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## **Community actions against anticommons of forests in contemporary Japan: Case studies of former common forests**

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# **Community actions against anticommons of forests in contemporary Japan: Case studies of former commons forests**

Over the past few decades, many Japanese forest owners and communities have suffered from the outcomes of anticommons (parcelization) phenomenon. Since the Edo Era (17th through 19th centuries), many Japanese commons forests have been subdivided and placed under private ownership. Individual owners of the subdivided small forests (carved out from former commons forests) have lost interest in forestry, resulting in unclear borders. Many owners have relocated outside the villages (absent owners) and/or have passed the land down through generations, resulting in unknown ownership. There are several ways to ameliorate the anticommons phenomenon in Japan, as illustrated by these examples. 1) Despite the expense, a residents' association successfully re-appropriated co-ownership land by "technically" suing the current respective co-owners. 2) Some residents' associations collectively manage subdivided forests as one unit to reduce the damage caused by animals such as wild boars or deer. However, the units are still legally separate and owned by individuals. 3) A land owners' association stipulated that a vacating resident owner must sell her forest to the remaining residents. These three cases show how motivations, other than profits, could help address the anticommons phenomenon. These motivations include the intent to keep the community's holding intact in the event of consolidation at the municipality level, to protect the land against pest animals, and to keep the community's drinking water pure.

Keywords: anticommons; parcelization; absent owners; residents' association; Japan

## **Introduction**

### ***Background***

Small holding sizes of Japan's individual forests present huge anticommons (Heller 1998; Heller 2008) challenges for management and utilization of forests' ecosystem services in Japan. In fact, 0.1 to 1 ha holdings constitute 58% in terms of numbers (10%

in terms of areas) of all individual forest holdings in Shiga Prefecture, Japan, a study site in this paper, as of 1990 (Statistics Bureau, 1993) (Fig. 1). Such holding patterns have their roots in the history of the common forests in Japan.

(Insert Figure 1 near here)

In Japan, historical division of common forests among commoners started in the early modern era (the 17th to 19th centuries) of Japan. It is often said that the infiltration of the market economy into agricultural villages, which had been based on self-sufficient economies, promoted this process. During the 19th and 20th centuries, as the industrialization of Japanese society went on, the owners of those subdivided forests (parcelization) stopped using forests for traditional purposes (fodder, fertilizer, and fuel, etc.) because they replaced wood harvested from their forests with other industrial products such as compound feed, chemical fertilizers, and fossil fuel. Increasing demand for construction wood encouraged the owners of subdivided forests to plant seedlings of relatively fast-growing softwood species such as Japanese cedar (*Cryptomeria japonica*) and Japanese cypress (*Chamaecyparis obtusa*). Especially, the recovery and high economic growth that followed World War II in Japan resulted in high timber prices and encouraged active tree planting by individual forest owners while forests in Japan, which had been over-harvested during the war, could not respond to the demand sufficiently at this period. In turn, the high timber prices motivated policy makers to liberalize wood imports in this period, and the increasing wood imports resulted in competitive pressure on the domestic wood market and decreasing profitability of forest management in Japan. Consequently, forest owners have been losing interest in forest management and ownership. In addition, the new civil code of

Japan following World War II orders property owners, in principle, to bequeath forests to their sons and daughters equally, while the pre-war civil code included the traditional concept of family assets, which were supposed to be inherited by a series of family chiefs. This new inheritance practice further encouraged parcelisation of individual forests.

Recent depopulation in Japan had already started in rural areas, especially in mountainous regions of Japan in the 1960s. In many cases, legal owners of forests in rural areas now live in areas far from their forests (absent owners). Since the borders of forests owned by individual owners have often not been clearly recorded and tampering with neighbouring forests without proper permission is illegal, on-site inspection by related owners is necessary for managing forests. In addition to the low interest of forest owners in their forests and high transaction costs such as on-site inspection, small sizes of individual forest ownership hinder utilization of forests. Currently, many forest operators are pursuing low-cost operations, employing machines such as harvesters and processors, which are expensive, while high-volume operation is needed. Small-size forest ownership makes the establishment of economies of scale difficult in many cases.

Policy responses by the Japanese government include the promotion of the assembly of forest operations by forest operators such as forestry cooperatives or forestry companies. Forest operators assemble individual forests for the purpose of forest management, while individual ownership forests remain as they are. However, unclear borders among individual ownership properties or low interest of owners could again hinder such assembly. Especially, co-ownership with many co-owners and small individual ownership properties, which were often former common forests in the Japanese *iriai* system, present tough challenges to the policy makers and forest operators who are promoting and practicing assembly of individual forests.

### *Structure of this paper*

In this study, we interpret these challenges as anticommons problems (Heller 1998; 2008) and describe three cases in which communities have resolved these problems themselves in a bottom-up manner (Fig. 2) while we here do not deal with policy-driven official assembly by forest operators mentioned in the above. The second “Materials and Method” section presents research methods we employed. The third “Results” section describes three cases in detail. The fourth “Discussion” discusses about the findings from the cases and speculating about future development in this line of research.

(Insert Figure 2 near here)

### **Materials and Methods**

We selected three cases in which communities resolved anticommons situations themselves, in Shiga Prefecture, Japan. Shiga Prefecture is one of 47 prefectures in Japan and has about 1% of the total area and population of Japan. Close to large cities such as Kyoto, Osaka, and Kobe, Shiga Prefecture has a significant manufacturing sector but maintains traditional agricultural landscapes (Fig. 3). Shiga Prefecture includes the largest lake in Japan, Lake Biwa, and the prefectural government places much emphasis on environmental protection. We interpret the following to be case studies conducted in areas where historical subdivision is well advanced, given that the Kyoto, Osaka, and Shiga region is considered to have been economically advanced in the early modern era of Japan from the 17<sup>th</sup> through 19<sup>th</sup> century. From 2015 through 2019, we collected documents/statistical data and interviewed the main players in the communities with respect to the initiatives.

(Insert Figure 3 near here)

## Results

### *Formal transformation of co-ownership into community ownership (Village A)*

First, we present an overview of Village A (Matsushita and Takahashi 2017). This village is a mountain village with an aging population. In the early modern era of Japan, from the 17th to 19th centuries, the village was a post town in a mountainous area connecting areas on the Sea of Japan and the Kyoto-Osaka area. Currently, the population numbers 32, and 19 (59%) of the residents were 75 years or older in 2015 (Statistics Bureau 2017). The size of the village is about 800 ha based on the property tax ledger.<sup>1</sup> and most of the area is covered by forests. A majority of the forests are hardwood forests, which previously produced fuel wood and charcoal raw material. Besides, the prefectural forestry corporation planted softwood trees on 100 ha of the village land under a share-cropping scheme. The corporation returned the plantation forests to the village because the scheme was not as profitable as originally expected.

Formal transformation of co-ownership into community ownership occurred as follows. Diverse titles such as former municipalities and co-ownership were found before the title changes. About 400 ha of forests were registered under the title of the residents' association. The remaining forests were registered under the titles of co-ownership such as "Mr. Tanaka and 10 other people." Titles for about 90 such forest stands were identified. The number of "other people" ranged from 10 to 20. Almost

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<sup>1</sup> Actual figures for the area could be several times greater than those based on the property tax ledger. This type of discrepancy occurs often with forest lands in Japan.

1,000 people who had inherited land claims were found all over Japan. The residents' association sued the 1,000 people so that the village could legally ascertain its rights to those lands from 2004 through 2015. The residents' association sent a letter explaining its intentions, i.e., rectifying legal confusion, to the defendants. A majority of those sued (defendants) accepted the association's claim. Many of the defendants did not even know about the land. In planning and implementing these actions, the leadership of a council member of a municipality, which was amalgamated into the current new municipality, as well as the expertise of an official of the prefectural government, were indispensable. Fund earned as fees from a resort company renting the commons land of Village A also contributed to this initiative.

The community currently has the following ideas regarding future forest management. With respect to hardwood forests, a majority (80%) of the village forests, no specific plan is being considered. With respect to softwood plantation forests (100 ha), thinning every 10 years by forest cooperative workers is being considered, meaning a thinning of 10 ha each year. The village is also pursuing a new use of its forests. The Research Institute for Humanity and Nature (RIHN) began experimentally shifting cultivation in the village's forests, collaborating with the residents' association. On this experimental forest land, turnips are grown and harvested each year. Even though Village A has made a progress in establishing community ownership again, it still has further challenges: Aging and a decreasing population threatens community sustainability.

We summarize the findings from this case as follows:

- It is possible to transform co-ownership titles with many potential claimants to the title of the residents' association through court action.

- A large part of the potential claimants who inherited rights accepted the opinion of the residents' association.
- The scheme of authorized community organizations (*Ninka chien dantai*), a new scheme (1991–) enabling such organizations to own assets, may have encouraged this initiative.

***Informal reintegration for the purpose of reducing damage by wild animals  
(Village B)***

Village B is an agricultural village located on the border between agricultural crop lands, mainly rice paddy fields, and forested hills. Its population is 97, and 14 residents (14% of the population) were 75 years or older in 2015 (Statistics Bureau 2017). The area of the village is 76 ha, and forests cover 52 ha. The ownership consists of individuals' 16 ha, shrine/temples' 3 ha, community district's 20 ha, and co-ownership's 13 ha. The plantation covers 4 ha (mostly Japanese cypress), and natural forests cover the remaining 47 ha (pine (*Pinus densiflora*), 32 ha; hardwood, 15 ha). The remaining 1 ha is an unforested area and bamboo forests.

The informal reintegration of the forests went as follows. The main purpose of forest management is to discourage wild animals such as deer and wild boars from coming out of the forests by practicing active thinning and setting up buffer zones between croplands/residential areas and forests. Thinning of trees of certain sizes requires professional skills and equipment; individual owners must subcontract forest operators to conduct thinning. Since timber revenue itself cannot cover the necessary costs for subcontracting, if a forest owner wishes to receive a forestry subsidy, he/she must prepare a forest management plan with a certain size of forest (2012–). Therefore, members of village B jointly prepared an integrated management plan for individual



forests, as well as shrine/temple, community district, and co-ownership forests in 2012. The Land Improvement District organization<sup>2</sup> employed their expertise in management of agricultural land to prepare the forest management plan. In particular, an officer of the Land Improvement District led the whole process in the village where he lives in the early stages of this initiative. Subsidies from the national, prefectural, and municipal governments, along with timber revenues, covered the cost of thinning. Individual owners agreed that the residents' association would receive a possible profit without resolving the border issues. The village had to resolve border issues only with other villages, not among village members. This is the key to resolving the anticommons situation in this case. A forestry cooperative implemented thinning as a subcontractor.

After the introduction of this initiative, significant thinning activities took place. In 2012, six ha of forests in village B and neighboring villages were thinned. Similar programs were implemented in 70 ha of forests in eight blocks, including 11 villages in the same city from 2012 through 2014. For the purpose of avoiding outsider ownership, buy-back of forests sold to people living in remote areas took place several times.

While diffusion of the practices in Village B among communities in the same municipality has been considered by the forestry cooperative, it is difficult since the owners of plantations with higher value timber are reluctant to go with this type of setup.

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<sup>2</sup> A Land Improvement District is “an agricultural water use organization which has the qualification of a juridical person and implements land improvement projects, operation and maintenance of land improvement facilities and control of irrigation and drainage in compliance with the Land Improvement Law” (Nagata 1985).

Two findings from this case are identified as follows.

- The specific purpose of reducing damage done by wild animals to agriculture induced the reintegration of private forest management.
- Expertise and experience in the management of agricultural lands helped to induce the reintegration.

***Informal reintegration for the purpose of community water source protection  
(Village C)***

Village C is a suburban community close to both a city center and a mountainous area. In the early modern era of Japan, the village was a post town on one of the five major routes of Japan. The village's population is 179, and 18 residents 75 years or older constituted 10% of the total population in 2015 (Statistics Bureau 2017). Watershed forests cover the watershed area for their drinking water, which is provided by the village's small-scale drinking water supply system. The total area of the village is 129 ha, while its watershed forests cover 71 ha. Most of the forests are individually owned forests. Plantation forests cover 14 ha, and natural forests cover 51 ha, while the remaining 5 ha are unforested or covered by bamboo as of March, 2004 according to the forest register. Japanese cedar constitute 9 ha; Japanese cypress, 2 ha; pine, 38 ha; Kunugi oak, 5 ha; and others, 14 ha.

Some years after World War II, fuel wood was not in use anymore. A few owners sold their forests to outsiders. Responding to the situation, the Common Land Association, an organization of former commoners, was established around 1970 by more than 30 members, and the members agreed to refrain from abandoning their forests. The Association planted trees such as Japanese cypress and cedar and bought

back forests sold to outsiders. Committee members manage the forests near the community's water source (less than 10 ha), regardless of who owns them. A charcoal kiln was built, and charcoal has been produced utilizing waste wood harvested during forest management. Waste wood from forest management is also used for bonfire fuel for the village's shrine. A soy sauce company owner has been an active participant in this initiative. The soy sauce company emphasizes the importance of clean water for manufacturing soy sauce. Donations from Association members and voluntary labor contributions from them have supported this initiative. Advice from lawyers in the city and from the metropolitan area was employed throughout these processes.

We summarize two findings from this case.

- The specific purpose of water source protection promoted the informal, ad-hoc reintegration of water source forests.
- A local business that relied on the water source led the active forest management.

## **Discussion**

We compare the above-described three cases in Table 1. We examine the three cases according to eight criteria, i.e., issue, response, new use, finance, labor, driving force, leadership and legal rights.

(Insert Table 1 near here)

Although we identify few similarities among them on the surface, we can draw five lessons from the three cases.

- Under certain favourable conditions, communities can resolve anticommons situations and manage or utilize their resources.
- Initial motivations were benefits other than timber production. These motivations include maintaining a community with decreasing population, protecting against wild animals, and protecting a water source. Focusing on multi-functionality of forests may be a key to resolving anticommons situations. At the same time, the reintegration of timber production, which would reduce the costs of forest management, is occurring.
- Financing from outside institutions and legal assistance are critical. Profits from timber production alone cannot make these initiatives happen.
- Leadership is important in all three cases. One of the most difficult issues in resolving anticommons situations is bringing back the ownership of absent owners to insider owners or the community. In particular, negotiations with absent owners require skills, which the leaders in these cases have learned from their experiences outside the village.
- Keeping insider ownership appears to be important. In the second and third cases, buying back the ownership of absent owners was possible because the number of absent owners were relatively small. If the number of absent owners had been large, the initiatives mentioned here would have been impossible.

Lastly, we would like to speculate on the further development of this line of research. Heller (2008) provided a “medical model in structuring solutions (p.191)” for anticommons that consists of prevention, treatment, and alternative medicine. Alternative medicines include “Gossip, Shame, and Reputation,” “Voluntary Agreement,” and “Philanthropy.” The solutions presented in this study appear to have certain similarities to those “alternative medicines” in the sense that solutions in this

study were also created and tested on the ground and with a bottom-up style. What strengths and weaknesses these “alternative medicines” offer compared to more formal treatments often provided by official institutions is an interesting question. In fact, Progressive Property Theorists, a group of legal scholars, pay attention to creative functions of bottom-up style law-making (Peñalver, 2007). In a similar vein, from former common forests in Japan, we may be able to learn novel and innovative solutions to the tragedy of anticommons.

### **Acknowledgement**

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### **Acknowledgement**

The authors declare no conflicts of interest associated with this manuscript.

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<https://www.stat.go.jp/data/kokusei/2015/kekka.html>

Figure 1. Individual forest ownership patterns in Shiga Prefecture

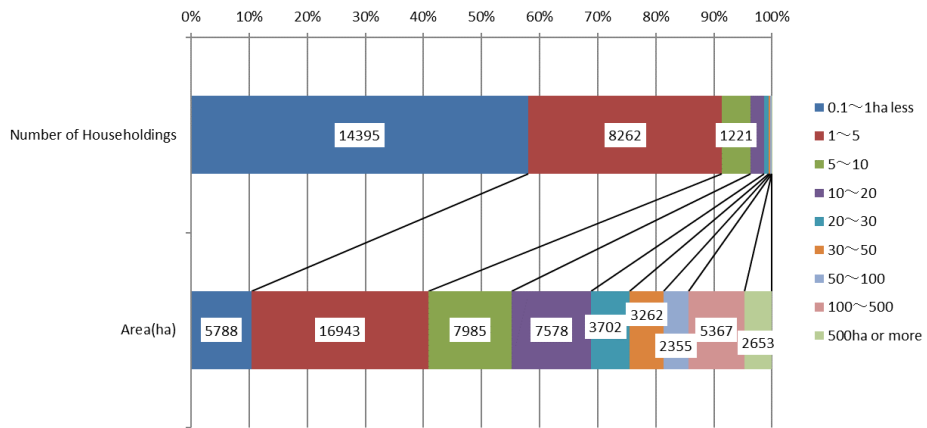


Figure 2. Conceptual framework of this study

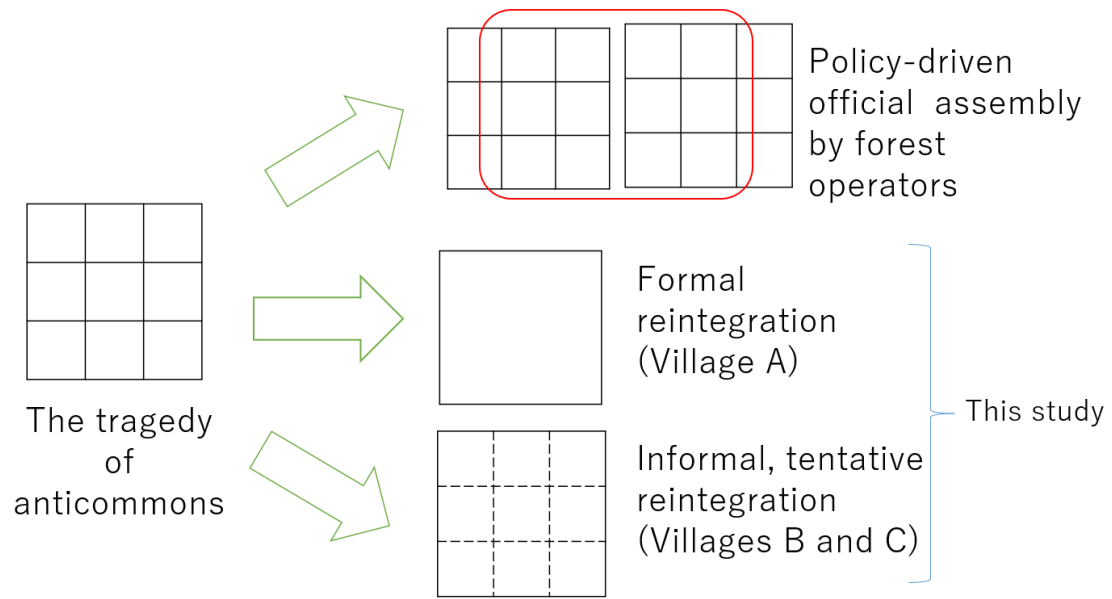




Figure 3. Map of Shiga Prefecture



National census borders (similar to community district borders) and forests (green shade)

Source:

<https://www.arcgis.com/home/item.html?id=bf1517e6867c416d817a46d0b444dc5f#visualize>

The map of the whole Japan cites the digital map (land basic information) published by the Geospatial Information Authority of Japan (GSI) and ESRI Japan's data on the municipality borders of the whole country.

Table 1. Comparison of three cases

Village	A	B	C
<b>Issue</b>	Decreasing population	Wild animals	Protection of water source
<b>Response</b>	Reintegration of titles	Subsidized program under a unified plan	Voluntary management of individual forests
<b>New use</b>	Shifting cultivation	Buffer against animal invasion, “sheep” garden	Charcoal production; bonfire
<b>Finance</b>	Rent revenue	Subsidies; timber sales	Donation from residents; subsidies
<b>Labor</b>	Subcontracting to a forestry cooperative	Subcontracting to a forestry cooperative	Own labor
<b>Driving forces</b>	Residents’ association	Residents’ association; Land improvement district	Common Land Association; Shrine parishioners’ association
<b>Leadership</b>	Former council member	Officer of the land improvement district	Local businessperson
<b>Legal rights</b>	Transformation from co-ownership to community ownership	Buyback of sold forests; demarcating outside borders	Buyback of sold forests