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Revitalization of Rice Terrace Area through Urban-Rural Exchange Design Approach in Oyama Senmaida, Kamogawa, Japan

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ABSTRACT

Since 1960, the area of rice terraces in Japan has begun to decrease drastically due to a lack of human resources. Oyama Senmaida is a rice terrace area that successfully managed a revitalization program through an urban-rural exchange approach and was included among Japan's 100 top rice terraces. Based on the achievements of this organization, this research was carried out to understand development patterns from the design development aspect to the evaluation of programs through direct interviews with staff at Oyama Senmaida and surveys from the activities held. From the results of this research, it can be concluded that the revitalization design strategies carried out by Oyama Senmaida include raising the foundation of design ideas through local and external potential and dividing activity programs into preservation and new program development. Regarding program details, there are three categories of activities, namely ownership and trust, workshops and experience, and other programs. In the context of evaluation, supporting elements in producing a sustainable revitalization program, including building internal and external cooperation networks; planning income and funds from the government or private sector for development; and targeting market participants in the surrounding area and building aspects of publication through newspapers and online media.

1. INTRODUCTION

Japan is a rice-producing country, with a total production of 10,525,400 tons of rice (Food and Agriculture Organization, 2022), with a five-year average harvested area being 1.5 million hectares (Mita, 2023). Rice is a summer crop that is cultivated starting with nurseries in March, planting in the field in May, and harvesting between September and November, grown over most of Japan, including Tohoku, Kanto, Chubu, and Hokkaido (Gonocruz et al., 2021). The ride varieties produced include Japonica, short-grain rice, and Koshihikari, the most popular variety to be grown (Tomita & Tokuyama, 2022).

There are two types of rice fields in Japan, namely flat rice fields, or *hirachi suiden*, and terraced rice fields or *tanada*. Rice terraces are an important component of the *satoyama*, or traditional Japanese cultural landscape. *Satoyama* landscapes are a mosaic-shaped landscape consisting of ecosystems, including paddy fields, dry fields, woodlands, grasslands, irrigation canals, etc (Takeuchi et al., 2016). This landscape has been sustainably cultivated with a variety of ecological and social environments and has high value as a local resource with various types of benefits (Fukamachi, 2017). With the diverse topographical characteristics, there are many rice terraces in mountainous areas for the purpose of increasing yield to the maximum as an effort to secure efficient agriculture production. In recent years, rice terraces have also been appreciated as part of the beauty of the natural scenery in Japan (Ushijima et al., 2016). The word "*tanada*" themselves were historically first discovered in 1336, and this method of rice cultivation in mountainous areas has been used in Japan since ancient times (Kikuchi et al., 2019). According to the Ministry of Agriculture, Forestry and Fisheries (MAFF), *tanada* can be defined as follows: "a small plot of terraced rice fields with an average slope of one-twentieth or more."

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Rice terraces cover 221,000 hectares, which is approximately 8% of the area of rice paddies in Japan (Kobayashi & Harada, 2010). These terraces are spread over almost all of Japan except Tokyo, Saitama, and Okinawa, with 54,000 different locations (Nakajima, 1996). Rice terraces has become an important component in satoyama landscapes, which have been defined as cultural landscapes consisting of rural communities and their surrounding secondary environments or as socio-ecological production landscapes and seascapes in Japan.

Despite the potential for agriculture, tradition, and scenery, since 1960, many farms have been abandoned in Japan, leading to the loss of agricultural landscapes (Maiko, 2019). There are various reasons for this shift, including that, in rural areas, local businesses and industries continue to decline, providing fewer job opportunities, causing people to move to cities (Kato, 2014). Due to declining birth-rates and an increasing elderly population, depopulation is also a major threat to the survival of these farming villages. Based on United Nations (2021) data, the percentage of people aged 65 years or older is 29.8% of the total population, making Japan the country with the oldest population in the world (United Nations, 2023). The high cost of labour in the agricultural sector also leads to high production costs, coupled with the decline in rice consumption, resulting in a decline in income from the agricultural sector and the consequent migration of young people to the cities (Kieninger et al., 2013).

Rice terraces have a small cultivation area, making it difficult to use large farm machinery. Due to the inconsistent topography, yields in rice terrace areas are low despite the large amount of labour involved. Therefore, it is difficult to maintain and manage rice terrace in mountainous areas (Tsuchiya et al., 2021). The acreage reduction policy that began in the 1970s also spurred the abandonment of rice terrace cultivation (Asada, 2009). According to the Foreign Agricultural Services (FAS) Tokyo and MAFF cropping intention surveys, rice production in 2023-24 has declined as many farmers have chosen to increase the cultivation of wheat, barley, and soybeans.

Since 1990, rice terraces have been considered a cultural representative related to landscapes in Japan, and there are various revitalization programs such as multi-stakeholder activities that have been carried out throughout Japan to reduce abandoned rice terraces (Chen et al., 2016). Rice terrace landscape conservation and activities have also been initiated through yearly summits held by Professor Minehiro Nakajima through the Tanada Network program to strengthen the local economy. The first rice terrace summit was held in Yusuhara City, Kochi Prefecture in 1995 and is hosted at different rice terrace location (Wang et al., 2024). Through the program, Nakajima became the first person to advocate for the terrace rice field ownership system.

The rice terrace ownership system is a land tenure system, where non-farmer volunteers or "tenants," the majority of whom are city residents, rent a piece of land in rice terrace for a fee and cultivate it under the guidance of the landowner or other experienced supervisors from the local population (Ministry of Agriculture, 2008). The ownership system may recruit farmers from among retirees living on pensions, weekend farmers, and urban residents who volunteer. In addition to the ownership system, on 26th July 1999, MAFF also supported rice terrace conservation activities through a national award for the 100 most beautiful rice terraces in Japan after evaluating the environmental conservation effects on the inheritance of rural culture (Ishida, 2013). This award is given by the government in order to increase popularity and encourage the public to become involved in ride terrace protection or support the implementation of the Tanada Ownership System.

Compared to other districts, Oyama Senmaida has a more common ownership system regarding the management body, cost, content of owner participation, and frequent involvement (Makiyama et al., 2002). Before the ownership system was introduced, the land was cultivated by elderly farmers in their late 60s to 70s, and depending on the circumstances of the farmers, there were cases of crop failure or abandonment (Yamamoto et al., 2001). This is a significant problem related to the existence of the Oyama Senmaida area and its agricultural activities; therefore, as a revitalization effort, since the early 1990s, residents in the surrounding area have formed associations for the production, processing, and shipping of regional specialties, as well as organization to accept agricultural experiences from urban residents to expand sales channels. Based on these activities, the "Kamogawa City Refresh Village Project" was started in 1996 under the Ministry of Agriculture, Forestry and Fisheries' structural improvement project to revitalize local agriculture through agriculture product sales and experiential exchanges. A council was established to develop base facilities such as "*Minaminosato*" and promote the project. As a centerpiece for promotional exchange, the Oyama Senmaida Preservation Society *(Oyama Senmaida Hozon-kai*) was established on 30th October 1997, and has succeeded in continuously increasing community interest in local activities in the Oyama area.

Oyama Senmaida is located in the area of the highest mountain in Chiba Prefecture, Mount Oyama, which has a height of 1,252 m and located in Kamogawa City in the south-eastern part of Chiba Prefecture,

where the area is 191 km^2, and a population of 35,000 people (Figure 1). This traditional terraced rice field landscape spans 3.2 ha amidst the hills of the Boso peninsula, approximately 15 km west of Kamogawa City and 100 km southeast of Tokyo. The area is also certified by MAFF as the only place in Japan where rice is grown solely with rainwater, known as *tensuiden* (Kyoko, 2020).

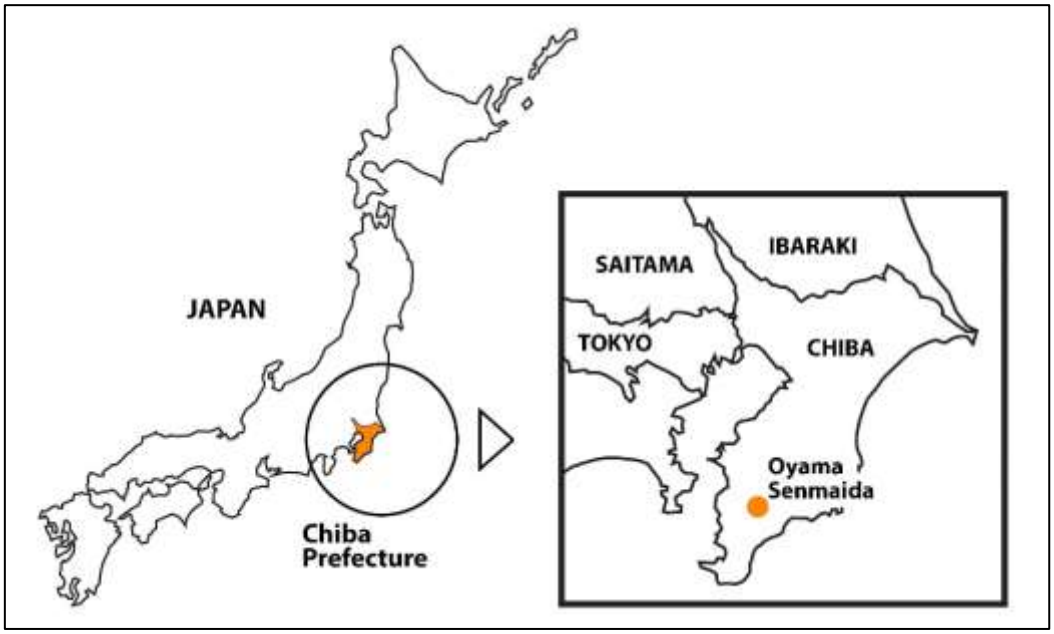

Figure 1. Location of Oyama Senmaida

In terms of the ownership system, the Oyama Senmaida Preservation Society has succeeded in increasing the interest of urban communities in renting farmland, which may be seen from the participants of 20 groups in 1997 growing to a total of 162 groups in 2023. With the development of activities and support from various elements, the organization became a non-profit organization (NPO) in 2003 to be able to achieve even higher goals while being responsible to society. Activities to date have also developed not only within the scope of rice farming, but also in the development of natural potential and local culture with the collaboration of various stakeholders. In terms of tourism, Oyama Senmaida also managed to bring in more than 10,000 tourists in 2011 and continues to grow in number. Due to the success of its revitalization program, in 2010, the emperor visited the area.

This success was achieved based on the design of various activity programs, both preservation and development of new programs created through urban-rural exchange collaboration. This research was conducted to understand the pattern of program development from the initial stages, namely design development and detailed program implementation, to analysis of evaluation aspects related to problems and sustainability. Therefore, from the results of the analysis, apart from being able to become a reference for development patterns in agricultural areas with similar situations, it can also be obtained the problems that Oyama Senmaida is still facing today as a reference for future improvement for revitalization activities.

2. METHOD

In conducting the research, the data collection method used was a direct interview with Oyama Senmaida staff and a direct survey of activities in the field in October 2023. In the analysis process, there are three categories; the first is to understand the design development stage, where the focus is on the design approach of activities carried out when implementing the urban-rural method, the main foundation which becomes the leading guide in design development, and what considerations are used in the process both locally and externally. Next, the detailed aspects of the program carried out at Oyama Senmaida, where the scope includes understanding the implementation of activities for preservation and new program developments, will be analyzed. The categorization of activities is done to understand what types of activities are designed and how season-based activity scheduling patterns exist in Japan. The last stage is to conduct an evaluation-based analysis of the activities carried out in terms of sustainability, the number of interests in the activity program, and what obstacles are faced both in the short and long term therefore hypotheses can be made related to recommended solutions to these problems (Figure 2).

Figure 2. Research flow from the Oyama Senmaida program

3. RESULTS AND DISCUSSION

The Oyama Senmaida Preservation Society was founded with the realization that, in the future, no one would live in that area, meaning that the amount of abandoned farmland would increase because there were no farmers to manage or maintain the area. Community members realized that the community would lose its vitality, which is why this organization exists. At first, inspiration came not from the initiating team, but from a local photographer who suggested that it would be an interesting idea if this rice field area were used and developed. From there, the revitalization program began in an area with 375 rice terraces that was eventually named Oyama Senmaida with the intention of making it an icon of the area.

At the beginning of the program's inception, the local community was still sceptical of the agricultural revitalization and rented out farming areas to outsiders because they thought that they could do their own activities. Not all of these individuals are still actively engaged in agricultural activities. Moreover, in the Kamogawa area, many people are doing business outside of rice farming, which is economically more profitable. Eventually, the remaining farm owners said that, "we can't do it anymore because we are old and need your help." In addition, these farmers think that it will be more enjoyable to work on the farm with the owner system because many outsiders will come to work. Therefore, through motivated support from the local community, the organization is working to restore the previously abandoned rice fields and improve Senmaida's landscape as a local cultural heritage site.

Rice terraces are slopes comprised of stairs that may be used in high embankments or excavations and serve to increase slope stability, facilitate maintenance, extend the water catchment area, shorten the length of the slope and/or reduce the slope, reduce the speed of surface water flow, and be used for landscaping (Pramudo et al., 2016). Therefore, technically, there are various obstacles in cultivating rice in the area due to the inconsistent shape of the area, making it difficult for farmers to use large agricultural machinery. Therefore, support from the city is needed in the rice terrace revitalization program, inviting them to be part of the labour force. Against this background, the program design approach is a 'urban-rural exchange,' having the ownership system approach as the beginning of village revitalization activities, with the main goal of people having discoveries and enjoying and getting used to activities. Various development ideas to date have been designed based on an urban-rural collaborative approach with the categorization of activities carried out with ownership system programs such as rice terrace ownership, sake production ownership, rice terrace trust, soybean field trust, and cotton indigo dyeing trust, for workshop and experience programs such as the study of renovation of old houses, activity of food education or *shokuiku*, rice straw craft or *warazaiku* workshop, and study through nature. In addition, there are light up festival activities, *satomai* dance performances, and a photo contest (Figure 3).

Figure 3. Activity categories at Oyama Senmaida

Rice terrace ownership

This program involves inviting urban community to rent rice fields with an area of 100m^2 each. This activity is targeted at urban communities in the Chiba Prefecture or Tokyo area located close to the Oyama Senmaida area to guarantee sustainability. In its agricultural activities, the program works collaboratively with local farmers through a schedule of seven-time participation during the planting period of a year with traditional Japanese planting methods, starting from planting rice during the golden week or four-day holiday in Japan, mowing the grass (June, July, and August), harvesting rice, and drying rice using the *hasakage* method by using bamboo to hang it under the sunlight outdoors (Purwandaru, 2023), threshing the rice, and harvest festival (August and September). The crops from this program are distributed to the land tenants; by 2023, the total members of this activity reached 136 groups. There are three types of members in the ownership program: (1) those who only want to participate in one of the farming activities (e.g., during planting); (2) those who follow planting to harvesting or the entire farming process; and (3) those who only provide financial support or even provide the harvest.

Sake production ownership

This program is an ownership system for activities ranging from rice cultivation in an area of 3,000 m^2 to the production of sake or a fermented traditional alcoholic beverage that converts the starch in rice into sugar, which is converted into ethanol by sake yeast. The rice planted in this activity is Koshihikari or an early variety that can be planted one week earlier than rice in general so that the harvest is done at a different time from the rice terrace ownership program. This program starts with planting rice, mowing grass, harvesting rice, and using the harvested rice for sake production at a local sake company. The sake produced has an original local brand label, and each member is given up to three bottles, each containing 1800 ml. To date, total membership has reached 220 units. From this program, there is a cooperation with a local cup maker company that provide cups for sake drinking activities (Figure 4).

Figure 4. Oyama Senmaida rice terrace ownership (left) and sake production ownership programs (right) (source: Oyama Senmaida Preservation Society, 2023)

Rice terrace trust

The rice terrace program implemented sin 2002 is similar to the ownership system. Activities are carried out from planting rice to harvesting by working under the supervision of local farmers. Farm work is done collaboratively with a dynamic schedule. In the trust system, farm work is done as a joint activity where participation is a right, and the harvest is distributed evenly depending on the number of participants and whether they are looking for a bountiful harvest or not. This program provides a rice field area per unit of approximately 100 m^2 with a total unit area offered until 2023 of 73 units.

Soybean field trust

This program started in 2001 with the aim of reducing abandoned farmland to the largest extent possible and protecting the natural landscape in the mountainous area of the Kamogawa river. Soybean field trust activities are carried out through urban-rural collaboration to preserve the rural landscape and soybean-based Japanese food culture. In this program, the activities include experiencing cultivating soybean from sowing to harvesting in an area of 33 m^2 per unit, as well as post-harvest activities such as making tofu and miso or pasta derived from soybeans and grains with Koji enzymes and beneficial microbes (Onda et al., 2003). Until 2023, the members of this activity had reached 66 rented units covering an area of 2000 m^2.

Cotton and indigo dyeing trust

The program uses idle farmland in Oyama Senmaida by cultivating cotton and indigo through a collaborative approach with urban-rural participants. The motivation for this program is that there is no

culture of cultivating and processing cotton in this region, and clothing is a basic element for human life. This program also teaches people to understand the process of making clothes for themselves through cultivating and collecting raw materials from nature directly. In this "trust" program, the activities carried out are the experience of growing and cultivating of cotton and indigo, harvesting the natural materials, and processing these materials with spinning, weaving, and indigo dyeing methods. The outputs of this activity include producing organic cotton, spun yarn, cotton-based artworks, and indigo natural dyes. This activity is carried out through six activities per year, and there is future development by creating other dye programs from nature besides indigo (Figure 5).

Figure 5. Oyama Senmaida soybean field trust (left), and cotton and indigo dyeing trust (right) (source: Oyama Senmaida Preservation Society, 2023)

Study of renovation of old house

This program was implemented because many traditional houses in the Oyama Senmaida area are not maintained or even abandoned due to the decreasing rural population, which has become a national problem in Japan (Ochiai, 2023). The traditional house is both a tangible and intangible heritage asset for Oyama Senmaida because it is physically a historical relic and, in its production techniques, is unique both in terms of technique and value. Therefore, this program is designed to teach traditional architectural techniques through renovating old houses by focusing on the use of local building materials and aims to preserve traditional techniques, revive forestry, revitalize *satoyama*, and promote the restoration of private houses. In this program, members learn the value of domestic lumber and traditional carpenters in processing wood to renovate houses, as well as roofing methods, *takekomai* methods, or the use of bamboo-reinforced structures most commonly for earthen wall bases or substrate materials as bamboo grids for traditional wooden building (Kerta, 2022). In its implementation, the program implements two workshop approaches, namely classes and practice 10 times a year, with a total of 113 participants as of 2023.

Figure 6. Study of renovation of old house (A), food education (B), rice straw craft workshop (C), and study through nature activity (D) (source: Oyama Senmaida Preservation Society, 2023)

Food education activity (*shokuiku*)

This program is designed to educate the post-harvest stage of farming in Oyama Senmaida through workshops of traditional styles of making tofu, miso, mochi pounding, and sushi making. In Chiba Prefecture, there is a traditional sushi called *futomaki matsuri zushi*, which is made especially for celebratory events

and is characterized by its cross-section of flowers, animals, or lucky symbols (Gilhooly, 2017). In this food culture program, traditional foods are made, and participants are invited to experience the traditional style of home party with locals. This program works with female collaborators from the local community to provide meals and prepare various ingredients.

Rice straw craft (*warazaiku*)

This activity is based on local community's awareness of the unutilized post-harvest rice straw material in Oyama Senmaida, which is part of the implementation of the Japanese *mottainai* culture. This word contains a meaning that can be interpreted in two ways, either as the awareness of leaving something even though it is useful or a sense of regret when wasting something (Ueda, 2010), which, in this context, is rice straw. Therefore, workshops have been conducted to educate the community that rice straw is not thrown away but can be utilized in various ways. Workshop activities include making *warakame* straw crafts or turtles, an auspicious animal from rice straw, which symbolizes longevity (Takimoto & Oura, 2016). In this workshop, *shimenawa* or ropes made of woven rice straw or jute fibres used in purification rituals are also made, and *kakashi* or scarecrow are made to repel birds with a thematic design to attract tourists to Oyama Senmaida. This activity initially started from the interest of local people who are now teachers in the straw workshop in straw crafts, from which they have learned how to make them to be taught as one of the workshops programs.

Study through nature

This program was designed in relation to ecosystem education in the Oyama Senmaida area and its conservation efforts through collaboration between external parties and local guides. The activities of this program include observation of natural elements of rice terraces such as firefly, survey of egg laying of giant salamander, and others that aim to provide education on the importance of preserving the natural environment. This activity is mainly targeted at school students with a total of approximately 3,000 students as participants each year. In the observation activity, a program called “bandit experience” was created by inviting children to create their own playground in the forest while caring for the degraded forest, playing Tarzan with the vines, catching insects in the autumn fields, and observing the forest at night. The program is called "bandit” to provide a fun image and express the idea of doing things freely and happily in the mountains. Creating biotopes is also one of the programs with school students focused on the conservation of aquatic life using abandoned rice fields. Biotope is a term originally used in environmental protection and wildlife conservation and has been applied to landscape architecture in Europe, America, and Japan over the past decade (Huang et al., 2017).

Indigo dyeing and rice farming experience

Aside from agricultural activities and indigo natural dyeing class in the ownership and trust program, Oyama Senmaida also makes one-day programs related to experience rice farming activities such as lectures on agriculture to practical activities such as harvesting rice. Indigo dyeing may also be selected by the group and implemented with a dynamic time without following the cotton and dyeing trust schedule. The main target of this activity is for educational institutions from kindergarten to high school.

Light up festival

This program is a tourist attraction to encourage tourists to come to the Oyama Senmaida area using LED lights spread throughout the rice terrace area. Illuminations itself are a popular "spotlight" attraction in Japan that dates back to the successful lighting of the first arc lamp in Japan in 1879 and the first streetlamp in Ginza, Tokyo, in 1882, since which electric lights have changed the outdoor landscape and attracted many people (Oda, 2011).Originally, the light up activity in Oyama Senmaida was inspired by the same activity in Fukuoka, initially using 3,000 torches with bamboo with real fire instead of LED and produced in collaboration with high school students from Tokyo. After 10 years, the torch lighting was replaced with LED technology with energy sources from solar panels due to the simplicity of preparing for the event. The LED lights in the Oyama Senmaida area will automatically turn off and on from 5:00 PM to 8:00 PM.

Satomai dance performance

Satomai is Japanese dance born in Satoyama, the theme of which is “a gift from rice terrace” and choreographed by Junko Nagamura to preserve the Oyama Senmaida area. This dance represents listening to the ancestors who shaped the rice terraces, wild plants, and the signs of the animals that live nearby.

Therefore, the dance represents not only humans, but also animals, rice, wind, and time. Almost all of the dancers are local children born in the Kamogawa river area and women who raised their children there. Junko Nagamura herself, as a dancer and choreographer, was an external element of the revitalization activities at Oyama Senmaida who eventually moved to live in Kamogawa in 2000 and focused on studying rice cultivation at Oyama Senmaida (Figure 7).

Figure 7. Light up festival (left), and Satomai dance performance (right)

Photo contest

The Oyama Senmaida revitalization program was originally a recommendation from a photographer because of the potential of the area. With the potential for attractive landscape views, the rice terrace area, especially Oyama Senmaida, may attract photographers to come and take photographs. Therefore, the rice terrace photo contest is held regularly in Oyama Senmaida and participated every year. In this competition, the prize is also a local product, namely Oyama Senmaida Tensui Rice.

From all the activities designed by the Oyama Senmaida Preservation Society, the foundation of development is based on the traditional approach. Therefore, the program becomes unique and aesthetic and has values that are important in experiencing activities such as social, environmental, and cultural aspects. Agricultural activities that almost entirely use traditional methods are not only an attraction for the community, but also a solution for farmers in rice terrace areas that experience difficulties in accessing large dimensions of agricultural machinery. In general, the focus of the revitalization of Oyama Senmaida is divided into two categories, namely (1) preservation programs such as traditional rice farming, food culture experience, old house renovation workshop, rice straw craft workshops and (2) new development program such as cotton and indigo dyeing trust, light up festival, Satomai dance, study through nature, and photo contest.

Both focuses of the revitalization program considered local and external potential. In terms of local potential, there are several supporting elements, the first of which is human resources such as farmers, experienced carpenters, and the willingness of local people to learn new things and their openness to external communities. The second of these elements is the existing conditions in the Oyama Senmaida area such as rice terrace areas, forests, ecosystems, and traditional houses. The third element is local culture, such as agriculture, wood processing, culinary, and others. In terms of external potential, the supporting elements include external cultural potential such as cotton planting, human resources, where external elements contribute development ideas such as the Satomai dance, and conservation methods such as biotopes supported by external organizations.

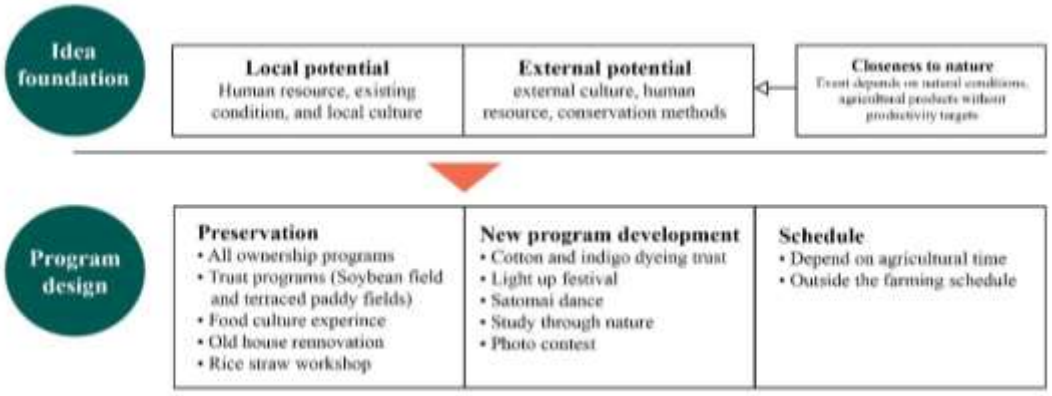

Figure 8. Oyama Senmaida program design development pattern

In the design process, various approaches are carried out between members and organization staff, including regular evaluation and development meetings. This activity tends to be used a drinking party approach, where members speak each other about various things and express their opinions. Development discussions are also conducted using online media, namely using LINE groups provided for all Oyama Senmaida members. National scale development is ensured through the annual Tanada Summit, which is held every year with the aim of improving the local economy of the rice terrace area.

Regarding the schedule of activities, the implementation time is divided into two, namely those that depend on agricultural time and off-farm schedules. Activities that depend on agricultural time, such as the rice terrace ownership system, start in March with maintaining the ridges to prevent water leakage in the rice fields and end with ploughing for the next year's planting in October. Workshop activities and experience, namely making rice straw crafts, are dependent on rice harvest time (August), where there is a workshop to make *kakashi*, followed by December by making *shimenawa* and *warakame* to prepare New Year decorations. The indigo dyeing and rice farming experience are also one-day programs whose timing depends on the farming schedule, though they have a more dynamic schedule, depending on the agreement with the group participants.

Table 1. Oyama Senmaida program schedule

PROGRAMS	MONTHS											
	1	2	3	4	5	6	7	8	9	10	11	12
Ownership Programs												
Terraced Paddy Field Ownership System			●	●	●	●	●	●	●	●		
Sake Production Ownership System	●	●		●		●		●		●		
Trust Programs												
Terraced Paddy Field Trust					●	●		●	●			
Soybean Field Trust	●						●	●				●
Cotton and Indigo Dyeing Trust		●			●		●		●	●	●	●
Workshop and Experience												
Study of Renovation of Old House	●	●	●						●	●	●	●
Food Education (*shokuiku*)											●	●
Rice Straw Craft (*warazaiku*)								●				●
Bandit Experience							●				●	
Indigo Dyeing and Farming Experience							●	●	●	●		
Other Programs												
Light up Festival	●									●	●	●
Satomai Dance										●		●
Photo Contest	●						●					

In the sake ownership program, rice planting activities begin in April, followed by grass mowing and harvesting in August, which usually comes earlier than the rice terrace ownership system harvest schedule. This stage is followed by the sake brewery process with label and drinking cup making in October and sake brewery in January of the next year and brewery opening in February. In the rice terrace trust, the planting schedule is in early May during the golden week, grass mowing in June and August, and harvesting in early September, which is almost the same as the rice terrace ownership program but with fewer activities. The cotton and indigo dyeing trust is carried out in accordance with the time of cotton and indigo planting, which is mid-May, followed by weeding, pruning, and harvesting indigo raw leaf in late September and cotton harvesting in early November. In the same month, there are post-harvest activities such as cotton spinning and weaving experience in December. The next year, in early February, there is an exhibition of works and a workshop on the use of dried indigo leaf dyeing.

For activities that do not depend on agricultural schedules such as in the workshop and experience category, the study of renovation of old house is an activity with the longest schedule carried out from September to March with 10 meetings, where the subject can change depending on the progress of the old house renovation work. Bandit experience (nature observation) has a schedule according to certain seasons such as summer and autumn during which time there are natural signs that can be observed. Other

programs such as the light up festival have a long implementation time from October to January because they are aligned with the end of the year, which is identical to illuminations in the city. On the other hand, photo contest is a full-year activity because photographers may take photos of rice terraces from various seasons.

Through its activities, particularly those related to agriculture, the Oyama Senmaida preservation Society emphasizes the concept of closeness to nature, prioritizing the balance of the ecosystem by not using chemicals in cultivation. Under certain conditions, such as the abundance of birds or other animals, and typhoons are part of natural phenomena. Therefore, the agricultural activities do not emphasize high productivity aspects such as planting that aims for commodity products, so it does not guarantee that the yield will be maximized. For example, in the rice terrace ownership system program, in 2022, each member received 35 kg of rice while, in 2023, despite working optimally, the rice distributed was 32 kg, meaning fluctuating yields.

The main approach of this revitalization program is the ownership system that promotes urban-rural exchange. The most important component of this approach is that, due to limited human resources in rural areas, it requires the participation of urban communities through schemes offered by Oyama Senmaida. On advantage of this approach is togetherness. For example, in rice terrace ownership activities, agricultural activities become interesting because participants communicate, work, and learn together following the concept of exchange. Therefore, in this context, teachers are not only from the local community, but also from external communities. In this urban-rural context, the target market is an element that supports the sustainability of the program. Therefore, most participants are from the nearby areas of Chiba Prefecture and Tokyo. However, this system does not rule out the possibility of participants from outside the region and even internationally for activities. In 2023, a group of high school students from Taiwan came to do a short workshop.

Another supporting element of sustainability is cooperation, for which there are two approaches, using either internal and external elements. Internally, there are three cooperation approaches that are part of Kamogawa City area, namely with local communities in the Oyama Senmaida area such as farmer groups, mothers, craftsmen, carpenters, and others. The second form of cooperation is with the government, such as Kamogawa City Tourism Association, which provides marketing support through websites and other media and facilitates access for people visiting the Oyama Senmaida area. Local companies are also partners in supporting various programs at Oyama Senmaida, such as local sake companies, as well as ceramics to provide culinary activities or sake production ownership programs.

In terms of external elements, the cooperation built includes educational institutions such as elementary schools, high schools in Tokyo, and universities that become members in workshop activities or help prepare specific events. Private companies such as Aeon, through the Aeon Environmental Foundation, also become partners and provide support, particularly in the conservation program of living things in Oyama Senmaida and the surrounding area, such as by creating biotopes with the aim of conserving waterside organisms and developing forests. Oyama Senmaida is also part of the National Rice Terrace Liaison Council, which hosted the national Rice Terrace Summit in 2002. The purpose of the council is to revitalize the region through members' active participation in an organization where municipalities, various organizations, and individuals who own rice terraces from networks through these rice terraces.

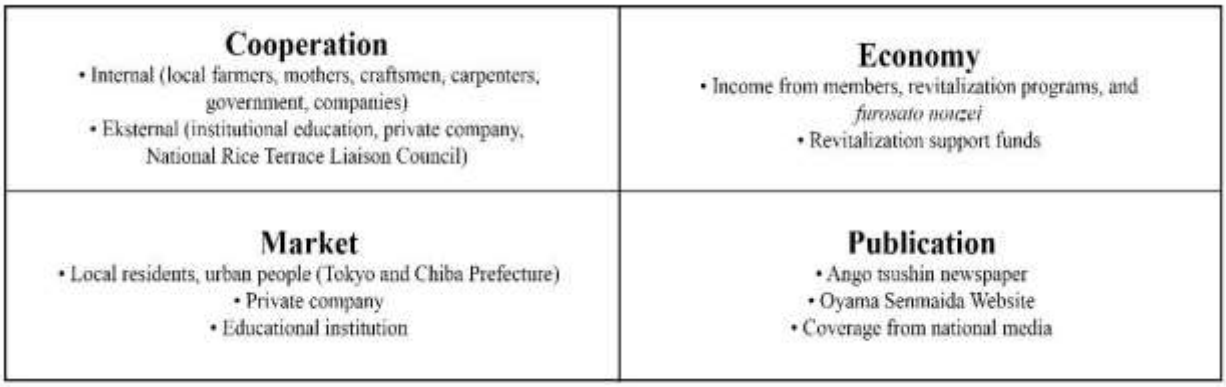

Figure 9. Elements supporting the sustainability of the Oyama Senmaida revitalization program

The economic aspects also become elements of program sustainability, and Oyama Senmaida obtained funds from activity income and revitalization support funds. In terms of income, Oyama Senmaida

earns income from several activity schemes, including annual membership or regular membership donations, ownership programs, trusts, and various workshops and experience programs. Another source of revenue is through the *furosato nozei* program, a government program where individuals are able to allocate a portion of their income tax payments to their favourite city. In addition to tax credits, under this program, donors also benefit from receiving "reciprocal" or "thank you" gifts from the donating municipality of local specialty products and food (Fukasawa et al., 2020). With this program, Oyama Senmaida offers farmed rice and various ownership and trust programs to taxpayers.

Oyama Senmaida obtained revitalization support funds from various schemes, the majority of which were from the government, such as support funds in building office facilities that became workshop areas. Another program is the Direct Payment Program for Mountainous Areas facilitated by the Rural Development Bureau. The program provides financial support for two activities, namely activities to continue agricultural production with scopes of agricultural production activities such as (a) activities to prevent agricultural abandonment and waterway management activities and (b) activities that promote multifunctionality, such as: landscape crop planting and farming experience. Secondly, within the scope of positive activities for system improvement, in the context of Oyama Senmaida, an example of activities supported is improving agricultural productivity, such as the improvement of production conditions, communalization of machinery and farm work, initiatives with the participation of women and young people.

Publication is an important element in this program in socializing Oyama Senmaida's activities to internal and external elements, and various publication approaches were carried out, such as making the Oyama Senmaida Preservation Association official newspaper from 1999 under the name *Ango Tsushin* to publicize activities four times a year. A digital website was also created and became the most effective medium as the number of accesses increased due to regular updates to the homepage, which indicated a high level of interest. Coverage from popular national media outlets such as NHK also generated widespread awareness nationwide, increasing interest in the event.

Other programs are more focused on attracting large numbers of tourists to visit landscapes. Specifically, the light up festival has successfully attracted more than 10,000 visitors, and the photo contest has had 3,000 participants. While workshop and experience activities are a category of short-term programs, such as food culture, making straw crafts, and study through nature. The workshop and experience program has a dynamic schedule of activities with consideration of registrants and seasonal suitability, which may attract participants in many events. Between July and October 2023, approximately 35 workshop and experience events with rice straw crafts, nature observation, indigo dyeing, and farming activities were attended by approximately 30 educational institutions, companies, or government institutions.

Preservation programs such as the ownership, trust program and the study of renovation of old houses are activities that have far fewer participants because the nature of the program is long term, requiring commitment. On the other hand, these programs have the potential to have a sustainable impact in internalizing the learning process even if not all members consistently follow the entire flow of activities that have been designed (Figure 10).

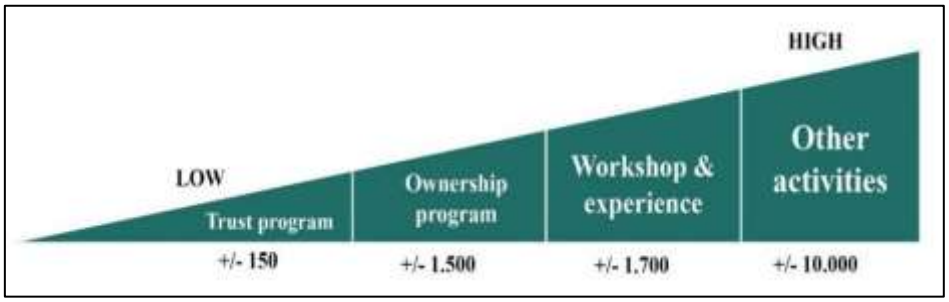

Figure 10. Number of participants July-October 2023

From the activities that have been carried out, various obstacles to the urban-rural approach are faced as in the revitalization process, among others. The first obstacle is related to urban communities who are not local people and cannot work in the fields all the time. As such, local people are needed to cover their work. Secondly, the number of local workers is decreasing. As of 2023, approximately 10 people were working, meaning that it is a burden for the organization in the future. Thirdly, the younger generation has little or no interest in agricultural activities. Firstly, newcomers to the village are still not ready to replace professional workers.

Based on these conditions, it is important to convey this message to younger generations, particularly in the Chiba Prefecture and Tokyo area. Therefore, the organization prepares various hands-on activities, mainly at educational institutions, where various workshops focus on these segments such as in the arrival of approximately 5,000 students from 70 schools in 2022. University-level activities were also organized, such as Tanada Environment University, which was designed for students to think about the development of rice terrace areas, which approximately 100 students from 10 universities attended.

The trend of remote work also supports the presence of immigrants in Oyama Senmaida in the future. Based on sampling results in 2023, 51.2% of companies allow their employees to work remotely (Matsuoka, 2024). This opens up opportunities for immigrants to continue working remotely and earn a steady income from the village area. The younger generation's awareness of the concept of "slow living" is also increasing their interest in living in the village to experience the charm of the location and starting a new life there, which in some cases leads to saving marginalized villages from the brink of extinction (Iizuka, 2017).

Based on the above background, Oyama Senmaida has influenced some urbanites to immigrate to the area, where almost every year, there are families who move in after participating in the ownership program, not only in the Kamogawa City area, but also in Tateyama and Minamiboso. People who move in usually have two houses; in addition to one near the Oyama Senmaida area, they tend to have one in the city. The role of newcomers is important for the sustainability of revitalization, particularly in relation to the regeneration of internal staff in the village, where the active age is decreasing. To address this issue, in addition to newcomers, the retirement age has also been increased from 60 to 65 due to limited local workers.

4. CONCLUSION AND RECOMMENDATION

Oyama Senmaida is a rice terrace area revitalization programs in Japan that has successfully implemented the urban-rural exchange approach in the process. There are several supporting elements in this program, such as the design of activities with a good educational narrative supported by attractive natural scenery, cooperation that is built both internally and externally, income strategies and external funding support for the development and preservation of activities, continuous publication through newspapers, websites, and national media, and the participation of urban communities in Chiba Prefecture and Tokyo as its main market to ensure that the program is sustainably performed. The main problem that will be faced in the future regarding the sustainability of the program is the limited number of local staff who are to become mentors and manage the activities. Therefore, in terms of future program design, it is important for Oyama Senmaida to focus on a regeneration program by creating a campaign related to the importance of revitalizing the rice terrace area and promoting the various positives elements that can be achieved when living in this village in terms of economy, health, and basic human values, which are increasingly disappearing. In supporting the sustainability of the revitalization program through an urban-rural exchange approach, the government's role is very central, such as in providing funding for the implementation of activities, as well as supporting facilities for immigrants in terms of housing, transportation, employment, and children's education in the village.

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