

Building Sustainable Communities on a Foundation of Natural Resources: Examples from the Use and Management of Geothermal Hot Springs in Bessho Onsen Property Ward, Nagano, Japan

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Abstract:

In Japan, Geothermal hot spring as common-pool resources has long been used and managed cooperatively and can not only support their users in a traditional economy but can also contribute to sustainable livelihoods in the present.

The purpose of this article is to clarify the mechanism of such the collective management system of geothermal hot spring resources through the examination of the case in Bessho Onsen Property Ward in Japan, Nagano, Japan. In the property ward whose system has roots in the traditional commons (Iriai) in Japan, efficient utilization and sustainable management of the hot springs has been realized under certain rules in spite of conflicting interests among the facilities, which mainly include communal baths, communal washing areas and inns. Local residents benefit from the communal baths on a daily basis, which are open to people in and outside of the area. The communal washing area is a neighborhood facility, which is open only to the members of the users' association among the residents of the Bessho Onsen area. Hot spring baths inside the inns are used exclusively for business purposes such as for visiting tourists.

Our research makes it clear that the hot spring sources, on which different users depend, are owned by the Property Ward, and their management and maintenance, as well as water distribution, are under the overall and comprehensive management of the Property Ward. The Property Ward has been paying careful attention to preventing water depletion at the hot spring sources through scientific evaluation by specialist as well as consistent daily maintenance by the Property Ward assembly members.

Our research also finds that such a way of hot spring resource management has an institutional characteristics and devises arranged by property ward. In order to deal with serious conflicts of immediate interests among the users, the Property Ward prepared a decision-making mechanism which helps toward finding a resolution to suit all concerned parties. We found evidence of the mechanism in operation in (1) the method used for selecting assembly members, which has been carried out conventionally, and in fundamental important roles of the Administrative Research Council established within the Property Ward, and in (2) the multilayered collaboration (governance) of various organizations with the Property Ward placed as the core entity.

Keywords: Communal Bath, Communal Washing Area, Resource Management, Property Ward, Bessho Onsen, Local Rules

Introduction

In recent years, it has become increasingly difficult to foresee the realization of the

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sustainable and self-supporting regional economy based on natural resources in developed countries, where agriculture, forestry and fisheries are on the decline, particularly in Japan. Natural resources, whether owned or not owned, which assume a role as a 'source of economic benefit', are not utilized and sustainably managed once they are no longer relevant in the market. This is obvious enough without the need to provide the example of artificial forests in Japan, which have been neglected due to domestic lumber being overwhelmed by imported lumber.

However, it has been clarified through recent studies of commons in Japan² that there still exist a considerable number of regions where residents in the community, without profit expansion being the sole motive, have managed and conserved natural resources as a local common property (commons) traditionally and autonomously (communally). In those communities, mountains, fields, oceans and rivers, which have been inherited as a common property (*iriai* property³), are commonly used and managed through collaborative works, called *shutsueki* or *buyaku* or *Fueki*, with participation of all the community members.

On the other hand, natural resources retaining sufficient market value have also been managed collectively by specific community people according to the individual local rules reflecting the characteristics of natural resources and the circumstances of the community which vary by region. A typical example can be seen in the community management of hot springs.

For Japanese people, a hot spring is a useful natural resource which can be used for medicinal purposes, as typified by *toji* (hot spring therapy), or used for washing wild plants, leafy vegetables and clothes in self-sufficient communities. In addition, the recent "onsen boom" has brought a big tourist resource to hot spring areas. However, a hot spring resource, which has multiple utility values, is always at risk of the depletion of its source due to excessive drilling and overuse. In this light, it contains strong characteristics of common pool resources (CPRs), and is one of the typical environmental resources whose management should be under strict scrutiny in Japan.

1 Research Task and Method

(1) Primary task of the research

It has been noted in the past that the postwar onsen boom caused a decrease in the amount of spouting water as well as a decrease in the temperature of geothermal spring water in many hot spring sites in Japan (Kawashima et al eds, 1964). As Yamamura (2005) points out, sustainable use of hot spring resources still stands as a top-priority issue. The biggest factor which adversely affects sustainability may be the disorganized development of hot spring sources and the excessive use of hot spring water through large amounts of pumping. It has been pointed out that the Hot Springs Act (enacted in 1948) does not sufficiently control the utilization volume, nor do the measures implemented under the leadership of public administrative bodies (national, prefectural, and city governments)⁴.

Meanwhile, it is noteworthy that in traditional rural hot spring communities a sustainable use and management system of geothermal hot springs has been established through collective action efforts with geological, economic and cultural

² See Akimichi(1999), Miyauchi eds.,(2006), Suga(2006), Mitsumata et. al eds.,(2008), Murota ed., 2009 and Mitsumata et al eds. 2010.

³ Please refer to the article introducing the Iriai institution (commons in Japan) from the perspective of commons theory written by McKean (1986).

⁴ See Kawashima et al eds.,(1964) et al. op. sit., 413-422, Sasaki(2004).

conditions taken into consideration⁵. In such a system, local rules in the community are maintained, or newly devised if necessary, and so it is evident that there is a possibility to realize the effective use and sustainable management of geothermal hot springs⁶.

Since the beginning of the Meiji period, however, the village-based communal management system of geothermal hot springs was obliged to be tentatively transferred to private-owned, cooperative-owned, company-owned or municipality-owned systems with the adoption and establishment of the modern land ownership system. On the other hand, there are some cases where hot springs are owned in the form of a corporate body, such as an incorporated association or a property ward, which substantially inherit the same nature and characteristics of village communities⁷.

Among those corporate bodies, the current status of property wards is known to some extent. As of 2007, the number of property wards in Japan which own mineral springs was 18⁸. The purpose of this paper is to clarify the mechanism of the collective management system of geothermal hot spring resources and look at the possibility of local communities as a management body of hot spring resources through the examination of the case in Bessho Onsen Property Ward, Nagano, Japan (hereinafter referred to as “the Property Ward”), which integrally owns and manages hot springs in the area.

(2) Research method

Regarding the general administration of Bessho Onsen Property Ward, which is the management body of hot springs in the area, we conducted interviews with assembly members and contract staff members of the Property Ward (December 2009 and April 2010), and collected historical and statistical information relating to the Property Ward (December 2004 to July 2010). We also interviewed a local historian (hereinafter referred to as Mr. A), who was formerly an assembly member, about the historical background of the management of hot springs (July 2010). Accompanied by the contract staff of the Property Ward, the precise location of each hot spring facility was identified using GPS technology and field investigation of all of the hot spring sources, as well as the communal baths and washing areas (April 2010). A questionnaire survey of every household on the actual usage conditions of the communal baths and communal washing areas by district residents was conducted with the cooperation of each district (distributed in April; collected in May 2010; no. distributed: 484; no. collected: 332; collection rate: 68.6%). A written survey was administered to each district director regarding the management of the communal washing areas (April 2010). Furthermore, face-to-face interviews with users of the communal baths and washing areas were arbitrarily conducted (December 2004; April and July 2010).

(3) Outline of the research area

Bessho Onsen is located in the east of Nagano Prefecture, about two hours from Tokyo by Shinkansen known as the bullet train, is a network of high-speed railway lines in Japan operated by four Japan Railways Group companies. The area exhibits the characteristics of an inland climate whereby day and night temperatures vary considerably, and with annual precipitation of as little as 900mm per year. The Bessho Onsen area is located on the edge of a basin covering a few square kilometers, named

⁵ See Ishikawa (2003, 2006, 2007, 2008).

⁶ See Ishikawa(2009).

⁷ See Kakashima et al. op. cit., p408-413, p439-488, and Hojo (2000; 47-48).

⁸ See Izumi et al (2009)

“Shioda-daira”, in the southeast of Ueda City, about 10km southeast of the city center (Fig. 1).

Bessho Onsen is said to be the oldest existing hot spring in the Shinshu area. According to historical records from 1706, there were five public baths named Oh-yu (big bath), Daishi-yu (monk’s bath), Ishi-yu (stone bath), Chomei-yu (long-life bath), and Koga-yu (Major Councilor, Koga’s bath), with the first three still in existence. The area was an agricultural and mountain village with sericulture and wood charcoal production sustaining the area. Hot spring inns located near the hot springs were also prosperous. In the Meiji Period, there were more than 30 hot spring inns⁹, of which 18 are still in business.

Records state that in 1622 the hot spring sources and facilities fell under the control of the Sengoku-shi clan, which already owned other facilities in the area such as “Ocha-yashiki” and “Goten”. In 1871, following the Meiji Restoration, they became government owned¹⁰. In 1889, however, inn owners formed a mineral spring association in former Bessho Village and took on management of the hot springs. In addition, the association submitted a request for a rental permit of the hot spring site to the governor of Nagano Prefecture and received permission in 1891. In 1916, the disposition of the site was approved by the government, and Bessho Village bought the hot spring for 5,497 yen, a sum equal to the village’s annual budget at the time, and made it a communal property of Bessho Village.

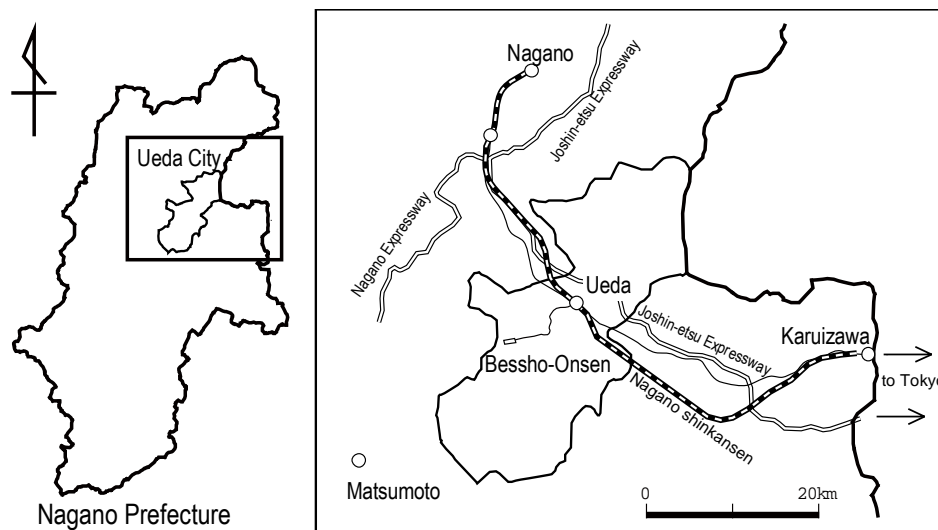


Figure 1 □ Location of Bessho-Onsen

In 1956, when Higashi Shioda-mura(mura means a village or hamlet), Naka Shioda-mura and Nishi Shioda-mura were amalgamated into Shioda-cho(cho means a town), Bessho Onsen Property Ward was established to become an entity to hold ownership of the hot springs. In 1970, when Shioda-cho was incorporated into Ueda-shi (Shi means a city), the Property Ward retained ownership and, at the time of writing, continues to own it.

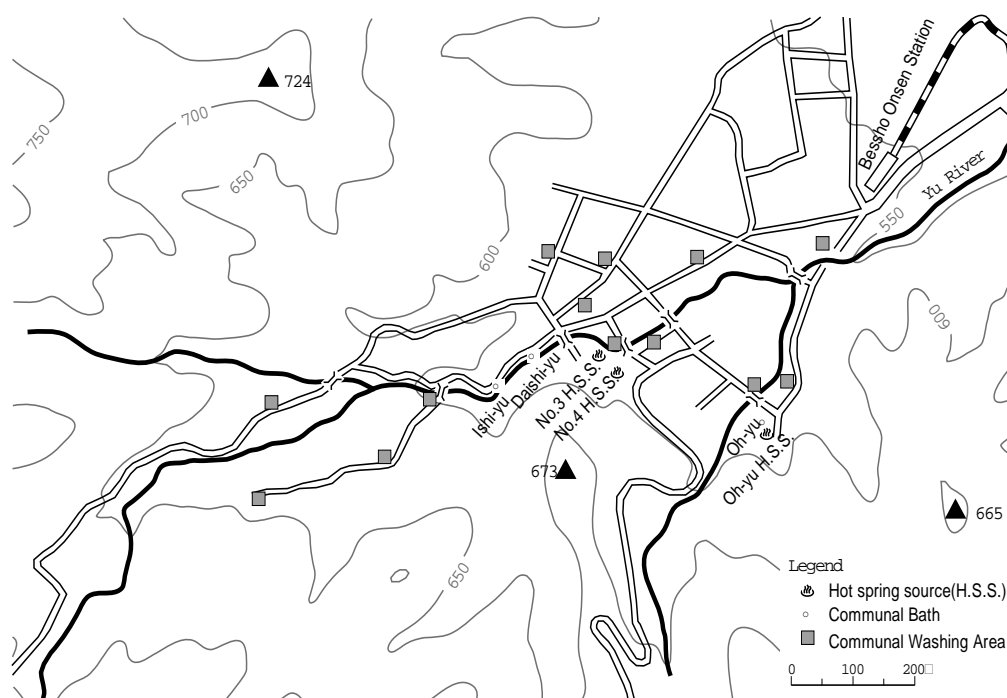
⁹ See Iijima (1900: 40)

¹⁰ According to records, Daishi-yu, Oh-yu and Chomei-yu were exclusively used by the Sengoku-shi clan, so it seems legitimate that these three became government owned. On the other hand, the records show that Ishi-yu and Koga-yu were used by the local people through the payment of a tax. They also paid the whole cost of bathroom repairs. Therefore, it is questionable as to why these two became government owned in 1868 (the first year of the Meiji period) along with the other three hot springs.

As of June 2009, Bessho Onsen Property Ward comprised 4 community associations (Waze, Innai, Ohyu, Wakasare) in 13 districts (Hikage, Hinata, Yubata, Daimon-nanakuri, Nishi-machi, Higashi-machi, Shin-michi, Higashi-ohyu, Nishi-ohyu, Yukawa, Higashi-wakasare, Nishi-wakasare, Kita-wakasare), with its population of 1,494 made up of 686 households¹¹.

2. Actual usage conditions of hot spring facilities

In Bessho Onsen Property Ward, there are 3 communal baths and 15 communal washing areas serving as communal hot spring facilities for local residents. However, one of the communal washing areas, where a few households have their own hot spring source, is not discussed in this paper, as we focus on an overall management system by the Property Ward. Figure 2 shows the 3 communal baths and 14 communal washing areas with which this paper is concerned.



This map was drawn up based on a topographical map reduced by 25000, issued by the Geographical Survey Institute, and by field investigation using GPS.

Figure 2 □ Map of communal hot spring facilities in Bessho Onsen

(1) Actual usage conditions of communal baths

The communal baths which are currently open are Ishi-yu, Daishi-yu and Oh-yu. These baths, marked as one of the area's main tourist attractions, are open to the public for an admission fee of 150 yen (equivalent to about \$ 1.8 in Oct of 2010, so this is cheap as an admission of hot spa). In 2008 they were visited a total of 227,090 times¹². These communal baths also serve as a jointly shared facility and are generally perceived by local residents as being "a bath for all the people in the area". In the next section, we will look at this situation by examining the results of the questionnaire survey of every household, conducted in 2010.

The collection rate of the questionnaire was about 70%, of which 80% answered that they use a communal bath. This indicates there are family members in the vast majority

¹¹ According to the historical materials of the Property Ward.

¹² Website of Bessho Onsen Property Ward: http://www.geocities.jp/besshoonsen_zaisanku/

of households who use a communal bath. Although the three baths are all located in the center of the Bessho Onsen area, there is not much difference in the number of households who use a communal bath between the different districts. Compared with the case of washing areas, which will be discussed later, it shows that a communal bath is a widely utilized resource for the residents of the Property Ward (Table 1).

Name of the Area	Communal Bath (valid respondents 323)		Communal Washing Area (valid respondents 319)	
	Existence or nonexistence	Utilization rate	Existence or nonexistence	Utilization rate
Hikage	none	82%	3 locations*	84%
Hinata	none	73%	2 locations*	60%
Yubata	Ishi-yu, Daishi-yu	50%	none	0%
Daimon-nanakuri	none	92%	1 location	20%
Nishimachi	none	69%	1 location	50%
Higashimachi	none	81%	2 locations	63%
Shindou	none	82%	1 location	74%
Higashi-ohyu	none	77%	1 location	46%
Nishi-ohyu	Oh-yu	75%	2 locations	65%
Yukawa	none	100%	1 location	100%
Higashi-wakasare	none	92%	1 location**	20%
Nishi-wakasare	none	84%	1 location**	8%
Kita-wakasare	none	59%	1 location	7%
Entire Bessho Area		80%		40%

Remark: This questionnaire survey was conducted in 2010.

Note: * of which one washing area is shared by Hikage and Hinata

** one washing area is shared by Higashi-wakasare and Nishi-wakasare

The average number of family members in a household who use a communal bath is 2.13 (maximum value: 8). Age and gender differences among users is small in comparison with the case of the communal washing area, demonstrating that the communal bath is widely utilized by men and women of all ages (Table 2). From this information it can be inferred that a communal bath tends to be used by the whole family.

As has been shown, a communal bath is a facility that is open to outside visitors, while at the same time also serving as a daily-use facility for all of the local residents.

(2) Actual usage conditions of communal washing areas

There are some districts which have multiple communal washing areas, while others have no communal washing areas at all (Table 1). According to the interviews in the Property Ward, together with the questionnaire survey with the heads of the community, each household uses a regular washing area, and pays the maintenance and management costs for the washing area. According to the interviews, the purpose of using a washing area includes washing clothes, washing vegetables (*ona-arai*; 'o' is a prefix to wards as a polite usage and 'na' means leaf of vegetable, and 'arai' indicates the meaning of wash), and removing excess salt from pickled vegetables.

The result of the questionnaire indicates that the ratio of households which use a washing area is 40% in the Bessho Onsen area as a whole, though this figure varies by district. In a district without a washing area, few families use one. In a district with a washing area, especially the ones with multiple washing areas, the opposite is true (Table 2).

Table 2 Usage Conditions of Communal Baths and Washing Areas by Age and Gender

Age	Communal Bath			Communal Washing Area		
	Male	Female	Total	Male	Female	Total
90s	0	2	2	0	1	1
80s	20	23	43	7	13	20
70s	52	75	127	22	48	70
60s	61	65	126	14	27	41
50s	31	37	68	8	21	29
40s	18	21	39	4	7	11
30s	20	26	46	2	4	6
20s	11	10	21	0	3	3
10s	9	12	21	1	2	3
0-9	19	24	43	1	0	1
Unknown	0	3	3	0	0	0
Total	241	298	539	59	126	185

Remark: This questionnaire survey was conducted in 2010.

This reflects the fact that each washing area is mostly used by specific residents living in the immediate vicinity of the washing area. The average number of family members in a household who actually use a washing area is 1.53 (maximum value: 4). Users mainly comprised women in their 60s and 70s (Table 2), indicating that housewives are the main users of the communal washing areas. When we conducted an observational study of the washing areas, users were all middle-aged and elderly women.

It is clear that a communal washing area is not only a facility which is closed to those from outside of the area, but is also a place where users are limited and specified. Yet it is also certain that many residents benefit from these washing areas, which are placed in as many as 14 locations.

3. Use and Management of Geothermal Hot Springs and Facilities Led by the Property Ward

(1) Ownership of hot spring source

The form of ownership of the hot spring source in this area has its roots in the *iriai*-type (commons-type) utilization and ownership based on old Bessho Village as a unit. Its operation and management are conducted under the property ward system legally based on the provisions of the Local Autonomy Law. It is generally considered that the Property Ward, which has a corporate status as a 'special local public entity', has autonomous administrative powers of its own initiative¹³, although in some property wards intervention by local government can become excessive due to the characteristics of "nominal government ownership"¹⁴.

(2) Property Ward's overall management of hot spring Source and distribution of hot spring water

In the Bessho Onsen area, there are three hot spring sources: No.3 (flow-through type, 1976), No.4 (self-spouting type, 1976) and Oh-yu (natural-flow type). No.1 and 2 Hot Spring Sources, drilled from 1954 to 1955, ran out in 1979. As of 2010, the capacity of discharge is a total of 1,830 liters per minute, which is made up by No.4 Source

¹³ Kawashima et al eds., (1968) and Watanabe (1974) describe the property ward institution in detail. According to their work from the social laws view points, property ward have a right to manage autonomously their property in their own way. It follows that the municipality should or must not interfere with their way of resource management without the respect for independency of property ward.

¹⁴ This sort of case study is introduced by Saito & Mitsumata(2010:13-37).

(1,300ℓ/min.), the main source; No.3 Source (380ℓ/min.); and Oh-yu Source (150ℓ/min.) (See again Fig. 2)¹⁵.

Hot spring water from No.4 Source is distributed to 17 inns, 11 public facilities and 14 communal washing areas. The amount of distribution is 687ℓ/min., 222ℓ/min. and 45ℓ/min., respectively. From No.3 Source, hot spring water is distributed to the communal baths and the facilities of the Tourist Association (87ℓ/min.). From Oh-yu Source, hot spring water is distributed to the communal baths and 2 inns (80ℓ/min.). As of 2009, the total distribution amount was 1,119 liters per minute.

Basically, hot spring water is distributed under the rental agreement between the Property Ward and each entity using hot spring water, but conditions of the agreement vary by entity. Inns pay 35,660 yen /ℓ □min. and public facilities, including Aizenkaku run by Ueda City, pay 2,500 yen/ℓ□min, while hot spring water is distributed to the communal baths directly run by the Property Ward without charge. In addition, some of the entities obtain recompense for the depletion of their hot spring source, etc. which may occur as a result of further development of hot spring sources¹⁶. According to Mr. A, hot spring water has been distributed preferentially to the communal baths jointly owned by the residents of Bessho District, with surplus water distributed to the inns and relevant facilities. The amount of distribution to the 17 inns is decided by the president of the Inns Association based on the size and business performance of each inn.

After No.1 and No.2 hot spring sources had been exhausted, the Property Ward decided to entrust the evaluation of the hot spring source, including the underground water level, quality and temperature of the hot springs, to the Hot Spring Research Center. A management plan is designed based on the evaluation results. The total distribution amount has been adjusted to 1,000 liters per minute accordingly.

The maintenance of the water supply equipment, including plumbing, is planned and carried out by the Property Ward. Costs for piping extension and maintenance, conducted when needed, as well as the evaluation of the hot spring source by the Hot Spring Research Center are entirely paid for by the Property Ward. The annual revenue of the Property Ward is 83,469,000 yen. A total of 55,120,690 yen, which includes the rental fees paid by hot spring users (28,018,000 yen), and the admission fees for the communal baths (26,600,000 yen), accounts for more than half of the revenue¹⁷.

(3) Operation and management of the communal bath

The three communal baths are run directly by the Property Ward. *Bandai* (staff at the baths), who collect admission fees, clean up bathing areas and restrooms, etc. are selected from among the residents of the Property Ward and employed on a one-year contract. At each communal bath, two teams of two personnel (usually a couple) are assigned as *bandai*, with one team working from 06:00 to 14:00, and the other from 14:00 to 22:00. In total, 12 people are employed by the Property Ward at three communal baths. The baths are closed from 22:00 until 06:00, during which time a deep clean is conducted by a private company from Shioda District entrusted by the Property Ward at 200,000 yen per year. Assembly members (which will be discussed in

¹⁵ Mr. A, a local historian, emphasized that the drilling of No.3 and No.4 sources caused a revolutionary change in the improvement of the hot spring water in Bessho Onsen whose discharge amount had been scarce and temperature low.

¹⁶ A compensation fee was paid either by cash or by hot spring water supply. The range in compensation is projected to become larger due to further assurance and development of hot spring sources. In the case where the right to obtain recompense is inherited, the number of beneficiaries (including those outside the Bessho district) may be increased. The Property Ward is concerned about this issue.

¹⁷ Actual performance as of 2008 (according to the material of the Property Ward).

detail later) of the Property Ward (four members in charge of the communal baths) are responsible for supervising overall work regarding the communal baths such as the work performance of the staff and the hygienic conditions of the baths.

(4) Management of the communal washing area

Table 3 shows basic information regarding the communal washing areas. There are districts with and without communal washing areas. According to the interviews conducted in the Property Ward and the responses to the questionnaire given to the heads of the community associations, each washing area is regularly used by specific households, and its management and maintenance costs are paid for by the users.

Name	Location	Managed by	Written Regulations
Wakasare (tentative)	Higashi-wakasare	Users' Association	Existent
Higashimachi1 (tentative)	Higashimachi	Users' Association	Not existent
Higashimachi 2 (tentative)	Higashimachi	Users' Association	Not existent
Nanakuri	Daimon-nanakuri	Daimon-nanakuri District	Not existent
Yukawa	Yukawa	Yukawa District	Existent
Nishi-Ohyu 1 (tentative)	Nishi-Ohyu	Nishi-Ohyu District	Not existent
Nishi-Ohyu 2 (tentative)	Nishi-Ohyu	Nishi-Ohyu District	Not existent
Shinmichi-chiku	Shinmichi	Shinmichi District	Not existent
Nishimachi	Nishimachi	Nishimachi Districe	Not existent
Higashi-Ohyu (tentative)	Higashi-Ohyu	Higashi District Ohyu	Not existent
Hikage 1 (tentative)	Hikage	Users' Association	Not existent
Hikage 2 (tentative)	Hikage	Users' Association	Not existent
Hikage/Hinata (tentative)	Border of Hikage and Hinata	Users' Association	Not existent
Hinata (tentative)	Hinata	Users' Association	Not existent

Remark: Written survey to the director of each district (2010).

There have been communal washing areas since early times in the Bessho Onsen area. Every household needed such a washing area on a daily basis, but today, now that washing machines and water heaters have become common household appliances, few people use the communal washing areas. As a result, the communal washing area has become a facility for limited users and is managed in the form of a voluntary association¹⁸. The actual conditions of the different communal washing areas vary: for example, some have a name, staff, or regulations, while others have none of these. (Table 4)

¹⁸ It may be better to consider that the communal washing areas are used by groups of neighbors, rather than by a district unit. For example, the washing area located between Hikage and Hinata is shared by the people of both districts; Nanakuri washing area is shared by the people of Daimon Nanakuri and Shindo; and Shindo washing area is shared by the people of Shindo and Nishi-wakasare. Thus, it can be pointed out that the management by voluntary associations is appropriate to the actual conditions of the communal washing areas.

Table 4 Organization, Usage and Management Regulations of the Communal Washing Areas

Name of the organization	Some with names, the others with no names
No. of Representatives	One to three
Decision Making	Through the general meeting (none in some areas)
Membership Fee	A few hundred yen through a few thousand yen
Registration	By oral application (initial fee required in some areas)
Daily Maintenance	Cleaning by rotation
Extra Maintenance (repair, etc.)	Costs collected by the members
Terms of Use	Cleaning after use (disposal of empty soap box, etc.)
	Observation of utilization time
	Others (No rinsing allowed in hot water pot; No animals allowed. ; No soap allowed.,etc.)

Remark: Prepared by the authors based on the field study in all the washing areas and the questionnaire conducted in 2010.

There are eight voluntary associations and 5l/min. of hot spring water is distributed to each of the entities. In the district where there are two washing areas, the distributed amount is divided into two amounts of 2.5l/min. Despite the lower frequency of use than before, in some districts the number of new members has increased, or a new washing area has been established. For example, a new communal washing area was placed in Shindou District and started to receive the distribution of hot spring water in 1990. A woman we met at the washing area in Shindou told us that she uses the washing area daily to wash dishes and clothes even though she has a washing machine at home. The reason she gave was that marks and stains which are difficult to remove with a washing machine are removed more easily by hot spring water.

Rules for use and management differ depending on the association of each communal washing area, but most of the districts have some rules in common: Users should clean the washing area by rotation; they should only use a specific kind of soap, etc. In addition, as a tank of hot spring water will become dirty on contact with the air due to the precipitation of insoluble substances in hot spring water, the members of the associations, together with the district residents, jointly clean the tank at the washing area on the first Sunday of April every year. According to the staff of the Property Ward, the cleaning is conducted instead of "*michi bushin*" (road maintenance), done by all residents of the district in older times. The Property Ward collects 10,000 yen per year from each association and puts it toward the distribution of the water, but unlike the case of the communal bath, leaves the management and maintenance of the washing area to each association.

(5) Management of hot springs through inns' autonomous water-saving

In this district, which receives low rainfall, an annual water-saving initiative called "10 percent cut in water use" is implemented for three months from July to September. This is an attempt to reduce the hot spring water supply by 10 percent, voluntarily conducted by inns, communal baths and relevant municipal facilities without discounting the rental fee paid to the Property Ward. The idea for this initiative was brought about by Mr. A, who runs an inn as a family business. Mr. A also serves as an assembly member in charge of hot springs in the district and has done so since before the Property Ward was established. He also witnessed the process of the drilling of hot spring source No. 1 and No. 2, through to their depletion. Mr. A called for the "10 percent cut in water use" initiative in 1985 when he was an assembly member of the Property Ward, but at first a water-saving system without a discount of the rental fee was an unacceptable proposal

for the owners of the inns who bore half the cost for the drilling of the hot spring sources and wished to attract guests by offering as much hot spring water as possible. However, in an interview given in July 2010, Mr. A explained that he managed to persuade the inn owners to implement the initiative by telling them that “the hot springs are alive and well, and a source of living for the people in the district”. The initiative has been in effect for 25 years. Furthermore, the Property Ward asked for the cooperation of Ueda City and as a result the initiative was also implemented in the municipal facilities of Ueda City three years ago¹⁹.

(6) Efforts toward water source conservation

The Property Ward is aware that, in addition to low precipitation, the amount of hot spring water discharge has decreased since the river bed in the lower course of Yukawa River, which runs through the village, was covered with concrete. Based on this awareness, the Property Ward expressed opposition when a plan was drawn up to create an asphalt-paved parking lot close to the hot spring source. The upper stream of Yukawa River, located in Hinata District, is currently not yet encased in concrete on three sides (*sanmenbari*). The Property Ward required Ueda City, which has an intention to regulate the river in this district, to review the project.

Also, the Property Ward has been positively implementing forest improvement measures in the district. Silvicultural activities of artificial forests in the district, which are *iriai* forests owned by former Bessho Village in the name of district-owned forests or shrine/temple-owned forests, have been carried out not only by local forest cooperatives, but also by community-based collaborative work involving four community associations (Wade, Innai, Ohyu, Wakasare). As of 2010, collaborative work has not been conducted as trees have grown enough and light cultivation work such as weeding is no longer necessary. Nevertheless, based on the recognition that forests may influence hot spring resources, the Property Ward is still entrusting forest maintenance to the forest cooperatives at the expense of about one million yen per year.

4 Decision Making Regarding Use and Management of Geothermal Hot Springs

(1) Selection process of the assembly members of the Property Ward

Bessho Onsen Property Ward employs a parliamentary system as a decision-making body. The assembly of the Property Ward has its own voting rights regarding relevant properties. Unlike a general meeting or a board of trustees, which are optional decision-making bodies that a property ward is allowed to set up if desired, an assembly can exercise stronger powers to reflect the will of the property residents²⁰.

The number of seats in the assembly of Bessho Onsen Property Ward is ten. Members of the assembly are appointed by election under the Public Offices Election Law. However, except for the election in 1982, members have always been selected without a vote because fewer than eleven candidates stood. The criterion for selection is as follows:

Regional breakdown of the assembly members: 1 from Wade (1 per 52 households), 5 from Innai (1 per 12 to 42 households), 2 from Ohyu (1 per 38.5 households), 2 from Wakasare (1 per 108.5 households) (Table 5).

¹⁹ On the other hand, it is said that younger inn owners who do not know about the depletion of No.1 and No.2 hot spring sources tend to request the expansion of the hot spring water supply.

²⁰ See Watanabe (1974). This is the one of liable and influential books to understand property ward institution itself ranging from its historical emergence to present issues such as inconvenience or conflict between municipality and property ward on the basis of his abundant research.

District	Community	No. of Households*	No. of Assembly Members	Characteristics of Districts
Waze	Hikage	34	1	Agriculture & Forestry
	Hinata	18		
Innai	Yubata	12	1	Inns & Stores, etc.
	Daimon-nanakuri	13	1	
	Nishimachi	37	1	
	Higashimachi	42	1	
	Shinmichi	34	1	
Ohyu	Higashi-ohyu	18	2	Inns & Stores, etc.
	Nishi-ohyu	43		
	Yukawa	16		
Wakasare	Higashi-wakasare	58	2	New Residential Area
	Nishi-wakasare	112		
	Kita-wakasare	47		

Remark: Prepared by the authors based on the interviews in the Property Ward (2010).
*number of questionnaires distributed is equal to the number of households

Of the ten members, three members are selected from among the inn owners, so that the will of the major districts of the hot spring area can be reflected. Conversely, it may safely be said that to bring inn owners into the assembly serves as a “safety valve” to prevent stakeholders from taking action which might be deemed detrimental to the interests of local residents, such as demanding the exclusive use of hot spring resources.

An organization called the Administrative Research Council was established within the Property Ward, which comprises the president of the Inns Association, the president of the Joint Community Association, a users’ representative and a knowledgeable person selected from among the residents, in addition to the chairperson and the vice chairperson of the Property Ward. This organization discusses issues more relevant to agendas and proceedings, compared to other councils (or meetings) created in collaboration with other entities, which we will look at in section (3). It is highly possible that the issues which are studied and discussed in this council will develop into proposals for the regular meeting of the assembly conducted once a month. Therefore, we can conclude that the Administrative Research Council plays a significant role in the community.

(2) Roles of assembly members and the monthly meeting

The assembly consists of six administration committee members, who are in charge of the management of plumbing and hot spring sources, and four communal bath committee members, who are mainly in charge of the communal hot spring baths. The head of the administration committee and one member of the communal bath committee, as well as the chairperson and the vice chairperson, form a general affairs committee that holds a regular meeting once a month. The director of the Shioda District Community Center on behalf of Ueda City joins the meeting. Meanwhile, the assembly’s regular meeting is held twice a year, in March and December.

(3) Collaboration between the Property Ward and other organizations

In addition to the Property Ward, there is also the Inns Association, the Tourist Association and the Joint Community Association in the Bessho Onsen area. The Inns Association comprises the owners of the inns and hotels; the Tourist Association comprises inns, hotels, eating and drinking establishments, and souvenir shops; and the Joint Community Association comprises directors of 13 districts. In addition to the meetings held within the Property Ward, issues regarding the use and management of the hot springs can be discussed among all the organizations involved.

The Discussion Meeting, in which the Property Ward, Inns Association and Joint Community Association participate, is held once a year. It was first regarded as a conversational meeting, but recently they have taken along more detailed information materials which have been used to discuss the operation and management of the hot springs. This meeting also serves to conciliate between the inn owners who want to receive as much hot spring water as possible and the Property Ward which wants to impose regulations to avoid the depletion of the hot spring resources.

In addition, the Four-way Meeting is held as and when necessary, where the Property Ward, Inns Association, Tourist Association and Joint Community Association meet together. The meeting was set up to provide consultation for when one of the entities has a problem and needs advice on how best to solve it.

As seen above, several opportunities for discussions are provided outside the Property Ward, in addition to the Property Ward's implementation of its own institutional measures, such as its selection guidelines regarding assembly members. It can be inferred that the Property Ward has carefully prepared a mechanism to jointly share problems, and at multiple levels prevents any entity from taking unilateral control of any aspect of hot spring management for its sole interest and profit.

5. Discussion

(1) Use and management of geothermal hot springs based on the autonomy of the

Property Ward

In the Bessho Onsen area, efficient utilization of the hot springs is realized under certain rules in spite of conflicting interests among the facilities, which mainly include communal baths, communal washing areas and inns. Local residents benefit from the communal baths on a daily basis, which are open to people in and outside of the area. The communal washing area is a neighborhood facility, which is open only to the members of the users' association among the residents of the Bessho Onsen area. Hot spring baths inside the inns are used exclusively for business purposes such as for visiting tourists, and so local residents cannot enjoy the benefits they offer. The hot spring sources, on which different users depend, are owned by the Property Ward, and their management and maintenance, as well as water distribution, are under the overall and comprehensive management of the Property Ward.

The Property Ward pays careful attention to preventing water depletion at the hot spring sources. The hot spring sources are maintained through scientific evaluation conducted yearly by the Hot Spring Research Center entrusted by the Property Ward, in addition to daily maintenance duties carried out by the assembly members. On scientific grounds, the Property Ward independently decides the upper limit of the hot spring supply, and organizes the distribution of the supply accordingly. Monitoring the conditions of natural resources is an important factor for their sustainable utilization²¹.

²¹ Many of scholars regarded the role on the monitoring as one of the important factor for building

However, it is particularly hard to monitor the conditions of invisible natural resources such as geothermal hot springs, and it is this monitoring difficulty which is considered to be one of the causes for their deterioration. Bessho Onsen Property Ward overcame this issue by entrusting the evaluation of hot springs to an external specialized institution, which uses scientific monitoring techniques. Furthermore, a unique characteristic is found in the way hot spring water is distributed to each facility. The Property Ward created the basic principle whereby maximum priority is placed on securing the necessary hot spring water supply for the communal baths, while allocating the remaining water to other facilities such as inns, communal washing areas and the Tourist Association. Hot spring water is supplied without charge to the communal baths and washing areas which local residents use daily with very low charge, while inns and hotels which make a profit through private business must pay a high rental fee for receiving the hot spring water supply. From the management standpoint of the Property Ward, it would make more commercial sense to place top priority on distribution to the inns. It should be noted that the Property Ward nevertheless took the opposite option. We can see here that the idea of “communal ownership of hot springs”, cultivated in the age of former Bessho Village, remains strongly rooted in the community, and has been supported by local residents’ daily utilization of these communal facilities over time.

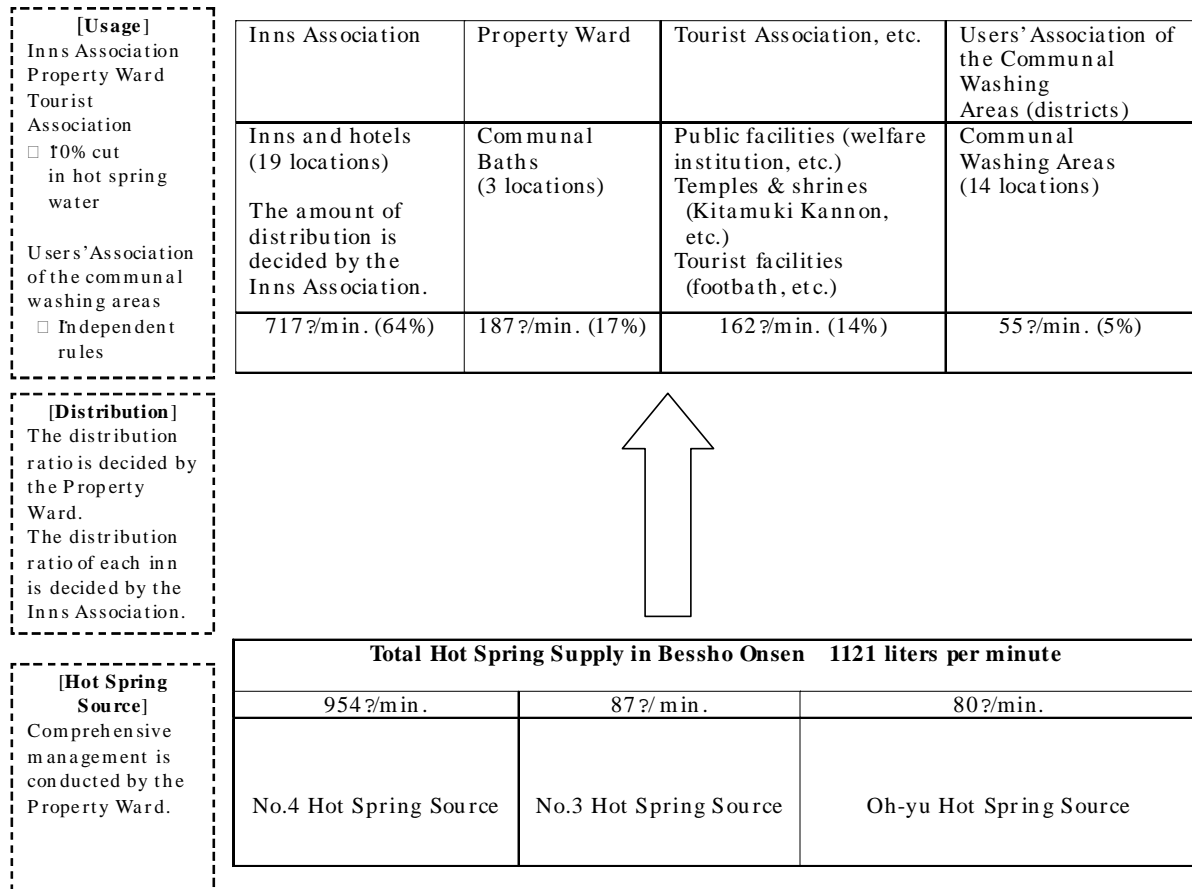
At one time, the form in which hot spring resources were regarded and managed – as communal resources owned by the entire local community – was the same across Japan. As hot spring sites became affected by tourism, however, such a form gradually disappeared²² in many cases. In contrast, the case of the Bessho Onsen area shows that the conventional form is not necessarily irreconcilable to tourism. In other words, a communal management system organized by the local community is able to respond to and engage with tourism in a positive manner which has little effect on traditional usage and management methods, together with minimal negative impact on the hot spring resources. Specifically, a property ward can take measures as and when necessary depending on the situation, such as opening up the communal baths to outside visitors, or distributing hot spring water to inns. Even in *iriai* forests, which are generally regarded as a typical example of communal use and management of natural resources, a flexible response by the community has been taken through a system such as *wariyama*, in which individual people can seek private profit by paying a rental fee to use a part of the forest²³.

long-enduring organization of CPRs which ‘design principles’ was shown in Ostrom’s early work; ‘Governing the Commons’ in 1990.

²² Hojo(2000) and his colleagues pointed out that the right of hot spring source has historically been belonged to the member of community and the characteristics of the right is very close to Iriai-ken(the right of the common) which is prescribed in the civil Law. As the market economy developed and the consolidation policy was carried out, the form of hot spring source management as mentioned above has gradually took place to other one in no or little relation with the community.

²³ See Kawashima et al eds.,(1968)

Figure 3 Management of the hot spring sources, distribution of hot water, and usage



Remark: Prepared by the authors based on the materials of the Property Ward and the interviews.

(2) Autonomous management by users

As we have so far seen, it is very important for the disciplined utilization of hot springs that the property ward exercises strong control and initiative over the process of the management of the hot spring source and distribution of hot spring water. At the same time, the efforts of individual entities using hot springs are not to be ignored.

Firstly, it is particularly worth noting that the Property Ward allows each user of the hot spring water to carry out most of the management by themselves once an outline of the distribution amount is determined. Among the users, it is considered understandable for inn owners to utilize the hot spring water independently as they pay a high rental fee for the distribution of the water. On the other hand, in the case of the communal washing area, to which hot spring water is distributed at a very low rate, it stands to reason for the Property Ward to exert strong control and instruction over the users of the washing area, considering its public nature. However, a tank of hot spring water is maintained through annual cleaning conducted on a large scale by users as well as all of the people in the district, and daily use and maintenance are also managed by the users' voluntary association under the individual use and management rules (Figure 3) of the association. These practices can be highly valued as a rational and efficient system, by which the Property Ward can reduce management costs, and the users can adopt a management method which meets their requirements and circumstances.

Secondly, the "10 percent cut in water use" initiative is implemented even in the inns

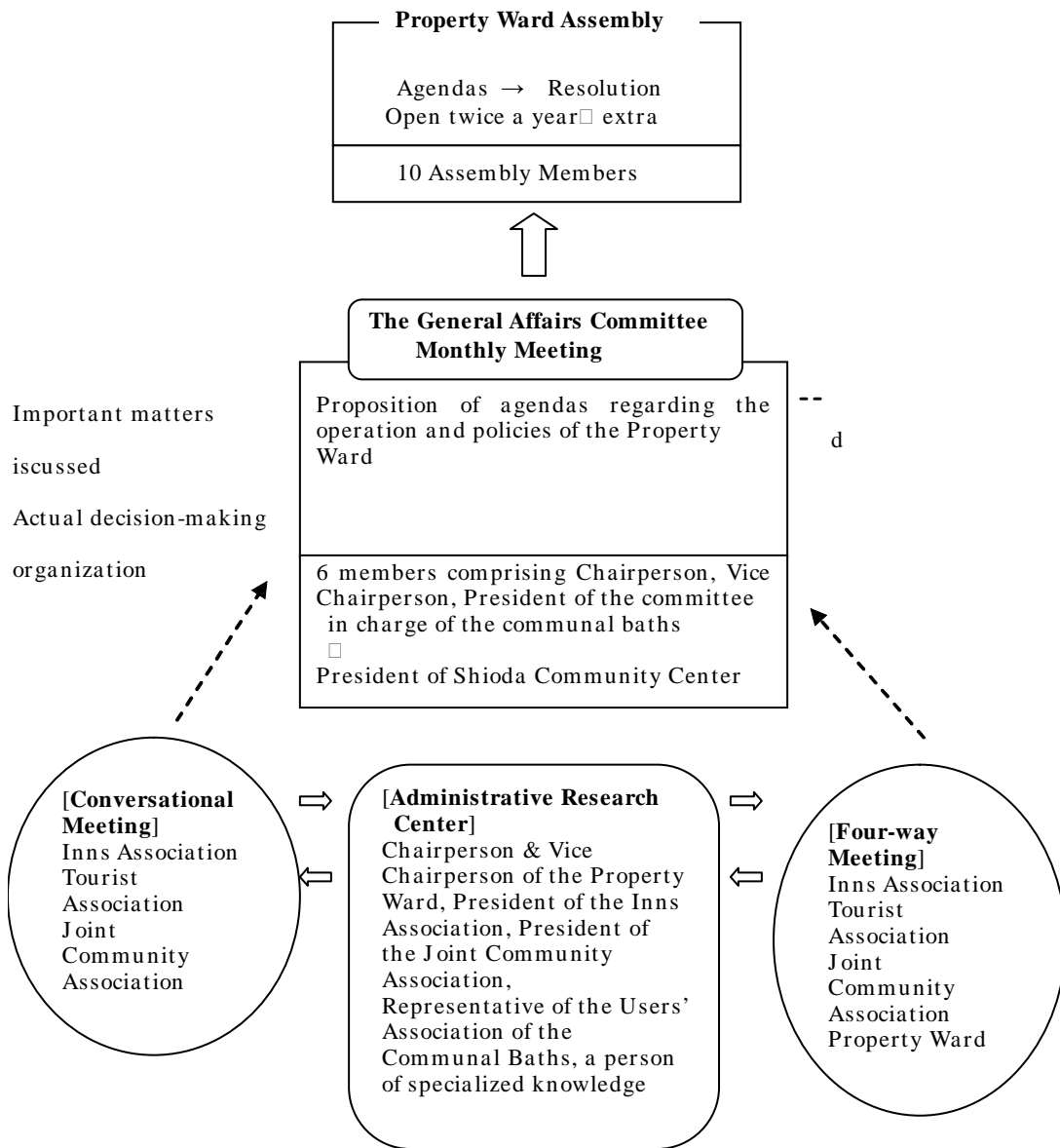
and other private facilities despite their wish to expend as much hot spring water as possible to make it worth the high rental fee. This important initiative teaches everyone to be aware that inns and communal baths can exist only by sustaining hot springs. In view of the process discussed in Section 5 of Chapter 3, it can be inferred that the depletion of No.1 and No.2 hot spring sources had a strong effect on fostering this awareness. We may also say that the implementation of the initiative was built on trust in the Property Ward, which has conducted overall management of the hot spring sources and the distribution of hot spring water.

The trust in the Property Ward's overall ability to manage and maintain the hot springs seems to have been built on its discerning judgment and power of execution of the measures required to preserve the hot spring resources by focusing not only on the hot spring resources themselves. For example, the opposition to the asphalt paving plan in the Bessho area; the petition for reviewing Ueda City's plan to encase the river with concrete; the management of *iriai* forests; and the conservation of groundwater - all of these indicate that the Property Ward has been implementing appropriate measures to cultivate and sustain hot springs. In order not to seek reconciliation of immediate interests of the related entities, but to realize the preservation of hot spring resources over the long term and enjoy the welfare generated from them, such an ecological perspective and its execution should not be underestimated as an effective driving force for eliciting cooperation from the entities using hot spring resources.

(3) Decision making process regarding the joint management of hot spring resources

It is also true that conflict of immediate interests among the users has been a serious issue. To deal with this problem, the Property Ward prepared a decision-making mechanism which helps toward finding a resolution to suit all concerned parties. We found evidence of the mechanism in operation in (A) the method used for selecting assembly members, which has been carried out conventionally, and in the roles of the Administrative Research Council established within the Property Ward, and in (B) the multilayered collaboration of various organizations with the Property Ward placed as the core entity (Figure 4).

Figure 4 Multilayered joint management of the hot spring resources



Remark: Prepared by the authors based on the interviews.

(A) is a necessary factor for redressing the balance of opinions among the users of different interests. The guidelines regarding the selection of assembly members do not exist in the form of written regulations. Instead, it is a common practice which has been observed conventionally.

Detailed rules, however, are formulated based on the degree of involvement with the hot springs. More members are selected from the central districts of the hot spring area, and the number of inn owners is limited to less than three, so that the development of the hot spring areas is promoted, while at the same time preventing the exclusive distribution of hot spring water to the inns. The Administrative Research Council, which has an important role as it influences the resolution of the assembly of the Property Ward, comprises the president of the Inns Association, who is not an assembly

member; the president of the Joint Community Association; a representative of the communal bath users; a knowledgeable person selected from among the residents; and the chairperson and vice chairperson of the Property Ward. This system works to harmonize the differing interests within the area by including people from different parties in the membership of the organization.

(B) is a requirement for helping users with different interests to share common awareness and to take cooperative action under the collective policies. In the Discussion Meeting, which comprises the Property Ward, Inns Association and Joint Community Association, and the Four-way Meeting, which comprises the Property Ward, Inns Association, Joint Community Association and Tourist Association, □ common awareness concerning the condition of the hot spring source is deepened among the entities, □ overall management conducted by the Property Ward can be assessed by the entities, and □ individual problems of the entities and their relation to the ongoing management system of the hot springs can be examined by the Property Ward. It appears that such bidirectional and multilayered discussions work well in an indirect manner in maintaining the comprehensive managerial order of the hot springs led by the Property Ward.

Concluding Remark

This paper has clarified that regional hot spring resources have been used and managed through the systems built up by communal use and management with the local community at the core, as opposed to being led by government or regional administration. We have also glimpsed the fact that “the natural resource management system led by the local community” has been formed through an arduous and complex procedure that cannot be discussed in a single article such as this. There is a viewpoint that a pervasive and growing market economy brings about the commercialization of resources, particularly natural resources, but at the same time breaks down and eliminates regional cooperation. Although this paper does not focus on this viewpoint, self-supporting regional utilization of hot spring resources (communal baths and washing areas) and hot spring tourism (commercial utilization of hot spring resources) has coexisted, at least in this area, on the premise that the hot spring source is collectively managed and maintained with a village as the base. As has been pointed out, however, the existing “natural resources management system led by the local community” has been maintained and transformed in a way that adjusts to issues within the community and responds to changes outside the community. In the present day, when the market economy deeply penetrates every part of society, the case of the Bessho Onsen area offers numerous ideas about how a “natural resources management system led by the local community” can be created and maintained.

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