeng, due to the size of the community, direct participation is only slightly higher, with rule-making tasks left to the Tambon Council. However, the villagers in Silalaeng seem happier about their abilities to have inputs to decisions through their representatives. In

addition, villagers also have the opportunity to participate in the Forest Patrol Committee, where responsibilities rotate among the community (p. 686).

### **Scope rules**

- There are no mentions about scope rules.

### **Information Rules**

- Villagers who give information about the violation of rules that leads to seizure of logs will be awarded half of the value of the confiscated property (p. 681).

### **Payoff Rules**

- Benefits: When on patrol, monitors get paid and are also covered by insurance for injury or loss of life (p. 682). Villagers who give information about the violation of rules that leads to seizure of logs will be awarded half of the value of the confiscated property (p. 681). One third of the revenue from the fines goes to the Tambon Council for public spending and the rest is awarded to the Forest Patrol Committee (p. 681).

- Costs: Should any village not cooperate and not comply with this regulation (concerning forest patrol), the possible penalties are as follows: warning and more contributions next time, fine for 100 baht/person/day, forfeit the rights to use the forest. Penalties for violating the regulation of forest appropriation as follows: be fined 1,500 baht for each tree cut, or failure to comply with the fine, the Tambon Council will take legal action (p. 681).

## **1.5 Summary**

### **Resource**

The key resources are timber and fuelwood from the community-managed forests. Silalaeng is seen as a robust community because it substantially meets all the seven design principles, and the community members themselves are also confident about the future of their institutions (p. 688). And relative resource scarcity, which reflects the subjective opinions of the villagers and the field experiences of the researchers, is moderate in Silalaeng (p. 678).

### **Resource users**

All households in the tambon have the right to use the area, and most are quite familiar with it and each other, due to their communal monitoring activities (p. 685). Every member of the community has the right to request for appropriation of the forest for building a house. The villagers may take a request through the village headman, who will bring it up for approval at the meeting of the Tambon Council. Request for appropriation of the forest for house building is limited to only three logs for one village a month. Villagers allowed to cut trees must replant five trees for every one tree cut (p. 681)

### **Public infrastructure providers**

1) The Tambon Council: The Tambon Council as an administrative body is responsible for forest protection. In the case of loss of life while on duty, the council will compensate the family with the amount of 10,000 baht. The council can approve the request of villagers who want to collect fuelwood and make charcoal. The council can take legal action if resource users violate the regulation of forest appropriation (e.g. illegal logging) (p. 681). The Chairman of the Tambon Council has the duty to coordinate with other Tambon, with

the Forest Patrol Committee, and with the government officials involved in forest protection (p. 681).

2) Monitors: Villagers also have the opportunity to participate in the Forest Patrol Committee, where responsibilities rotate among the community (p. 686). The Forest Patrol Committee is on duty twice a month or more (p. 681). When on patrol, monitors get paid and are also covered by insurance for injury or loss of life (p. 682).

### **Public infrastructure**

1) Natural infrastructure: Watershed forest in Silalaeng is 9700 ha, and the proximity of villages to watershed is 1-2 km. The scarcity of forest resources is moderate (p. 678). In Silalaeng, the topographic demarcation of the community forest is not pronounced. However, this is compensated for by the villagers marking the boundary with concrete poles. The watershed is close to the community, and all roads into the watershed must pass through the community and can hence be easily monitored (p. 685).

2) Hard human-made public infrastructure: There is no explicit information about hard human-made infrastructure such as roads and fields of seedlings.

3) Soft human-made public infrastructure: See 1.4 Rules in use (IAD)

## **2 Part II. Dynamic Analysis - Robustness**

This update to Watershed Management in Silalaeng case was made in 2015 by Hoon C. Shin at Arizona State University. In-text parenthesis indicate corresponding links in the system representation (Robustness diagram) on the SES library.

### **2.1 Update on the Commons Dilemma**

### **2.2 Shocks, Capacities, Vulnerabilities**

The authors do not provide enough information for dynamic analysis. But they introduce an important legislation that can affect social-ecological system in the near future as follows: A robust institution can soon be weakened in the face of users discarding their obligations for reciprocity. Similarly, institutions that may now be considered fragile can become more robust if they strengthen their weaknesses. The new draft bill on the establishment of legal forest communities that is now under consideration would, if adopted, require forest community committees, forest community officials, and provincial forest inspection committees chaired by the provincial governor. While in some cases this may lead to the strengthening of some weaker local institutions, stronger ones, such as Ban Pae and Silalaeng, may in fact be weakened by this regimentation and apparent greater degree of reliance on outside authorities. Sensitivities to the local situation will be required to maximize the benefits brought about by the legislation without detracting from the benefits that can be gained through local self-determination (p. 689).