



# Factors That Shaped the Forestry Extension System in Japan: Adoption and Adaptation of the United States Model After World War II

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Accepted: 2 February 2024  
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## Abstract

Systems for small-scale forestry are occasionally shaped by adopting models used by other countries. Such adoption is localized and adapted to suit needs and conditions of the country and reflects its specific characteristics instead of being simply copied. In this study, we examine the process of the adoption and adaptation of the forestry extension system in Japan and discuss the meaning of policy transfer across countries and the factors influencing policy development. Although the adoption of the forestry extension system was de facto a direct coercion enforced by the occupying United States (US) government in the early post-war era, in-depth analysis revealed it was a joint effort between Japanese and US foresters. The enthusiasm of foresters in charge of forestry extension enabled them to improve it into an idealized form. This first adaptation phase can be regarded as a very progressive step in view of trends indicated by a previous study. The adoption of the US model inspired and legitimized the new system. Results imply that policy development occurs at the level of the ruler, who sets the direction of the forestry extension, and the level of the practitioner, who is in charge of the extension activities in the field. Moreover, it demonstrates the importance of examining the significance and effectiveness of policy transfers and the adaptation of adopted institutions at each level. However, motivation and perception of practitioners toward their work and allowance for voluntary initiatives given to them is the key to this notion.

**Keywords** Foreign model · Knowledge generation · Power balance · Japan · Coercion · Policy development

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## Introduction

Small-scale forestry is characterized by diversity. Its definition differs across countries (Harrison et al. 2002); even within the same country, its meaning changes over time (Schraml 2004; Hatcher et al. 2013), which is unsurprising given the variations in natural and socio-economic conditions among countries. Interestingly, however, common systems and features can be observed. Often-times, they reflect similarities in conditions or address a common global issue. Furthermore, systems for small-scale forestry in one country are frequently shaped by the conscious adoption of models from other countries.

Historically, knowledge and institutions regarding forestry have frequently been transmitted from one country to another. The most typical example is scientific forestry, which emerged in Germany in the eighteenth and nineteenth centuries and spread to other countries around the world (Hölzl 2010; Scott 1998; Ubukata 2021). In the late twentieth century, forest policies and their development underwent another period of change across and within countries and became more internationalized in countries undergoing regime transition and democratization such as Central and Eastern Europe (Pachova et al. 2004). Interestingly, transmission does not indicate that the original models were simply copied. Countries adapted and localized these models to suit their specific needs and conditions. The emergence of tropical forestry in tropical countries, where scientific forestry was introduced through colonial rule, is another example (Ubukata 2021; Mizuno 2022).

This study aims to examine the process of adoption and adaptation of the forestry extension system in Japan and to discuss the concept of policy transfer across countries and the factors that influence policy development. The Japanese forestry extension system, which we use as an example, was introduced to Japan after World War II under the direction of the United States (US), which led the Japanese occupational government (General Headquarters [GHQ]) from 1945 to 1952. This introduction garnered the attention of forest policy makers in Japan to small-scale forestry and was an essential starting point of Japanese policy for small-scale forestry.

The remainder of the paper is structured as follows. Section 2 presents the research design and provides a review of studies on the adoption of western models in Japan and forestry advisory systems. We then present key issues that emerged from these studies. Section 3 features a description of our analyses, and Sect. 4 discusses the implications of the results.

## Research Design

### Adoption of Western Models in Japan

Historically, Japan has actively learned and adopted systems and technologies from other countries. Particularly, the Meiji period, which covers the late 19th to

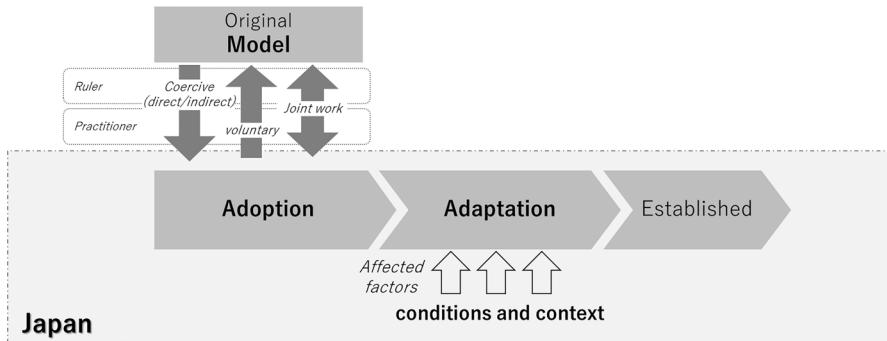
the early twentieth century, spans “one of the most remarkable social transformations of modern history” (Westney 1987, p. 1). At the time, Japan adopted numerous socio-political and economic institutions, industries, and technologies from western models (e.g., Lehmbbruch 2001; Ishikawa 2002), which laid the foundation of the modern identity of the country. One of the most remarkable features of the modernization process of Meiji Japan is the apparent voluntarism of its institutional emulation (Westney 1987). The key aspect of the emulation Westney (1987) described is that the models applied by Japan underwent a process of adoption and adaptation into the Japanese environment and not only the selection and copying of models. Foreign models served as inspiration and legitimacy for the adopted systems (Westney 1987). Later, toward the late twentieth century, the unique economic and technological development in Japan became a model for other countries (e.g., Vogel 2006).

The forestry field is no exception, and Japan has adopted various western models of which the introduction of German forestry and institutions by Meiji Japan is one of the most prominent examples. In Japan, forest conservation systems developed in various regions at least as early as their development in Germany (Totman 1998; Tokugawa Institute for the History of Forestry 2012). However, in the process of modernization, the Japanese government was more eager to introduce western knowledge and institutions instead of continuing its traditional ones (The Japan Forestry Association 2010). The next major change after the Meiji era occurred under the US-led occupation government (GHQ) after World War II. Ota (2013) pointed out that the changes in Japanese forest policy formulated during the GHQ occupation, such as the reform of national forest management, were neither simply forced by the US nor voluntarily adopted by Japan. Instead, it was a joint effort between American and Japanese foresters. For the American ones, it provided an opportunity for implementing a system that was similar to their ideals. As a result of this study, we see that a more multifaceted view of the driving force of policy transfer can be obtained if focus is directed toward persons who are committed to the implementation of a model.

## Forestry Advisory Systems

Forest advisory systems play a key role in policies related to small-scale forestry, which is frequently characterized by the lack of scientific knowledge and a diversity of motivations and goals (Harrison and Herbohn 2000; Hyttinen 2004). Communicating with such diverse forest owners and providing them with appropriate advice and necessary knowledge are important steps for achieving sustainable forest management. Building relationships between diverse policy targets and foresters is crucial in small-scale forest policy.

The relationship between forest owners and foresters in a forestry advisory system can be viewed from two aspects, namely, knowledge generation and power balance. Lawrence et al. (2020) investigated forest advisory systems in 10 European countries and identified a trend toward more democratic, participatory, and negotiated systems. They noted that European forest advisory systems

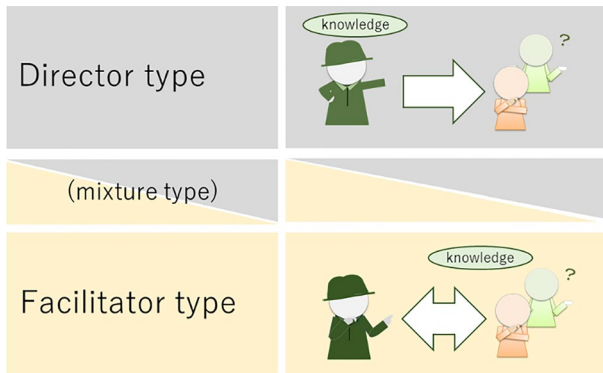


**Fig. 1** Adoption and adaptation of foreign models

consistently diverted from traditional extension based on technology transfer, and forest owners were increasingly viewed as sources of experience and participants in peer-to-peer knowledge sharing. Not only these changes in knowledge generation but also the power balance changed from top-down to more inclusive, bottom-up, and horizontal pathways through communication.

In Japan, both the public and private sectors provide forestry advice to private forest owners. In the private sector, this service is primarily provided by forest owners' cooperatives (*Shinrin-kumiai*), whereas in the public sector, this service is offered by the forestry extension staff (*Ringyō-fukyu-shokuin*) belonging to prefectural governments. Japan's administrative structure is divided into three tiers: the national government (Forestry Agency), prefectures, and municipalities. For the forestry extension system, the Forestry Agency establishes policies that are implemented by the prefectures. The position of the forestry extension staff was established after World War II, with the introduction of the forestry extension system under the direction of GHQ to provide instructions and extend forestry technology to private forest owners. This paper examines the forestry extension system through such forestry extension staff. It uses the term of “forester” to refer to professional forestry administration officials at the national and prefectural levels and “forestry extension staff” to refer to those in forestry extension positions.

Some of the prefectural foresters who pass the national government's qualification examination become forestry extension staff. This is often done as part of the 3- to 5-year personnel transfer that occurs within the forestry administration of each prefecture; therefore, after 3–5 years, many of them are transferred to non-forestry extension responsibilities. Most of them study forestry at university, but if they meet certain criteria, they may be qualified even without a university degree. As of April 1, 2022, 8,579 prefectural foresters (Ministry of Internal Affairs and Communications 2023) and 1,237 forestry extension staff were employed (current name of the title: *Ringyō-fukyu-shidōin*) (Forestry Agency 2022).



**Fig. 2** Directions of knowledge generation and power balance in forest advisory systems

### Investigation of Adoption and Adaptation in Japan

Based on previous findings, we examine the characteristics of the adoption and adaptation process of the forestry extension system in Japan and focus on the actors and drivers of the process (Fig. 1). Dolowitz and Marsh (1996) distinguished three reasons for engaging in policy transfer, namely, voluntary, direct coercive, and indirect coercive transfer. The same event, however, may appear in different forms depending on perspective. As previously noted, previous scholars pointed out that the introduction of western models by the Meiji government of Japan was characterized by its nature as a voluntary process. However, if this voluntary process is viewed as a response to a threat by the West at the time (Diamond 2019), then the policy transfer becomes an indirect coercion. Alternatively, policy transfer under the direction of the GHQ in Japan after World War II was a direct coercion under the foreign ruling system. However, as previously mentioned, the adoption process was not simply a top-down directive but a joint effort between the foresters of the two countries from the perspective of the foresters who are in charge of implementing government policies on the ground. If foresters recognized the value and usefulness of the model and positively viewed its adoption, then they committed to the implementation process more willingly. However, if they viewed it negatively, then they reluctantly and passively committed to the adoption process. Therefore, the current study aims to examine the drivers of adoption at two levels, namely, rulers and practitioners such as foresters.

The adaptation process, in which a foreign model is adjusted to suit the conditions and contexts of a country, distinctly displays the characteristics of that country. To capture the adaptation of the forestry extension system, we focus on knowledge generation and power balance. Examining the relationship between foresters and local people, such as forest owners in the forestry advisory system, the study observes two possible types of system, namely, the director type and the facilitator type (Fig. 2). In the first system, knowledge comes from foresters, which is passively received by the local people. Traditional extension based on technology transfer, as noted by Lawrence et al. (2020), is an example of this type. Conversely, in a recent

trend noted by the same authors, the main actors of knowledge generation will shift to the side of the local people, where emphasis is given to the experience of and knowledge sharing among forest owners. Here, foresters play the role of facilitators to support knowledge generation among the people.

The distinction between the director and facilitator types depends on who produces the knowledge to be extended and the degree of importance placed on the will of the target audience, such as forest owners, in the forestry extension system. Extension activities are conducted by individual extension workers in their respective fields, and the actual situation may take various forms. This paper will examine the form of the forestry extension system by focusing on what has been indicated as its basic policy, i.e., the policy at the government level. In terms of knowledge generation, if the government's policy on forestry extension states that the disseminated knowledge is to be defined by the government itself, then it is considered a director type. However, if it states that the purpose of forestry extension is to support learning by the forest owners themselves, then it is considered a facilitator type. In terms of the power balance, if the relationship is one-way, with the extension staff guiding the forest owners, then it is considered a director type; however, if the relationship is two-way with the forest owners, then it is considered a facilitator type. If the knowledge generation and power balance result in different types, then it is considered a mixed type.

As the source of information for our analysis, we used published literature, including journal articles, books, and reports containing the statements of foresters involved to investigate the adoption and adaptation process from the abovementioned viewpoints.

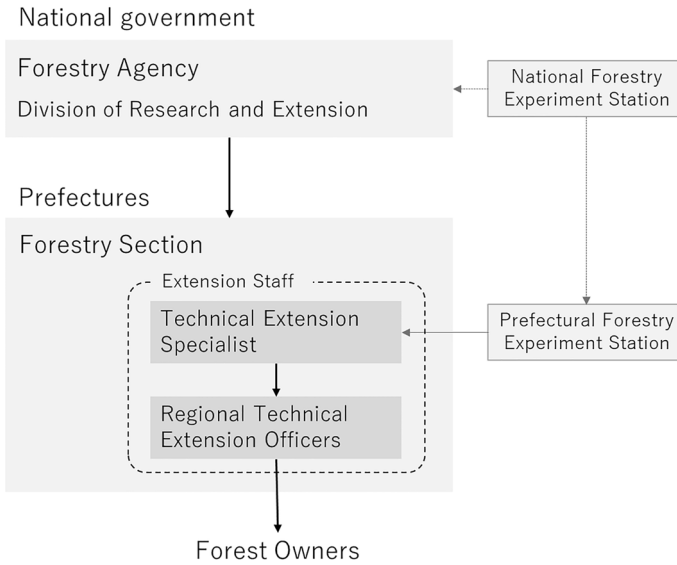
## Results

### Adoption

#### Introduction of the Forestry Extension System

The forestry extension system in Japan was introduced in 1949 under the direction of the GHQ, the General Headquarters of the Supreme Commander for the Allied Powers occupying Japan at the time, who recommended the adoption of the system. This de facto compulsory directive was unavoidable for Japan, even if it included parts that the Japanese found difficulty in understanding (Forestry Agency 1971). Although the forestry extension system was introduced after World War II, Japan had its forestry extension activities until then. At the end of the nineteenth century, itinerant forestry teachers were designated to every prefecture to teach knowledge about forestry. However, GHQ recognized that a large gap exists between excellent experimental research on forestry and the technical level of the general public in Japan and directed the establishment of a new, consistent forestry extension system similar to that of the US (Forestry Agency 1971; Hara 1959).

The entire system of forestry extension, which ranged from principles and priorities to organizational structures (Fig. 3), was introduced under the guidance of



**Fig. 3** Initial organizational structure of the forestry extension system. *Source:* Forestry Agency (1960), translated by authors

**Table 1** Regional forestry extension staff activities. *Source:* Forestry Agency (1960, 1971), translated by authors

	Adoption		Adaptation			
			First phase		Second phase	
Fiscal year of the data collection	1951		1954		1957	
Number of regional forestry extension staff	804		804		2,558	
Extension activities (hours)						
Individual instruction	372,929	54%	440,974	62%	493,070	52%
Group instruction	172,732	25%	153,767	22%	254,624	27%
Forestry consultation	76,984	11%	64,765	9%	132,481	14%
Public relations	63,624	9%	55,584	8%	62,649	7%
Total	686,269	100%	715,090	100%	942,824	100%
Other activities (hours)			5,048,134			

the GHQ. The established system was modeled after the one in the US but did not incorporate universities and was set up separately from the agricultural extension system (Hara 1978). Organization and staff were designated at the Forestry Agency in 1949 and at the prefectural level in 1950, and on-site extension activities were implemented. The target groups were forest owners and forestry-related individuals, but the extension staff first visited village after village, seeking specific targets,

needs, and methods of extension (Forestry Agency 1971). Table 1 presents the number of hours of activities spent by the regional forestry extension staff across the country, divided by type. Specifically, the forestry extension staff conducted various activities, including: “Individual instruction,” which involved visiting individual households; “Group instruction,” which was offered to groups such as forestry study groups formed by forestry households; “Forestry consultation,” which consisted of answering questions by mail or in person; and “Public relations,” which included the distribution of printed materials, slide presentations, newspaper articles, radio announcements, and forestry-related events. However, majority of these activities were devoted to “Individual instruction,” with approximately half focused on silviculture (Forestry Agency 1960).

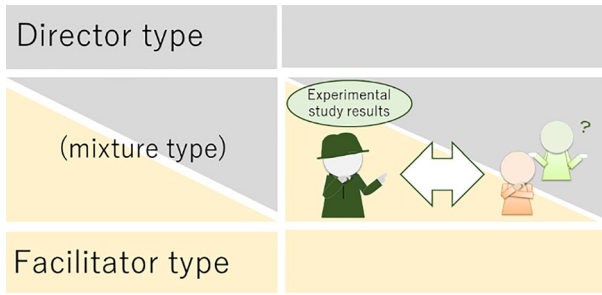
Among these initiatives, the service-oriented approach to extension entirely differed from those of conventional top-down procedures (Iwano 1950, 1955; Kami 1959). In addition, in contrast to agriculture, where the extension system was introduced earlier than that of forestry, the fact that extension officials were assigned tasks of public interest, such as regulating forestry operations alongside forestry extension, led to embarrassment for Japanese foresters; these foresters believed that the implementation of forestry extension should emphasize forest owners’ self-thinking and self-learning, distinct from the general government, which prioritizes public interest (Kamino 1984).

Although the adoption of the forestry extension system was de facto a direct coercion by the GHQ given the situation under the occupation, the Japanese foresters who were in charge of the implementation of the system at the time were very enthusiastic and active in their new work. Despite the lack of equipment and teaching materials, they worked day and night to share new forestry techniques and knowledge (Forestry Agency 1971). Hara, a bureaucrat in charge of establishing the extension system at the Forestry Agency, inferred the fact that many of the personnel employed for forestry extension were engaged in forestry in Japanese occupied territories before the end of the war. Despite high levels of technical expertise and rich experiences, they lost their jobs, which may have motivated them to take on new tasks with a new sense as forestry extension foresters (Hara 1959, 1978). The American forester named Shuley, who was in charge of the forestry extension system at the GHQ from 1947,<sup>1</sup> was also enthusiastic in his work and established a trusting relationship with Japanese foresters, according to the Japanese foresters of the time (Hara 1959, 1978; Kami 1959; Ishikawa Prefecture Extension Officers 1959). Contrary to the level of the ruler, at the level of the forester who was in charge of setting up the forestry extension system, Japanese foresters were also working willingly, and practices were based on a cooperative relationship founded on trust between the Japanese and American foresters.

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<sup>1</sup> He worked at the Economics Branch of the Forestry Division of the Natural Resources Bureau at GHQ from 1947 to 1948 and to the Production Branch (renamed the Production and Research Branch from 1949) from 1948 to 1950 (Committee for the Centennial History of the Ministry of Agriculture, Forestry and Fisheries 1981).





**Fig. 4** Initial form of the forestry extension system in Japan

However, one cannot say that the new forestry extension system was implemented without problems. Individuals engaged in the implementation of the new system frequently mentioned the difficulties and *birth pains* experienced during the implementation process (Iwano 1955; Kami 1959; Kamino 1999). In particular, the stance of providing services as helpful and friendly advisors to forest owners required considerable trial-and-error efforts to put into practice in rural areas. Although the extension staff struggled to make it work, they were sometimes met with ridicule (Kami 1959; Ishikawa Prefecture Extension Officers 1959). The poor condition of the roads to access the forest area also amplified the severity of their work (Forestry Agency 1954). In a publication commemorating the 10th anniversary of the introduction of the forestry extension system, the then-director general of the Forestry Agency, at the end of his statement, expressed his regret that 40 extension staff members died in the first 10 years of the system because of intense workload (Forestry Agency 1960). The details of these cases were not documented. However, considering that there were 1120 forestry extension staff members when the system was introduced and 3105 in 1956 (Forestry Agency 1971), when the number of staff members increased along with the expansion of duties, this is not a small number and conveys the severe effect of the intense workload at that time.

### Initial Form of the Adopted Forestry Extension System

The form of the forestry extension system initially adopted in Japan, modeled after the US system, was established in 1949 and put into practice in 1950. It was closer to the director type in terms of knowledge generation and closer to the facilitator type in terms of power balance (Fig. 4).

Particularly new to Japan at the time was the power balance perspective, which required foresters to be friendly advisors to forest owners. As previously mentioned, this point required considerable trial and error in practice. In addition, as a method of conveying knowledge, emphasis was placed on demonstration instead of the lecture format (Hara 1978). In practice, these individuals were occasionally treated as if they were dedicated laborers (Ishikawa Prefecture Extension Officers 1959).

Alternatively, the primary knowledge to be conveyed at this stage was the results of the experimental study (Forestry Agency 1971), which was provided by foresters

**Table 2** Voluntary forestry-related study groups. Voluntary forestry-related study groups include not only groups that specialize in forestry studies, but also groups such as those that are organized for agricultural research but also conduct forestry-related studies. NR denotes data not reported. *Source:* Forestry Agency (1960), translated by authors

	Number of groups		Number of members	
	Total	Forestry study groups	Total	Forestry study groups
1952	156	NR	7803	NR
1953	262	NR	11,516	NR
1954	306	NR	36,451	NR
1955	459	NR	40,557	NR
1956	769	105	48,255	1859
1957	1135	276	55,741	5161
1958	1268	310	58,646	5885

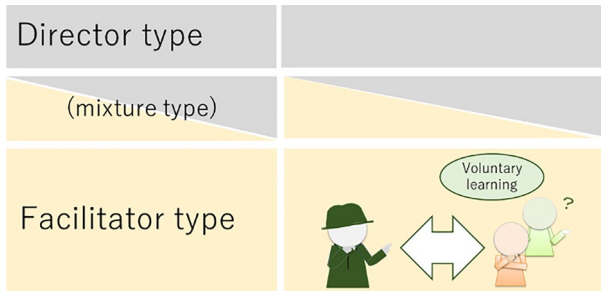
to forest owners. The aspect that differed from the past was the recognition of knowledge to be conveyed. Researchers involved in the study on forestry extension and experimental research in Japan and who inspected the situation in the US at the time emphasized the importance of aiming to develop simple and practical technology that anyone can use instead of aiming for the advancement of sophisticated technology similar to a craftsman's art, which was the case in the past (Editorial Board of Forest Technics Magazine 1950).

## Adaptation

### First Phase of Adaptation

Shortly after their adoption, Japanese foresters began to review and improve the forestry extension system. Surveys on the actual local status of forestry extension were conducted from the year after the designation of extension officers to each region, and foresters from each prefecture convened in 1952 to review and discuss the situation (Hara 1978). They also held study sessions with educational and agricultural extension specialists. As a result, an improved version of the forestry extension system was introduced in 1953 with five new guiding principles (Forestry Agency 1971). This adaptation was made by Japanese foresters engaged in forestry extension to achieve a close version of the ideal farmer-centered extension on the basis of their experience in the field.

The forestry extension slogan announced in 1953 focused on (1) introducing science to rural villages, (2) providing useful education to rural people, (3) fostering youth activities, (4) improving the lives of rural people, and (5) always playing an integral role in the testing and research institutions. These directions aimed to shift the concept of forestry extension from one in which the staff transferred superior technology to farmers to one in which the staff supported farmers' self-thinking and self-learning. Since then, the formation of voluntary forestry-related study groups, mainly among young farmers, has occurred in various regions (Table 2). The topics



**Fig. 5** Forestry extension system in the first adaptation phase

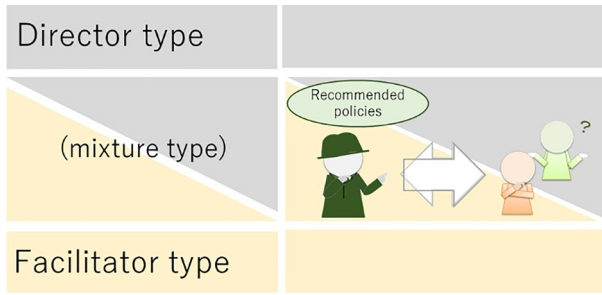
discussed by the groups have widely varied, but they initially covered the cultivation of mushrooms and seedlings.

While initial forestry extension activities generally targeted private forest owners and forestry-related individuals, the focus of this phase was clearly on farmers. At that time, rural villages had an abundant labor force, and farmers, often small-scale forest owners, were considerably interested in afforestation (Kamino 1999). These conditions may have driven the focus toward farmers.

The targeted forestry extension system in the first adaptation phase was a facilitation-type form in which farmers were considered the main actors in terms of knowledge generation and power balance (Fig. 5). As discussed previously, the announcement of this policy in 1953 does not mean that the practice in the field changed from that year; rather, the practice changed gradually through trial and error. The essence of improvement was to be based on the private interests of farmers instead of those of the public and to enable farmers to independently learn and think. Forest owners established forestry research groups for every region as a place for peer-to-peer learning. The results of experimental research and the knowledge of foresters were placed as support for such a voluntary learning process by farmers.

## Second Phase of Adaptation

Only a few years after the initiation of the first phase of adaptation, the forestry extension system was once again called on changing the course. This move was triggered as per the request of the Ministry of Finance for visible policy effects when assessing the 1956 budget (Committee for the 50th Anniversary of the Forestry Extension 1971). The objectives of forestry extension, that is, improving the private economy and support for self-learning among forest owners, were also requested to be linked to the needs of the national government. Extension foresters were expected to follow the focus of government policies at the time, such as the conversion of forest types from fuelwood to timber production forests, instead of engaging in discussions with farmers. Meanwhile, the duties of the extension staff were expanded; in other words, foresters had less time to visit forested areas and talk with owners (Forestry Agency 1971). The knowledge and experience of foresters declined as



**Fig. 6** Forestry extension system in the second adaptation phase

experienced foresters moved out and were replaced by inexperienced ones (Forestry Agency 1971). In Japan, it is still common for forestry administrative personnel, including forestry extension staff, to be transferred every few years, and similar personnel movements are considered to have occurred at that time.

Over time, many forest owners gradually lost interest in their forests due to the long-term slump in the Japanese forestry industry. The number of staff in charge of forestry extension and the amount of their budgets were also reduced. The forester in charge of forestry extension did not create these changes; instead, such changes were compelled at the initial stage by government policies requested during the budget review process and at the later stage by the socio-economic conditions related to the forestry industry.

The organizational structure of the forestry extension shown in Fig. 3 has been carried over in a largely similar form to the present. However, there has been a significant expansion in terms of the target groups for extension activities. Forestry extension activities, which had targeted farmers, gradually broadened their focus to include heirs of forest owners, forest owners' cooperatives, and the general public. In the late 1990s, the government transferred some administrative authority over private forests from the prefectures to the municipalities as part of its decentralization policy. As municipalities usually did not have a forester, and forest administration is managed by staff with little forestry knowledge, the prefectural forester provided various types of support to the municipal forest administration in most prefectures. These municipal forest administrators are now the main targets of forestry extension activities.

The forestry extension system in the second adaptation phase shifted again to a director-type form in that it focused on implementation of government recommended policies (Fig. 6). Although this policy change was announced in 1956, as noted above, this does not mean that the ideas of the previous two phases have been expunged, and despite changes in government policies on forestry extension since then, various practices have continued in the field of extension activities. The forestry extension staff continued to act as advisors to forest owners and to support the voluntary efforts of owners. In 1983, there were 2,471 voluntary forestry study groups with 48,835 members (Forestry Agency 1984). The activities of these groups have greatly varied, extending beyond the acquisition of forestry skills and

knowledge to include the provision of educational programs for children and students, interactions with urban citizens' groups, and the maintenance of nature trails. However, by 2008, the number of groups registered as forestry study groups was 1,480 with 28,043 members, indicating a decline over the past 25 years (Fiftieth Anniversary Committee of the National Forestry Study Group Liaison Council 2009). According to the results of a survey conducted on 495 forestry study groups in the same year (Sekioka 2012), majority were established between the 1970s and the early 2000s. The strongest trigger for establishing a group, cited by the majority of the groups (52%), was the recommendation of forestry extension staff.

Kamino, who conducted research on the forestry extension system for many years since the adoption of the system, identified 13 roles<sup>2</sup> of the extension staff in the development of the local forestry. These roles included providing technical guidance, facilitating independent research activities by owners, communicating policy information, planning projects, and coordinating the interests of all parties involved (Kamino 1999). In addition, foresters were expected to play roles that exceed those in forestry development, such as educating the general public and promoting consensus building regarding forestry, in the region.

The characteristics of the forestry extension system in the second adaptation phase have been basically upheld until today. During this period, a large discussion was conducted on foresters. Their role became the focus of attention. In 2009, the Ministry of Agriculture, Forestry, and Fisheries announced a plan to train new foresters in Japan modeled after the *European Foresters* image that was formed in Japan, in reference to Germany, Finland, and Austria, to revitalize the Japanese forestry industry. This plan was a new policy initiative by the Democratic Party of Japan, which was newly in power at the time. The ideal *European Foresters* envisioned at the time (Forest and Forestry Basic Policy Review Committee 2010) exhibited characteristics similar to the initial form of extension foresters adopted under the direction of the GHQ. However, the extension staff was not recognized as a *European Forester* type in this discussion. In the end, the ideal *European Forester* was not implemented in this form in Japan. Nevertheless, discussion brought a significant change in the manner that the human resource development for foresters (although it did not explicitly include the extension staff) became one of the central issues in forest policy in Japan.

The above discussion indicates that forestry extension personnel have not received sufficient recognition at the government-level in recent years. This may be

<sup>2</sup> From a case study of forestry research group activities of forest owners, Kamino highlighted the following 13 roles of forestry extension staff: (1) "initiator," triggering the establishment of the research group; (2) "instructor" for teaching new technologies; (3) "consultant" for the management of the research group; (4) "sales person" to increase the amount of work commissioned to the research group; (5) "person who paves the way" to persuade stakeholders; (6) "mediator" with university researchers; (7) "lecturer" to deliver the technology to the field; (8) "certifier" of trainees' acquisition of technology in the workshop; (9) "judge" to evaluate the results of field application; (10) "planner" for events related to forestry extension; (11) "communicator" between the field and the government; (12) "coordinator" between the field and the government; and (13) "brain" for the government to resolve administrative issues.

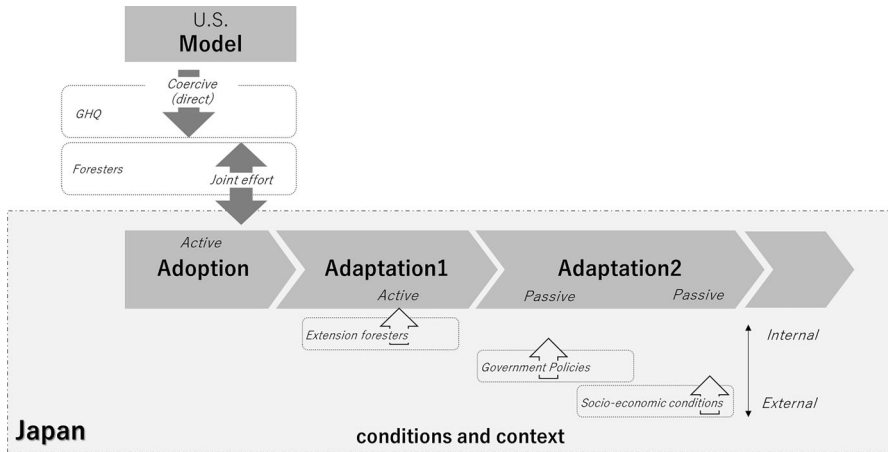


Fig. 7 Adoption and adaptation of the forestry extension system in Japan

attributed to the custom of frequent personnel transfer and ambiguity of targets and roles; in many cases, the lack of personnel relative to the workload has also prevented them from conducting extension activities to diverse extension targets in a way that works for them. Future research should provide an empirical examination of the last point.

## Discussion

Figure 7 depicts the characteristics of the adoption and adaptation of the forestry extension system in Japan. The adoption of the system in Japan itself was, in effect, a direct coercion by the ruling GHQ. However, the American and Japanese foresters in charge of the implementation of the system were highly enthusiastic about the work and they worked willingly to put the new system into practice. Therefore, among foresters as practitioners, this was more of a voluntary joint effort. This enthusiasm of the Japanese foresters continued after the end of the occupation, and further efforts were made to achieve the idealized form they envisioned. The first phase of the adaptation was a voluntary endeavor by Japanese foresters at the practitioner level. Eventually, however, the purpose of forestry extension shifted to contributing to the realization of policies prioritized by the government as required through budget assessments. Extension officers spent less time talking to local forest owners, which was accelerated by the socio-economic conditions related to the forestry business. This was the second phase of adaptation. These changes, from the practitioner level, can be understood as having been forced from the outside or from the top. As a result, the role of forestry extension and the extension staff became less recognized, and in 2009, training foresters similar to the initial form was back on the agenda.

In the same way that adoption can be divided into the levels of rulers and practitioners, adaptation also can be divided into internal improvement by practitioners and external influences. Improvements made by foresters based on their practices exerted a different impact on the forestry extension system compared with changes brought about by requests from higher levels, such as budget assessors, or changes in response to external circumstances such as socio-economic conditions. Changes due to external requirements do not necessarily improve the quality of the forestry extension system and can oftentimes hinder improvement.

Regarding changes in the forestry extension system in Japan, the initial form was a facilitator type in terms of power balance and closer to a director type in terms of knowledge generation with a mixture of both types. In the first stage of adaptation, this form was aimed at the facilitator type, which also included the knowledge generation perspective. In the second stage of adaptation, however, the knowledge generation perspective shifted again to the director type. Although the form appears to have moved closer to the director type in terms of power balance, it has, in fact, continued to play a facilitator role as well.

Considering the trend in forestry advisory systems in European countries from the director to the facilitator type as the direction of the “development” of forestry advisory systems, as discussed in Sect. 2, we can describe the forestry extension system in Japan as follows. The initial forestry extension system adopted during the occupation depicted the character of traditional technology transfer but aimed at a horizontal relationship through communication with forest owners. It was at the very early stages of development of forestry advisory systems that the power balance between actors began to form. Only a few years after its introduction, during the first phase of the adaptation in the 1950s, the Japanese foresters were aiming for a form similar to the current system. However, the second phase of the adaptation as early as after the late 1950s can be seen as a swing back under the influence of government policies and socio-economic conditions related to the forestry industry in Japan.

The improvements by Japanese foresters in the 1950s can be regarded as a very progressive development that took place soon after the system was introduced. This can be viewed as an innovation that the Japanese foresters, inspired by their joint effort with an American forester during the adoption phase, initiated after the occupation. At least until the mid-1950s, forestry extension foresters were able to construct a system based on forestry extension principles legitimized through the adoption of a foreign system under the direction of the GHQ. The progressiveness of the 1950s can be viewed as having been achieved, because allowance was given for Japanese foresters to nurture their desire for the work and to innovate as per their initiative under this legitimacy. However, this practitioner-led development did not last long, and soon forced a retreat from it. In this sense, such legitimacy had certain limitations.

The results imply the following points. First, policy development occurs at both the ruler and practitioner levels, and examining the significance and effectiveness of policy transfers and the adaptation of adopted institutions at each level are important aspects. Second, foreign institutional models can provide inspiration and legitimacy

and generate progressive innovation, but key to this is the motivation and perception of practitioners toward their work and room for voluntary initiatives given to them.

**Acknowledgements** This work was supported by the Grants-in-Aid for Scientific Research (KAKENHI) by the Japan Society for the Promotion of Science (grant Number: JP 22H03847).

**Author Contributions** Both authors contributed to the concept and design of this research. IR analyzed the secondary literature and wrote the first draft of the manuscript. HGM provided parts of the literature review, revisions and comments. Both authors read and approved the final manuscript.

## Declarations

**Conflict of interest** The authors declare no conflict of interest.

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## References

- Committee for the 50th Anniversary of the Forestry Extension (ed) (1971) 50 years of forestry extension: 50th anniversary of forestry extension (林業普及50年: 林業普及指導事業50周年記念誌). Committee for the 50th Anniversary of the Forestry Extension, Tokyo (*in Japanese*)
- Committee for the Centennial History of the Ministry of Agriculture, Forestry and Fisheries (1981) Centennial history of the Ministry of agriculture, forestry and fisheries (農林水産省百年史). Forestry and Fisheries Centennial History Publication Society, Tokyo (*in Japanese*)
- Diamond J (2019) Upheaval: How nations cope with crisis and change. Penguin, London
- Dolowitz D, Marsh D (1996) Who learns what from whom: a review of the policy transfer literature. *Pol Stud* 44:343–357
- Editorial (1950) Round-table discussion: talking about forestry in the U.S. (1) (アメリカの林業を語る(1)). *Forest Technics* 107:21–30 (*in Japanese*)
- Fiftieth Anniversary Committee of the National Forestry Study Group Liaison Council (2009) 50 Years of ZENRINKEN (全林研50年の歩み). National Forestry Study Group Liaison Council (ZENRINKEN), Tokyo (*in Japanese*)
- Forest and Forestry Basic Policy Review Committee (2010) The 2nd forest and forestry basic policy review committee: Minutes (第2回 森林・林業基本政策検討委員会: 議事録). <https://www.rinya.maff.go.jp/j/kikaku/saisei/pdf/2gjiroku.pdf>, Accessed 14 March 2023 (*in Japanese*)
- Forestry Agency (1984) Fostering forestry research groups (林業研究グループの育成). *Rinya-Jihou* 31(4):5–9 (*in Japanese*)
- Forestry Agency (ed) (1971) Forestry extension (20th anniversary): Progress and new directions (林業普及(20周年記念): 普及のあゆみと新しい方向を求めて). Forestry Agency, Tokyo (*in Japanese*)
- Forestry Agency (ed) (1954) From diaries of extension officers (普及員の日記から). Forestry Agency, Tokyo (*in Japanese*)
- Forestry Agency (ed) (1960) Commemorating the tenth anniversary of the forestry extension service: Progress in extension (林業改良普及事業十周年記念 普及のあゆみ). Zenrinkyou, Tokyo (*in Japanese*)



- Forestry Agency (ed) (2022) Handbook of forest and forestry statistics 2022 (森林・林業統計要覧 2022). Forestry Agency, Tokyo (*in Japanese*)
- Hara C (1959) From technological extension to educational extension: a decade of forestry extension services (技術普及から教育的普及へ: 林業改良普及事業の十年の歩み). *Forest Technics* 896:2–5 (*in Japanese*)
- Hara C (1978) Establishment of forestry extension system (林業普及制度の創設). In: Rinseisou-goukyougikai (ed) The history of postwar forestry transmitted to the next generation: Second series (続・語りつく戦後林政史). J-FIC, Tokyo, pp 7–29 (*in Japanese*)
- Harrison SR, Herbohn JL (2000) The role of small-scale forestry throughout the world. In: Harrison SR, Herbohn JL, Herbohn KF (eds) Sustainable small-scale forestry. Edward Elgar Publishing, Cheltenham, pp 3–13
- Harrison S, Herbohn J, Niskanen A (2002) Non-industrial, smallholder, small-scale and family forestry: What's in a name? Small-Scale for 1:1–11. <https://doi.org/10.1007/s11842-002-0001-3>
- Hatcher JE, Straka TJ, Greene JL (2013) The size of forest holding/parcelization problem in forestry: a literature review. *Resources* 2:39–57. <https://doi.org/10.3390/resources2020039>
- Hölzl R (2010) Historicizing sustainability: German scientific forestry in the eighteenth and nineteenth centuries. *Sci as Cult* 19:431–460. <https://doi.org/10.1080/09505431.2010.519866>
- Hyttinen P (2004) Small-scale forestry. In: Burley J, Evans J, Youngquist J (eds) Encyclopedia of forest sciences. Elsevier, Amsterdam, pp 663–666
- Ishikawa A (2002) Modernization: westernization vs. nationalism—a historical overview of the Japanese case. *Dev Soc* 31:281–288
- Ishikawa Prefecture Extension Officers (1959) Celebrating the tenth anniversary of the forestry extension service: a roundtable discussion (林業改良普及事業十周年を迎えて: 座談会). *Sanrin* 902:34–39 (*in Japanese*)
- Iwano M (1950) Research and extension of forestry technology (林業技術の研究普及事業). *Sanrin* 791:14–18 (*in Japanese*)
- Iwano M (1955) Establishment of research extension system (研究普及体制の確立). *Sanrin* 858:41–43 (*in Japanese*)
- Japan Forestry Association ed. (2010) The establishment and development of forestry in the pioneer period (草創期における林学の成立と展開). Agriculture, Forestry and Fisheries Promotion Association, Tokyo (*in Japanese*)
- Kami K (1959) How was the forestry extension received? (林業の改良普及はどのように受けとられたか). *Sanrin* 897:27–34 (*in Japanese*)
- Kamino S (1984) A locus and a problem of the forestry extension system. *Forest Economic* 424:1–9 (*in Japanese*)
- Kamino S (1999) Forestry extension 50 years of extension: retrospect and expectations (2) the role of extension in the development of production areas (林業普及普及50年・回顧と期待 (2) 産地形成に果たした普及事業の役割). *Gendai Ringyou* 398:42–45 (*in Japanese*)
- Lawrence A, Deuffic P, Hujala T, Nichiforel L, Feliciano D, Jodlowski K, Lind T, Marchal D, Talkkari A, Teder M, Vilkriste L, Wilhelmsson E (2020) Extension, advice and knowledge systems for private forestry: understanding diversity and change across Europe. *Land Use Policy* 94:1–14. <https://doi.org/10.1016/j.landusepol.2020.104522>
- Lehmbruch G (2001) The institutional embedding of market economies: The German “model” and its impact on Japan. In: Streeck W and Yamamura K (eds) The origins of nonliberal capitalism: Germany and Japan in comparison, Cornell University Press, Ithaca and London
- Ministry of Internal Affairs and Communications (2023) Local government capacity management survey results (地方公共団体定員管理調査結果). Ministry of Internal Affairs and Communications, Tokyo (*in Japanese*)
- Mizuno S (2022) Hybridity of colonial and postcolonial forestry in environmental history: an introduction. *Int Rev Environ Hist* 8:129–134. <https://doi.org/10.22459/IREH.08.02.2022.07>
- Ota I (2013) Resourcalization of forests and U.S. influence on postwar forestry policy (森林の資源化と戦後林政へのアメリカの影響). In: Noda K. (ed) A century of agricultural and forestry resource development: A comparative history of “resourcalization” and total war regimes (農林資源開発の世紀: 「資源化」と総力戦体制の比較史). Kyoto University Press, Kyoto (*in Japanese*)
- Pachova NI, Tikkanen I, Pajari B, Nevenic R (2004) Introduction: capacity needs for forest policy development in countries with economies in transition. In: Jansky L, Nevenic R, Tikkanen I,

- Pajari B (eds) Challenges in strengthening of capacities for forest policy development in countries with economies in transition. United Nations University, Hong Kong, pp 1–16
- Schraml U (2004) Rise and fall of programmatic approaches in German small-scale forest owner research. In: International symposium on contributions of family-farm enterprises to sustainable rural development, proceedings, Freiburger Forstliche Forschung, Berichte, Heft 51, Freiburg
- Scott JC (1998) Seeing like a state: How certain schemes to improve the human condition have failed. Yale University Press, New Haven
- Sekioka H (2012) The present situation and problems of forestry study group in practicing forest education. *J Agric Sci* 57(3):175–184 (*in Japanese*)
- Tokugawa Institute for the History of Forestry (ed) Edo Studies of forests (森林の江戸学). Tokyodoshuppan, Tokyo (*in Japanese*)
- Totman CD (1998) The green archipelago: forestry in preindustrial Japan. Ohio University Press, Athens
- Ubukata F (2021) Bringing science to the forest: Scientific forestry and forest management and its localization (森に科学を導入する: 科学的林業・森林管理とその現地化), In: Ubukata F (ed) Forests in the making: Changing phases of human-nature hybrids (森のつくられかた: 移りゆく人間と自然のハイブリッド). Kyoritsu Shuppan, Tokyo, pp 96–118 (*in Japanese*)
- Vogel SK (2006) Japan remodeled. Cornell University, Ithaca and New York, How government and industry are reforming Japanese capitalism
- Westney DE (1987) Imitation and innovation. Harvard University Press, Cambridge, The transfer of western organizational patterns to Meiji Japan

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