Globally Important Agricultural Heritage Systems (GIAHS) Application

I. SUMMARY INFORMATION

Name of system: Nishi-Awa Steep Slope Land Agriculture System

Requesting agency/organization:
Tokushima Prefecture Nishi-Awa Area (two cities and two towns: Mima City, Miyoshi City, Tsurugi Town and Higashi-Miyoshi Town)
Name of organization: Tokushima-Mt. Tsurugi GIAHS Promotion Association
Composition of organization: Mima City, Miyoshi City, Tsurugi Town, Higashi-Miyoshi Town, Mima Agricultural Cooperative Association, Awa-Miyoshi Agricultural Cooperative Association

Responsible ministry: Ministry of Agriculture, Forestry and Fisheries

Location of the site:

Fig. 1: Location of Nishi-Awa on Shikoku Island, Japan

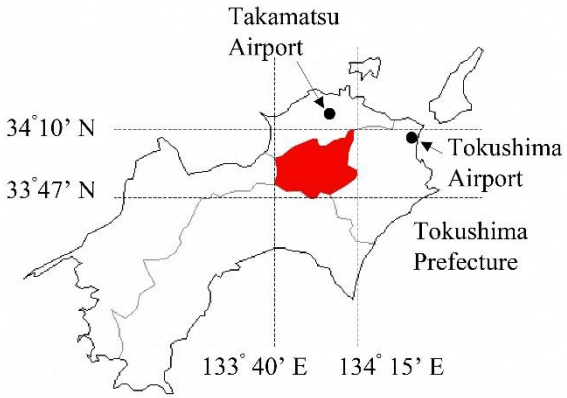

Fig. 2: Site of Nishi-Awa Steep Slope Land Agriculture System on Shikoku Island

The site lies within longitude 133° 40' E ~ 134° 15' E and latitude 33° 47' N ~ 34°10' N.

Accessibility from Tokyo:
(1) Via Haneda Airport: 70 minutes to Tokushima Airport; approx. 1 hour by car from the airport to the applicant area.
(2) Via Narita International Airport: 85 minutes to Takamatsu Airport; approx. 1 hour by car from the airport to the applicant area.

Area: 1,405.88 km^2 (farmland: 9.89 km^2, forest: 1,191.30 km^2)

Agro-ecological zones: Temperate zone mountainous region cropping area

Topographic features: Steep slope land along the northern ridge of the Shikoku Mountains

Climate type: Temperate humid climate ~ alpine climate
Average annual temperature in plain areas is 15.2°C, annual precipitation is 1,400 mm. It has high temperatures and humidity in summer and low temperatures and dry in winter. There is low precipitation in the plain areas but with increasing altitude the temperatures get lower precipitation gets greater. The annual mean temperature at an altitude of 560 m is 12°C and annual precipitation exceeds 2,200 mm with some snowfall in winter.

Approximate population (beneficiary): 80,962 (10,000)

Ethnicity/indigenous population: Not applicable

Main sources of livelihood: Agriculture and forestry; green tourism

Executive summary of the Nishi-Awa Steep Slope Land Agriculture System:

Known as “Nishi-Awa,” this area comprises two cities and two towns located in the western region of Tokushima Prefecture, in the central area of the Shikoku region, and in an area rich in nature nurtured by the second-highest peak in Western Japan, Mt. Tsurugi (1,955 m) and the Yoshino River (also known as *Shikoku Saburo*). In addition to the harsh snowy winter climate unique to mountainous regions, the area is subjected to multiple typhoons passing through during summer and autumn, and therefore faces a natural environment that could even be called cruel. In order for residents to live in this harsh environment, the “Nishi-Awa Steep Slope Land Agriculture System” (hereinafter referred to as the “System”) was developed over a long period of time.

Agriculture in this area is characterized by a land management system that utilizes mountain slopes with versatility. Top soil is shallow, and in places the steepness of slopes is as much as 40 degrees. On steep mountainsides deemed unsuitable for cultivation, a unique method of land use is employed, allocating land for cropping, grassland, and residential land in accordance with the conditions of the steep slope land, and sustainable agriculture is carried out leaving the mountain slopes intact, without creating rice terraces or terraced fields through (1) adjustment of drainability through the cultivation of farm fields with ridges, furrows and stone hedges along contour lines; (2) covering the ground with *kaya* (plants used for thatching, mainly Chinese silvergrass (*Miscanthus sinensis*)) gathered from grasslands in order to prevent soil erosion; and (3) use of deep tillage using conventional agricultural tools and cultivation techniques for restoring lost soil in order to supply new surface soil.

Furthermore, these sloping fields have been continuously used to cultivate many grain and vegetable varieties that are unique to the region, and even today this system is preserving diverse and valuable genetic resources.

In addition to continuing to grow these native genetic resources, the residents cultivate small quantities of a large variety of foods, including buckwheat, Asian royal fern, tea, fruit trees, and vegetables. This produce is shipped to Japan Agricultural Cooperatives (JA) and 30 or so farmers’ markets, providing a source of income. Furthermore, the grasslands that are essential for maintaining the sloping fields are home to various rare plants and animals, contributing to the preservation of biodiversity.

The mountain village landscape created by the interweaving steep sloping fields, grasslands, and *kominka* (traditional Japanese-style houses) spread across the mountainside form “another world, like Shangri-La" according to Asian cultural researcher Alex Arthur Kerr. Within this landscape various agricultural and food cultures are continued to this day, including—*sobagome zosui* (buckwheat porridge) and *kohikibushi* (songs sung by people as they mill grains cultivated in their harsh environment)—which are linked to historical backgrounds such as the *Heike no Ochudo* legend. These have attracted people from around the world, and the number of inbound tourists visiting the area is rapidly increasing. This collaboration between tourism and agriculture is providing a new double-track plan for agriculture in the area.

This System is full of wisdom for enabling people to continue to live abundant lives through agriculture by adapting flexibly to the natural environment, weather disasters, and social changes under the harsh conditions of steep slope land.

Moreover, the area’s agricultural methods that have been passed down over generations and genetic resources for grains that can be cultivated even in infertile soil have the potential to be of use in resolving the world’s food problems.

In these terms, the System is thought to have the potential to provide hints for resolving various issues facing humankind with respect to the vulnerability of global agriculture as the simplification of staple crops progresses and resilience through diversified staple food cultivation, thereby greatly contributing to the world.

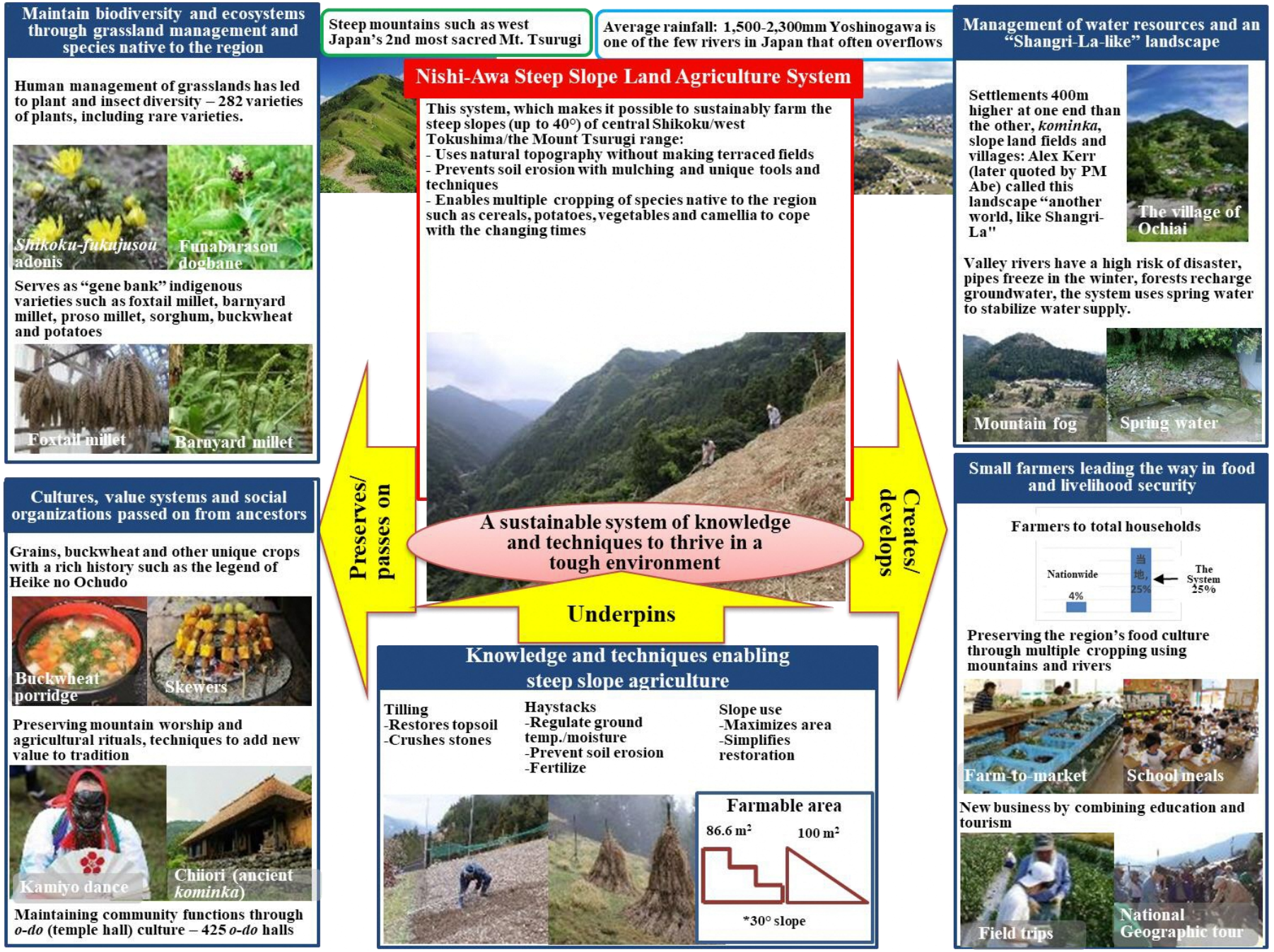

Figure 3. Overview of Nishi-Awa Steep Slope Land Agriculture System

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II. DESCRIPTION OF THE AGRICULTURAL HERITAGE SYSTEM

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1. Significance of the proposed GIAHS site

(a) Natural environment and social characteristics of the Nishi-Awa area

[Geographical conditions]

Located in the central part of the Shikoku region, the Nishi-Awa area comprises two cities and two towns (Mima City, Miyoshi City, Tsurugi Town, and Higashi-Miyoshi Town) in the western part of Tokushima Prefecture, which is bordered on three sides by Kagawa, Ehime, and Kochi prefectures. Some 84.7% of the area is covered in forest (Japan average: 66%). [Tokushima Prefecture Forest Resources Present Status Survey 2016]

The area has been known since ancient times as a pilgrimage site for *Shugendo* (Japanese mountain asceticism incorporating Shinto and Buddhist concepts), and with an elevation of 1,955 m, the subject of this mountain worship, the sacred Mt. Tsurugi, is the second-highest mountain in Western Japan. The area's beautiful, magnificent nature also features other mountains soaring more than 1,800 m high, including Mt. Jirogyu and Mt. Miune.

This mountainous region with Mt. Tsurugi at its center experiences snowfall in winter, with roads freezing over. While during the summer months it is impacted time after time by typhoons, with the annual precipitation for the Kyojo district of Miyoshi City exceeding the Tokushima Prefecture average at 2,209 mm/year [Japan Meteorological Agency 1981–2010].

Into these mountains are carved numerous deep, steep-walled valleys leading down into the Yoshino River. There is very little open land along these valleys, and because of these harsh conditions, the unique Nishi-Awa Steep Slope Land Agriculture System (hereinafter referred to as the "System")has been developed and employed since ancient times, utilizing mountainside land sloping of up to 40 degrees as fields without creating terraces, etc.

Agricultural land including abundant forests and houses are integrated, perching on slopes interwoven with rugged mountains and deep valleys as if stuck there with glue, creating uniquely beautiful scenery (Photo 1).

Photo 1. Representative steep-slope settlements: Keka Village (left) and Kurishito Village (right)

[Origins of the steep slope land]

The Japanese archipelago is located near the edges of multiple tectonic plates, and the Median Tectonic Line is one of the world's largest faults, which are formed by the movement of these plates. The Nishi-Awa area is located on this tectonic line, and landslides and landslips caused by heavy rain in addition to repeated land uplift and transformation have formed a region of steep mountains (Photo 4) [Geotectonic Subdivision of the Japanese Islands Revisited; 2010].

Due to the steep topography and abundant precipitation, the Yoshino River flowing through the center of the area has flooded repeatedly, recording the highest peak flow for basic flood discharge (which indicates flood flow volumes) in Japan [Ministry of Land, Infrastructure, Transport and Tourism, Yoshino River System River Improvement Plan 2009], and is referred to as "Shikoku Saburo" due to its reputation as the Japanese river system that overflows its banks the most. Despite this, the river's water quality is good, and in particular, the Anabuki and Sadamitsu rivers, which flow through the Nishi-Awa area, boast the clearest water in Japan [Ministry of Land, Infrastructure, Transport and Tourism, Recent Condition of Water Quality of Class A Rivers in Japan 2015].

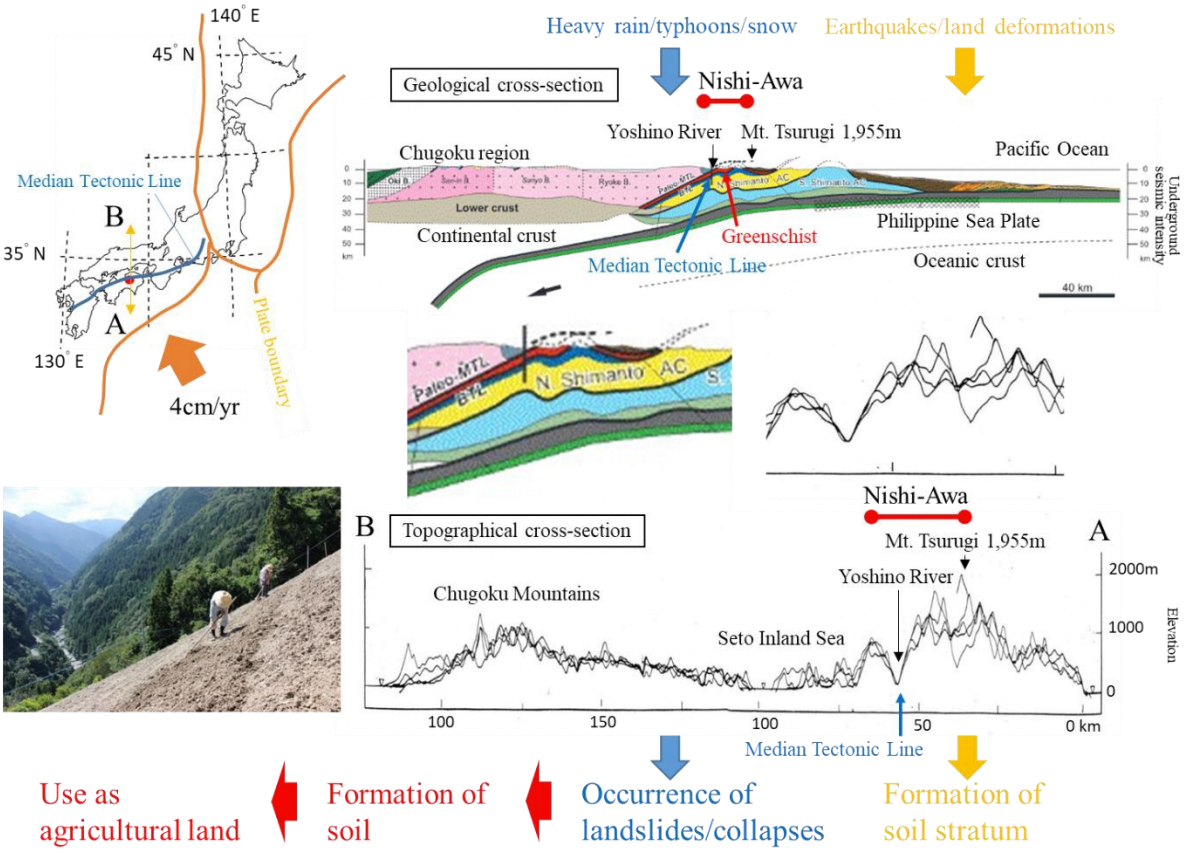


Figure 4. History of steep slope land and utilization as agricultural land

The sloping land in the Nishi-Awa area is classified into two types based on the direction of the geologic strata: *hinoji* ("anaclinal slope" in which the incline of the slope and the incline of the stratum are in opposite

directions) and *kageji* (“cataclinal dip slope” in which the incline of the slope and the incline of the stratum are in the same direction) (Figure 5 and 6). *Hinoji* have a very steep incline, but are appropriate for agriculture in terms of the fact that the slopes face southward. In contrast, *kageji* have gentler inclines but get hardly any sunshine due to their facing northward. It is believed that the settlements in this area were established through people settling on land created by *hinoji* slope landslips and *kageji* landslides in order to avoid the deep, narrow, valleys subject to frequent flooding. Even today, there are more than 200 village spread out over a wide area on mountainsides with elevations of approx. 100–900 m (Figure 7).

Geological structures of “cataclinal dip slopes” and “anaclinal slopes”

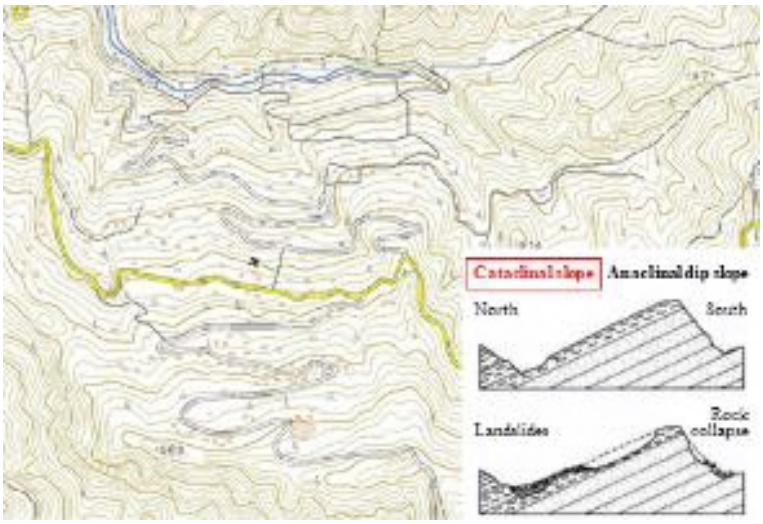


Figure 5. Example of *kageji* (“cataclinal dip slope”):
Keka District, Tsurugi Town

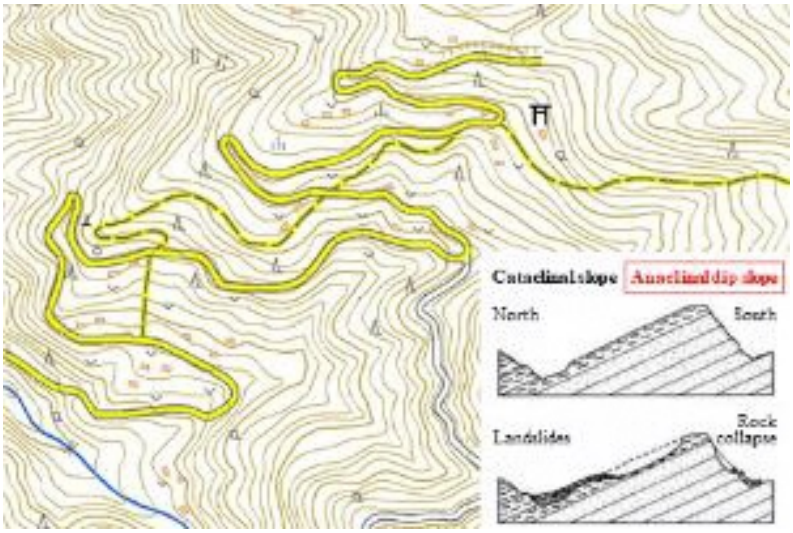


Figure 6. Example of *hinoji* (“anaclinal slope”):
Kiriu District, Tsurugi Town

Due to fault eruptions running along the Median Tectonic Line, this sloping land provides plentiful spring water and has the additional advantage of avoiding flooding by the Yoshino River, which is one of Japan's rivers that overflows most often. On the other side, the land is also frequently subjected to landslides, soil erosion, and other damage from excessive water, and so the Nishi-Awa Steep Slope Land Agriculture System is the fruit of knowledge and innovations for people to deal with the harsh environment, utilizing its advantages while overcoming its disadvantages.

Figure 7. Nishi-Awa steep slope land villages and geological structure

[Agriculture on steep slope land]

Since it is difficult to plant rice here, the Nishi-Awa area is one of Japan's leading areas for controlled-burn agriculture, and the cultivation of grains as staple foods has been widespread in the Nishi-Awa area since ancient times.

Even now, cultivation of a diversity of varieties is continuing, with a large number of indigenous varieties such as foxtail millet (Photo 2), proso millet, Japanese barnyard millet, sorghum (Photo 3), finger millet (Photo 4), great millet, and buckwheat existing, and so the area also has the function of a so-called "gene bank."

Furthermore, traditional agricultural methods such as covering sloping fields with *kaya* and constructing ridges and stone walls along contour lines prevent soil erosion and enable sustainable agricultural production and preservation of the natural environment.

Moreover, the grasslands that are essential for securing the *kaya* needed to maintain the sloping fields are home to a diversity of animals and plants, thereby playing a significant role in preserving the ecosystem.

Photo 2. Foxtail millet

Photo 3. Takabiki (sorghum)

Photo 4. Finger millet

(b) History of System formation

Photo 5. A *sora* settlement
(Handa, Tsurugi Town)

The history of the Nishi-Awa Steep Slope Land Agriculture System is said to date back to shifting cultivation (slash-and-burn agriculture) in the latter part of the Japanese Jomon period (before 300 BC), pre-dating the introduction of rice growing to Japan. Mt. Tsurugi's sloping land settlements (Photo 5) are called *sora*, indicating the heavens, and legend has it that "the closer people live to the mountain peak, the more noble they are, and people from near the peak came down into the valleys," and that "villages were established from the upper parts of the mountain down towards the valley floor along the river."

With regard to the concept of *sora*, it is said that "the people living on the flatlands in early modern and modern times referred to regions of the Shikoku Mountains where excellent shifting cultivation has been carried out up to the present day as "*sora*" when emphasizing the viewpoint of the 'rice-cultivation society' to indicate an essentially different 'mountaintop shifting cultivation society'" [Illustrated Guide to the History of Tokushima Prefecture 1994].

"Awa," the ancient name for Tokushima Prefecture, is said to be derived from the Japanese word for foxtail millet (*awa*), which was cultivated on shifting cultivation farmland, and so it can be said that the grain production carried out on the sloping land of "Nishi-Awa" is an even more ancient Japanese agriculture system than rice-growing.

Furthermore, following their defeat in the Battle of Yashima in the 12th century, it is said that the Taira clan (Heike) crossed the Yoshino River from the Sanuki Mountains, escaping to the Iya region in the mountains of this secluded area. This legend of *Heike no Ochudo* (fleeing Heike warriors) continues to be recounted to this day, and numerous legends and relics—such as *kazura* (vine) bridges in the Iya Valley and the red military flag of the Heike—remain. The Nishi-Awa area enthralls tourists from within Japan

and abroad as one of Japan's few remaining secluded regions.

In fact, until modern times the Nishi-Awa area was Japan's representative shifting cultivation zone. According to records from 1908, the cultivated acreage for grains (four varieties) in Tokushima Prefecture was 4,072 ha, of which 70% was located in the Nishi-Awa area. [Tokushima Prefecture Statistical Document]. Records show that in 1950, approx. 2,000 ha of shifting cultivation land was distributed in the Shikoku region—an area comprising some 19% of the national total [Iya 1994]. When tobacco was first introduced to Japan approx. 400 years ago, during the Japanese Keicho era (1596 – 1615), the slope land villages in the Nishi-Awa area were quick to respond, carrying out intensive cultivation of a leaf tobacco called *awaha* as the second crop of millet cultivation (Photo 6). The dramatically successful cash crop of tobacco brought prosperity to the area, providing the motivation for the construction of the now-famous *udatsu* (ornate firewalls between buildings) townscapes (Photo 7).

Photo 6. Cultivation of leaf tobacco on sloping fields

Photo 7. Townscape showing merchant houses and *udatsu*

From the 1970s onwards, tobacco production in the Nishi-Awa area declined, as did the number of farmers due to population decreases and the aging of the population; however, due to its excellent social resilience, the steep slope agriculture system was able to flexibly transform once more, continuing to produce precious indigenous varieties. Today, armed with this history and background, the area is expanding its agricultural activities into the fields of hands-on agriculture experience/workshops and cross-industry collaboration (what Japan calls sixth-sector industrialization, the integration of primary, secondary and tertiary industry processes).

(c) The System's originality and special points

[A system that has made steep slope farmland sustainable]

In the Nishi-Awa area, there are numerous village settlements spread over the slopes of steep mountains such as Mt. Tsurugi, with the total number of settlements, large and small, exceeding 200.

Generally speaking, steep sloping land with an incline of more than 15 degrees is classified as "marginal land" alongside cold-weather regions, arid regions, high-altitude regions, and acidic soil areas. In contrast, the people living in the Nishi-Awa area utilize the natural topography of steep sloping land on mountainsides as is, without building terraces (rice terraces, terraced fields), even on slopes with inclines

exceeding 25 degrees, to create regular fields (sloping fields) and covering the ground with kaya as well as using unique agricultural tools and techniques to control soil erosion. Furthermore, diversified agriculture centered on indigenous buckwheat, grain, potato, and vegetable varieties and that flexibly responds to changes in the times has established a sustainable system that continues to operate to this day.

Here we will compare the Nishi-Awa area to other areas similarly carrying out steep slope land agriculture—the central mountain region of Nepal and the northern mountain region of Thailand (Table 1).

The landscape in the central mountain region of Nepal is very similar to that of the mountain region of Nishi-Awa, but the region is located at a high altitude of approx. 1,000–2,000 m (Photo 8). Here level terraced fields have been created, and crops such as corn, barnyard millet, foxtail millet, and soybeans are cultivated. Annual precipitation in that region of Nepal is also heavy, approx. the same as that in Nishi-Awa—around 2,000 mm/year. Farmers plant trees and vegetation on the managed slopes and steep walls of the terraced fields, covering the surface soil in order to prevent soil erosion (Photo 9). In many cases houses are located near ridges. In recent years, farmers have begun to plant trees and vegetation appropriate for the climate and soil in order to prevent soil erosion even from dilapidated farmland due to deforestation [Pande, Tara Nath; Yamamoto, Hiroshi (2005), etc.].

In the northern mountainous region of Thailand (Photo 10), the government takes a central role in the use of conservation-orientated agricultural methods for general agricultural land (regular fields) is spreading; however, due to the especially steep slopes of land used for shifting cultivation, soil erosion is occurring. In shifting cultivation areas, where soil erosion is as much as 70%, the government is implementing various experimental measures as a means of preserving the soil and water quality, including planting trees, mulching the skins and stalks of harvested produce into the soil on sloping land, using minimum cultivated acreage, and planting perennials (Photo 11; Funakawa, Shinya (2015), etc.).

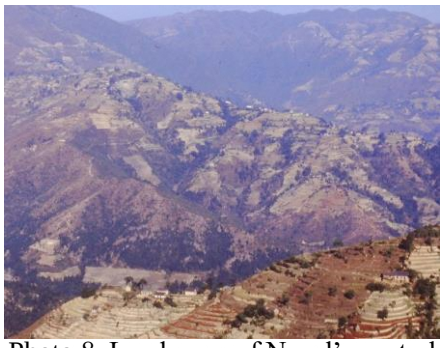


Photo 8. Landscape of Nepal's central mountain region

Photo 9. Conserving soil by planting trees

Photo 10. Landscape of Thailand's northern mountain region

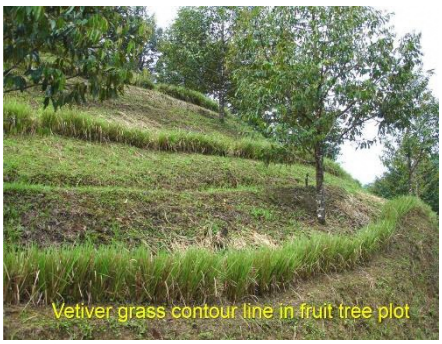


Photo 11. Ridges created in fruit forest

Compared to these situations, it can be said that the Nishi-Awa Steep Slope Agriculture System is an agricultural method appropriate for the environment. The system for preventing soil erosion by using *kaya* in fields and mulching controls grasslands separately from cultivated fields, and it can be said that there is a wealth of biodiversity. Furthermore, soil-turning and topsoil creation using special agricultural tools are prominent cultivation techniques of the Nishi-Awa area. The Nishi-Awa Steep Slope Agriculture System is a sustainable system established over some 400 years.

Table 1. Comparison of sloping land agriculture in various countries

Slope land agriculture	Nishi-Awa (Japan)	Central mountains (Nepal)	Northern mountains (Thailand)
Main topography of agricultural land	Steep slope land	Terrace (rice terraces)	Steep slope land
Composition of agricultural land	● Management of grasslands ● Agricultural land connecting grasslands and cultivation land; steep slope cultivation	● Agroforestry connecting forests and agricultural land; rainwater terraces; irrigation farmland (paddy fields)	Slash-and-burn cultivation on shifting cultivation land
Location conditions and characteristics	● Agricultural land connecting grasslands and cultivation land ● Developed settlement function	● Independent cultivation land ● Grazing land	● Independent cultivation land ● Shifting cultivation land
Cultivation techniques: main soil preservation measures	● Mix straw from grasslands into the soil to control soil erosion ● Forced lifting of soil with special farm tools and creation of new soil by crushing rocks and pebbles	Herbs are planted in terraces (paddies) to control soil erosion	● General fields: soil is by using plants ● Shifting cultivation: considerable soil erosion
(Main) crops	Potatoes, grains, vegetables, fruit trees	Rice, corn, grains, soybeans, fruit trees	Sugarcane, corn, tapioca, grains. Soybeans, fruit trees
Points to note	● Development of special agricultural tools ● A diversity of crops are cultivated, including fruit trees, besides rice	● Cultivation centers on paddy-field rice cultivation	● A diversity of crops is cultivated, including fruit trees

[A system that has existed in harmony with the forest]

The majority of this region is characterized by a fragile geology called fault fracture zones, with countless uplifts and erosions forming a steep mountainous topography. For this reason, people have avoided the steep, unstable slopes and narrow valleys and instead chosen comparatively gently sloping, stable places where landslips and landslides once occurred, and cultivated and developed communities and farmland there.

On the other hand, leaving the forest unfarmed on mountainsides and deep valleys at risk of landslip has reduced the risk of soil landslips and sediment transport. In addition, the practice of leaving the forest intact near the ridge above the village, called *hachigo-giri*, helps preserve communities and farmland and ensure water sources (Figure 8).

A: *Hachigo-giri*, leaving the forest at the summit

B: Forest on slopes at risk of landslip also remains

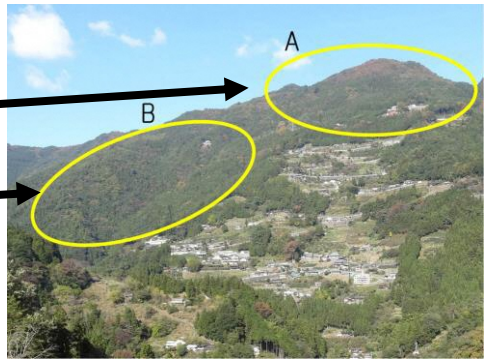


Figure 8. Forest protecting villages and farmland

As a result, forest covers 85% of the region, forming a unique landscape of 200 villages of various sizes dotting the mountainside like a mosaic, surrounded by forests.

The forest plays an indispensable role for the communities and slope farming, as it not only conserves soil and ensures water sources but also produces of timber and edible wild plants.

Only 10% of this forest is national forest, mostly concentrated over 1,000 meters where there are no villages. On the other hand, 79% (Table 2) is private forest, and most of the forest around the villages is owned by local residents. Around 60% (Table 3) of this forest is planted Japanese cedar or cypress, which are useful as building materials. [Tokushima Prefecture Forestry Survey 2016]

Table 2. Forest by ownership

National forest	Privately-owned forest	
	Public	Private
10.2%	10.6%	79.2%

Table 3. Private forest by tree species

Coniferous				Broadleaf
Cedar	Cypress	Pine	Other	
39.9%	15.0%	6.8%	0.3%	38.1%

Of the annual growth of 467,000 m³ of forest, only 179,000 m³ is logged for timber [Tokushima Prefecture Timber Supply and Demand Report 2016], so year by year, forest resources improve.

Within this, the artificially-planted cedar and cypress, which accounts for 60% of the forest, has been cut logged in about a 50-year cycle. In recent years, due to slumping timber prices and rising costs of planting after logging, more owners have stopped logging, so the ratio of eligible trees more than 50 years old has grown to 42%. For this reason, much of the forest in this region is past the need for weeding and thinning, having grown into a stable forest with little devastation.

Average forest area per owner is about 2.2 hectares, so many of the owners entrust timber production to forestry associations or companies. Currently, owners favor timber production by thinning as an occasional source of income and thus reducing over production by clear-cut logging.

In addition to firewood for fuel, the farmers in particular have long used wood and bamboo from nearby forests for pillars and fences necessary to grow vegetables, *koeguro* pillars for the haystacks of *kaya* that become fertilizer, and structures called *hade* used to dry harvested crops.

In some forests, *mitsumata*, a bush used to make Japanese paper, and *urushi*, a tree used to make lacquer, are cultivated and sold. In mountainous areas, shiitake mushrooms are cultivated and various edible wild vegetables such as bracken, royal fern and Japanese angelica tree, are collected and used in local cuisine.

In this way, the System has developed in harmony with the forest and is in fact indivisible from it.

(d) The System's contribution to resolving modern issues

i) Contribution to food security

More than 90% of the world's 575 million agricultural farms are either individual or family operated, relying mainly on a labor force comprising family members. On a monetary conversion basis, these farms produce more than 80% of the world's food [The State of Food and Agriculture, 2014]. For this reason, the contribution of family farms to food security and the securement of nutritional resources is important.

Under the Nishi-Awa Steep Slope Agriculture System, despite farms being family operated on a small scale, efforts are made to improve the efficiency of one-product cultivation while using the land intensively. Small quantities of a wide variety of agricultural products are produced without farmers seeking to expand the scale of production. This System enables a safe and highly resilient food supply, and may serve as a reference for increasing sustainability in small-scale family-operated agriculture.

Furthermore, as securing food supplies from land that is not suitable for cultivation is becoming an issue, provision of aspects of the Nishi-Awa Steep Slope Agriculture System—such as the preservation of varieties that can be cultivated under harsh environmental conditions such as in the Nishi-Awa area and sustainable land use methods—could contribute to the resolution of these issues.

In particular, the large diversity of grain varieties developed under this System could also be grown in poor soil unsuitable for cultivation and used as staple foods. The preservation of these genetic resources is globally valuable, and would be helpful in resolving the world's food problems. In particular, it is believed that these grain varieties could contribute to food security in Africa, where finger millet originates.

ii) Importance in modern times

Sloping fields have been preserved in order to ensure the food security of the farmers living in that area. At the same time, the existence of self-sufficient farmers and small-scale commercial farmers producing a wide variety of produce maintains lifestyles and communities in settlements.

However, as the population declines, the number of sloping fields is also tending to decline, and the environment in Japan's hilly and mountainous regions is facing a critical situation. Under these

circumstances, the example of the Nishi-Awa area—which is maintaining the soil environment in good condition, centered on steep slope land fields and grasslands—is extremely important in terms of preserving the biodiversity of mountain regions and Japan's mountain village.

Furthermore, from a global-scale perspective, in recent years there has been a progressive simplification of staple foods towards rice, wheat, and corn, and concerns are held for the impact of global-scale environmental changes on the global food supply. Against this background, the Nishi-Awa Steep Slope Agriculture System is an important system in terms of cultivating a diversity of staple foods—such as the native grain and potato varieties that have long been cultivated in the Nishi-Awa area—and the continuance of these varieties in order to preserve genetic resources and furthermore maintain humankind's ability to adapt to the environment.

iii) Preservation of biodiversity

In this region, rather than the farmland and grassland spreading out separate from the forest, villages and grassland dot the inside of the forest, of which 200 large and small villages are scattered at elevations ranging from 100 to 900 meters, each surrounded by different types of forest (Photos 12).

Photos 12. Villages surrounded by coniferous forest (left) and a mix of coniferous and broadleaf (right)

Villages at lower altitudes are surrounded by artificially-planted Japanese cedar and cypress as well as many evergreens such as beech and evergreen oak. As one goes higher, coniferous trees such as Japanese fir and hemlock and deciduous and broadleaf trees such as konara oak and maple begin to appear. This combination of forests with different compositions at different elevations, grasslands and farmland with various crops helps preserve diverse ecosystems.

With the spread of chemical fertilizers the number of such grasslands has decreased rapidly on a global scale, and so today the existence of grasslands and the preservation of their ecosystems are becoming important issues.

Photo 13. Grasslands management

In the Nishi-Awa area, grasslands are established around sloping fields mainly for the purpose of providing *kaya* to be used for laying over the soil or as mulch (Photo 13). These grasslands play a significant role in the preservation of biodiversity and maintenance of the ecosystem.

Preservation of the biodiversity of these grasslands has been continued precisely because it is an agricultural activity that is the foundation of field cultivation.

The forest surrounding the sloping villages, sloping fields and grasslands, and the accompanying agricultural techniques and culture, have been preserved and passed down over generations due to the awareness of farmers that these are assets that have been passed down from their ancestors. Furthermore, they have been maintained through the efforts of farms to produce 140 kinds of good-quality grains and vegetables, and diverse ecosystems and crops will continue to be preserved in the future through this sloping land agriculture system.

iv) Contribution to the prevention of global warming

Global warming impacts various fields in addition to agriculture, and efforts are currently being made by countries all over the world to reduce greenhouse gasses in order to prevent global warming.

Photo 14. Large quantity of kaya spread over a sloping field

Under the Nishi-Awa Steep Slope Agriculture System, an essential technique used to prevent soil erosion from sloping fields is spreading *kaya* that has been harvested from grasslands and dried over the soil (Photo 14). Up to 19.3 tons of kaya per hectare is spread over the sloping fields [Tokushima Prefectural Museum; 1994], and it is estimated that this amount is equivalent to 130 kg per hectare per year of nitrogen that can be used as fertilizer [Iya 1994]. The dominant plant variety found in grasslands, *kaya* (Chinese silvergrass), is said to have extremely high carbon fixing capabilities, and applying large amounts of *kaya* that has absorbed and fixed carbon while growing in the grasslands to sloping fields every year builds up the carbon levels in the soil. For this reason, the maintenance of grasslands and application of large amounts of *kaya* to sloping fields can be said to be an agricultural method that is highly effective in controlling greenhouse gas emissions.

v) Adaptability to the impacts of climate change

Due to climate changes caused by global warming, it is predicted that in future there will be a greater incidence of extreme weather events, such as larger typhoons, localized torrential downpours, and drought, and adaptive measures are required to lessen the impact of these events.

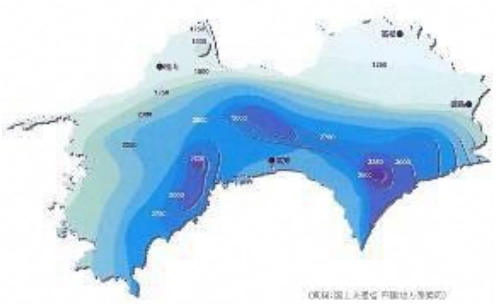


Figure 9. Annual precipitation for the Shikoku region (Ministry of Land, Infrastructure, Transport and Tourism)

In Nishi-Awa's sloping land settlements, agriculture on easily-eroded sloping fields has continued over a long period of time, despite the area being in a heavy rain zone (Figure 9). This has been possible due to the tremendous role played by traditional knowledge and

techniques, such as applying *kaya*, contour agriculture, and drainage management using stonework. It is believed that these techniques and knowledge that protect the soil from rain will also be highly adaptable to the heavy precipitation that is expected to occur with greater frequency in the future.

vi) Sustainable dynamic conservation system

It is said that there is a danger of genetic resources decreasing or becoming extinct on a global scale, and in the agricultural field, too, it is believed that promoting the conservation and sustainable utilization of useful genetic resources is important.

Photo 15. Semi-domestication for the purpose of gathering seeds

In the Nishi-Awa area, the seeds of varieties close to the original species of grains (such as proso millet, foxtail millet, Japanese barnyard millet, buckwheat, corn, soybeans and adzuki beans), potatoes (such as *goshuimo*), and vegetables (such as large cucumber and bottle gourd) have been carefully home produced and preserved (semi-domestication; Photo 15).

Production of these grain and vegetable varieties that are close to their original species is difficult to revive once stopped, and its continuation is under threat. It is therefore especially important to secure valuable seeds and maintain this agriculture. For this reason, strong varieties adapted to the climate and environment that are a match for the soil in the area and that are able to tolerate the area's climate have been cultivated and at the same time preserved in the Nishi-Awa area, leading to the establishment of a system of selection utilizing nature. Moreover, the Iya Grain Producer Association has been established with the aim of maintaining production of home-produced grains and perpetuating valuable genetic resources, and is actively carrying out promotional activities. In addition, the Tokushima Agriculture, Forestry, and Fisheries Technology Support Center also preserves grain seeds and undertakes other conservation activities, and so valuable genetic resources that have been developed through Nishi-Awa's traditional agriculture system are being preserved through both public and private efforts.

vii) Significance and potential of the System in the world and Japan

In recent years, overuse of soil has become an issue that has worsened living and production environments around the world, while in Japan and other developed countries, underuse of sloping land due to depopulation is becoming a problem.

In the Nishi-Awa area, the accumulation of knowledge and innovation for minimizing land and soil damage has enabled the perpetuation of the steep slope agriculture system as well as the securement of certain amounts of food and income.

Furthermore, valuable genetic resources for grains are being preserved through the operation of this System—which is highly adaptable to environmental issues such as climate change and biodiversity conservation—and so the System has the potential to contribute to the securement of food for humankind.

In particular, as agriculture worldwide focuses on efficiency and productivity and the simplification of staple foods progresses, the Nishi-Awa Steep Slope Agriculture System holds value that should be conveyed to future generations as a unique system and agricultural culture derived from pre-rice-farming shifting cultivation (slash-and-burn agriculture).

Moreover, molded over many years through knowledge and innovation, the Nishi-Awa landscape astounds those who see it for the first time, and this unique culture that has been continued uninterrupted down through generation to the present day is receiving praise from visitors, especially inbound tourists, as a lifestyle existing in harmony with nature and history.

Thus, further conveying the significance and attraction of the Nishi-Awa area's traditional and unique steep slope agriculture system to people around the world could also provide a case model for maintaining agricultural village environments in other areas where environmental conditions are harsh.

2. Characteristics of the proposed GIAHS site

(1) Food and livelihood security

(a) The System's contribution to the regional economy

i) Food and livelihood security in which smallholder farmers play the leading role

The Nishi-Awa Steep Slope Agriculture System is currently supported by small-scale farmers comprising mainly women and elderly people. Although the area of cultivation per farm is small, a large variety of grains and vegetables are grown. This produce is not only consumed by the farmers themselves but also shared with relatives and neighbors, or exchanged for rice or meat, providing economic effects that cannot be calculated in monetary terms.

Furthermore, indigenous varieties of grains and potatoes continue to be cultivated and used due to home production of seeds, firmly supporting the unique food culture that is a regional attraction.

In particular, buckwheat (Photo 16) and a native variety of potato called *goshuimo* (Photo 17) are the brand of this area. Moreover, vegetables such as tomato (Photo 18) and capsicum that are grown here to take advantage of the good drainage provided by the sloping land environment are vividly colored and taste delicious due to the high elevation and wide temperature variation between day and night. Produce is shipped mainly to the Kyoto, Osaka, and Kobe areas, and the daily variation of produce available at farmers' markets is also welcomed by consumers.

Photo 16. Buckwheat field

Photo 17. *Goshuimo*

Photo 18. Tomatoes

In addition, the sloping land farmers in the Nishi-Awa area have also been pioneers in welcoming students on school trips to their villages as a form of hands-on educational tour. The experience of the unique agricultural village landscape and various aspects of agricultural culture provided by the villages has been receiving praise as valuable hands-on program for children.

As the result of accepting these hands-on educational tours, some agricultural families have opened "rural bed-and-breakfasts," developing a new business that uses agricultural village landscapes and agricultural culture as resources in addition to their tradition occupation of agricultural production.

(b) Current status of economic contribution

i) Livelihood system based on small-quantity large-variety production

The Nishi-Awa area has many steep sloping fields, with 989 ha of fields where agricultural production activities are carried out having inclines of 15 degrees or more [Tokushima Prefecture 2015 (Agriculture Support)]. Currently, depopulation and aging in the area are progressing, but the percentage of farmers

remains at 25% of the area's population, which is approx. twice the average percentage of farmers for Tokushima Prefecture, and approx. five times the national average percentage of farmers of 4.7% [Agriculture and Forestry Census 2010], making agriculture an important means of making a livelihood.

Photo 19. Multiple grains, vegetables, and fruit trees under cultivation

Photo 20. Cultivation alternating Asian royal fern, tea, and fruit trees

On the sloping fields in the Nishi-Awa area, grains such as foxtail millet, Japanese barnyard millet, buckwheat and vegetables such as potatoes have been produced since ancient times for self-consumption, while cash crops such as Oriental paperbush and tobacco are cultivated in accordance with the demands of the times. In this way, the farmers of the area have supported their livelihoods while carrying out distinctive agriculture tailored to the sloping land environment (Photos 19 and 20).

With regard to important cash crops, although cultivation of the once-popular tobacco has dwindled, cultivation and harvesting of special crops such as buckwheat, tea, and konjac potato; as well as fruit trees such as *yuzu* (*Citrus junos*) and persimmon; vegetables such as eggplant, and green beans; flowering trees such as *sakaki* (*Cleyera japonica*); and edible wild plants such as giant butterbur, Japanese angelica-tree, and Asian royal fern are also now flourishing.

Photo 21. Large cucumber (left) and bottle gourd (right)

In particular, processed foods such as tea, Asian royal fern, and persimmon have long been famous as special local products of the Nishi-Awa region. Soybeans, adzuki beans, potatoes, and grains are also produced as crops for self-consumption. Currently, more than 140 crop varieties are cultivated in the Nishi-Awa area's sloping land settlements. Farmers' markets provide a large selection of produce in small quantities, and a relationship where farmers can see consumers' faces has been established, with farmers' market sales growing year-on-year.

Amongst these crops are many rare native varieties that are not in general circulation, and even today farmers in the area cultivate a small potato variety called *goshuimo* that does not fall apart when boiled; and unusual vegetables such as a native cucumber known as large cucumber and bottle gourd (Photo 21),

as well as a wide variety of grains (buckwheat native to the Iya area, great millet, proso millet, foxtail millet, Japanese barnyard millet, and corn).

Even as the agricultural workforce ages, because each farm in the Nishi-Awa area produces light crops using small-quantity large-variety production, efforts are being made to ensure that even small-scale producers in the area are able to obtain sales income. In particular, "Farmers' markets" or "produce stalls" set up at roadside stations along highways (Photo 22) provide an important sales outlet for small-scale producers, with annual sales of approx. 950 million yen achieved in 2016 [Tokushima Prefecture; 2017].

Photo 22. Farmers' market bringing together the blessing of sloping land

In addition, some 30-odd farmers' markets operated by farmers or related organizations in the Nishi-Awa area [Tokushima Prefecture; 2017] have joined together to form the "Mima-Miyoshi Farmers Market Liaison Committee" and are collaborating in conducting PR activities as well as jointly conducting workshops on food labeling and hygiene management, which have led to an improvement in production safety and reliability, as well as an increase in sales. Furthermore, food education has long been actively carried out in the Nishi-Awa area. Locally grown vegetables are supplied as ingredients for school lunches, which not only contributes to the stabilization of income for producers, but also encourages production motivation by providing these vegetables to children, who will be the leaders of the future. In addition, "Mima Mothers' Vegetables" produced by the JA Mima Women's Division Housewife Farm Operators' Group are supplied to major department store chains, achieving 15.9 million yen in sales (fiscal 2016) [Kaachan Yasai Oishiikenna Promotion Association sales performance].

In this way, the people living in sloping land settlements fully utilize their sloping fields to carry out diverse agriculture, and the agricultural products produced under this System and the processed foods (preserved foods) created from these products are extremely important not only as daily food for farmers but as an essential item sustaining the daily lives and livelihoods of the people of the area.

ii) New livestock business supporting the System

In the sloping land settlements, the number of farm management bodies decreased rapidly with the decline in tobacco and silkworm cultivation. However, currently the System is being supported by the securement of farmers' livelihoods through poultry farming and organic farming that utilizes the excreta generated by the poultry.

[Livestock/poultry farming]

Photo 23. Awaodori

Approx. 60% of the poultry farms in Tokushima Prefecture are concentrated in the sloping land settlements in the mountains of Nishi-Awa, and in highland areas with an altitude of around 1,000 m there are also summer strawberry production areas and cattle farms. In poultry farming (for meat) utilizing the mountain climate—which is cool even in summer—raising Tokushima's brand-name chicken breed, *Awaodori*, is especially popular. The *Awaodori* (Photo 23) breed has the No. 1 shipment/market share of all JAS (Japanese Agricultural Standard) registered local chicken breeds nationwide (2.092 million birds: Tokushima Prefecture 2015 (Statistics)), and the Nishi-Awa region is the country's largest producer of *Awaodori* chickens, with the area producing some 920,000 chickens—approx. half the national average [Tokushima Prefecture, 2015 (Poultry Farming)]. Developing as a replacement for leaf tobacco and silkworm farming after their decline, this livestock farming has today become an indispensable support for the sloping land agriculture system, producing brand-name poultry representative of the region as well as manure that is used as soil fertilizer.

[Recycling-based agriculture system utilizing manure]

Photo 24. Chicken manure fertilizer

In order to improve the yield and quality of cultivated crops, it is necessary to prepare the soil using fertilizers. Up until the 1970s, each farm would keep cattle for tilling the fields and use their manure as fertilizer, returning it to the soil in a recycling-based agriculture system. Using animal-derived organic fertilizers also has the effect of accelerating the decomposition of *kaya*, which has an important effect on this area, where large amounts of *kaya* are spread over the sloping fields.

Subsequently, farmers stopped keeping cattle as the use of agricultural equipment spread, cutting off the fertilizer supply. However, production of poultry for meat (broiler chickens) became popular in the Nishi-Awa area from around 1970, and today the chicken manure generated by poultry farms is processed into fertilizer to use in the sloping fields, creating a new area-specific recycling-based system for preparing the soil for cultivation.

Of especial note is the launch in 1994 of the "Mima Compost Corporation" comprising 13 organizations, including local government bodies (Mima City and Tsurugi Town), JA, local poultry agricultural cooperatives, and private-sector businesses, which led to the large-scale production of chicken manure fertilizer (compost) (Photo 24). Today, recycling-based agriculture is carried out on the sloping fields under

a stable system of fertilizer supply, with approx. 128 tons of fertilizer used on sloping fields in Mima City and Tsurugi Town in fiscal 2015 [JA Mima 2015].

iii) Move towards cross-industry collaboration and branding in order to raise the value of agricultural products

For farmers, cross-industry collaboration—which also involves food processing, distribution, and sales—is useful in terms of raising the added value of agricultural products and securing farm profits, and various efforts towards cross-industry collaboration are also being pursued in the Nishi-Awa area. Moreover, income from "rural bed-and-breakfasts" is also leading to an increase in farmers' income, playing a part in the perpetuation of agriculture. Such activities are gaining attention as efforts for continuing farm operation in areas with unfavorable conditions.

[Cross-industry collaboration]

Many of the crops produced in sloping fields are processed and/or sold by regional farmers' groups or local businesses. Various processed foods are produced—glutinous *mochi* cakes or Japanese-style sweets made with grains, cakes made with buckwheat, and juices and jams or *ponzu* dressing made with *yuzu* (*Citrus junos*) and these products are sold at local farmer's markets and other outlets, as well as on the Internet, and enjoy many repeat customers.

Photo 25. Fujinosato-kobo

The lifestyle enhancement group "Fujinosato-kobo" (Photo 25) procures raw ingredients such as grains, konjac potato, and edible wild plants from local residents and then sells their processed products at local farmers' markets and food stores as well as department stores in the Kyoto, Osaka, and Kobe areas, garnering firm support from consumers both in and outside the Nishi-Awa area.

These activities contribute tremendously to increasing the incomes of raw ingredient producers as well as the securement of employment in the Nishi-Awa area.

[Branding]

Buckwheat flour and buckwheat processed goods made from unmilled native buckwheat grown in the Nishi-Awa area have been registered by Tokushima Prefecture under the trademark "Sora-no-Soba," with the prefectural government and local region working together to promote the creation of product brands (Photo 26). In addition to

Photo 26. *Sora-no-Soba*

"Sora-no-Soba" being sold as a product and served at local restaurants, experiencing buckwheat noodle making is popular amongst visitors.

Furthermore, there are two types of *goshuimo* potato, red and white, and so it has been given the name *Genpeiimo* (Photo 27) as a salute to the colors of the flags of the Genji (white) and Heike (red) clans, with JA Awa-Miyoshi registering the name as a trademark. The potato is now being sold as a local brand and has deep-rooted popularity.

Photo 27. Local brand *Genpeiimo*

In this way, crops produced through sloping land agriculture are contributing to increases in farmers' incomes as well as the invigoration of the local economy through efforts towards cross-industry collaboration and branding.

iv) Agriculture as a tourism resource providing a forum for "exchange"

The outward appearance of the sloping land settlements in the Nishi-Awa area—comprising sloping fields, grasslands, traditional Japanese-style houses, and mountain forests—create a distinctive agricultural village landscape that is even referred to as "the original landscape of Japan." According to Asian cultural researcher Alex Arthur Kerr, this magnificent scenery presents "another world, like Shangri-La," and has in recent years entranced many tourists from not only throughout Japan but also overseas. In Tokushima Prefecture, sloping land settlements are valued as a tourism resource and the Nishi-Awa Sightseeing Area Project has been launched with the aim of creating a tourism area brand. Various groups and organizations in the Nishi-Awa area are collaborating in this project, and local revitalization is being promoted through exchange.

In particular, interest is growing in hands-on tourism (green tourism/eco-tourism) utilizing the Nishi-Awa area's agricultural industry and sloping land settlements. Currently, an increasing number of farmers are beginning to offer farm-stay services and endeavoring to double-track farm operations. Exchange and tourism activities are providing new income sources for the area and are playing a role in the perpetuation of sloping land agriculture. Hands-on experience working the sloping fields and simple yet deeply flavored local cuisine made with locally grown agricultural products are a huge attraction for visitors to the Nishi-Awa area, and in fiscal 2015 the area provided approx. 1,812 farm-stays. [Miyoshi City; 2015]

In particular, in Miyoshi City's Ochiai Village—designated by the national government as an Important Preservation District for Groups of Traditional Buildings—eight vacant houses have been restored as traditional Japanese-style thatched-roof farmhouses and opened as accommodation facilities (Photo 28). Village guides and hands-on steep slope land agriculture experience and other experiential activity programs are offered, and local cuisine catering services using locally produced agricultural products and

hands-on local cuisine cooking experience services are also provided. This hospitality utilizing the local resources of sloping land settlements is unique to the area and has attracted many tourists, with more than 2,300 visitors (10% of whom were travelers from overseas) coming to stay in the village, which has a population of around 160, in fiscal 2105 [Miyoshi City; 2015].

Photo 28. Accommodation facilities using renovated vacant houses

In this way, the landscape and agricultural culture generated by the Nishi-Awa Steep Slope Agriculture System, which has continued for more than 400 years, has tremendous value as a tourism resource and is bringing about an increase in income and farm management motivation amongst farmers.

(c) Organization and efforts aimed at passing customs/practices on to future generations

Currently, various individuals and organizations are taking parts in a range of efforts that have been initiated with the aim of perpetuating sloping land agriculture in the Nishi-Awa area.

i) Support for "new farmers"

Although their numbers are as yet small, there is an increasing number of new farmers (who have either returned to the area after living/working elsewhere or have relocated here) who are undertraining cultivation of edible wild plants and flowers utilizing the cool climate of the mountains. Accordingly, to enable these new farmers to get their farm operations up and running and become established in the area, the Nishi-Awa area, Tokushima Prefecture, and local municipalities are working together to provide support such as farm management counselling and training workshops, with experienced farmers giving inexperienced farmers and farm workers one-on-one guidance under a tutelage system (Photo 29).

Photo 29. New farm worker receiving guidance

ii) Collaboration with settlers and university students

Sora no Sato General Incorporated Association—a DMO (Destination Management/Marketing Organization) candidate—and various other organizations and groups are carrying out coordinated efforts aimed at utilizing the magnificent scenery and agricultural culture that have been nurtured by the Nishi-Awa Steep Slope Agriculture System as tourism resources. These efforts focus in particular on encouraging farmers and farm workers in sloping land settlements to accept visitors for hands-on farm-stays, as well as providing instructors in fields such as local cuisine, storytelling, and folksong singing as the government

and private citizens work together to develop strategies for the area's survival that utilize the area's regional identity.

In Ochiai Village, the Chiiori Alliance is rousing the interest of young people throughout Japan and overseas as part of efforts to maintain settlements and agriculture through the cooperation of local residents by proactively accepting young settlers to the area (Figure 10).

Furthermore, in order to have young people experience the value of the Nishi-Awa Steep Slope Agriculture System and obtain the flexible ideas and opinions of young people with an eye to the System's future perpetuation, university students from both local areas and major cities are being proactively accepted for workshops that are being conducted jointly with local residents in various locations throughout the Nishi-Awa area (Photo 30).

(*Performance up to fiscal 2016: Rikkyo University, Meiji University, Shikoku University, etc.)

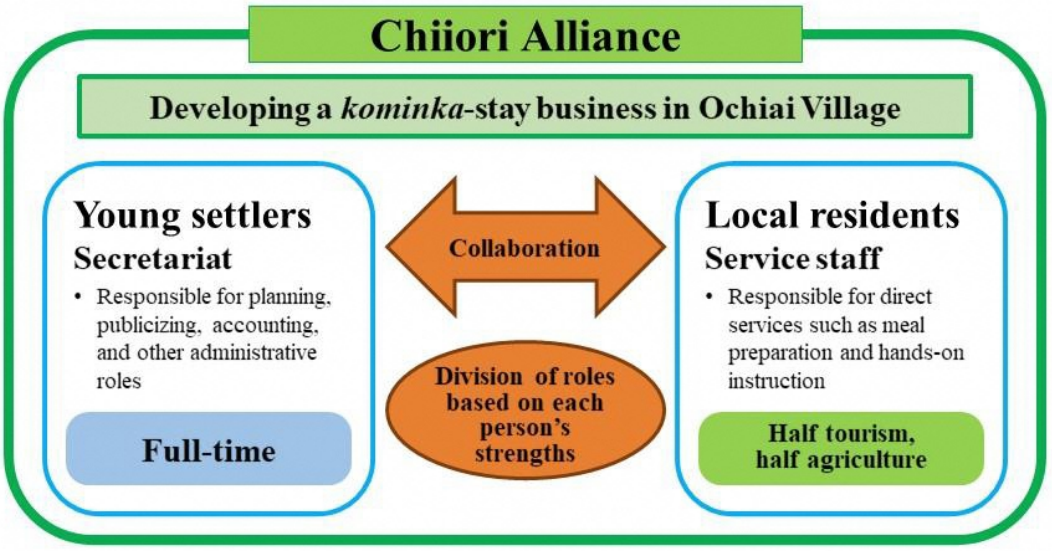


Figure 10. Structure of the Chiiori Alliance

Photo 30. Workshop being conducted in a settlement

iii) Passing on grain production to future generations

With their close connections to local annual events and festivals, many local dishes are still consumed on a daily basis today, but there are some dishes that are now only consumed at festivals and other events due to changes in diet. Food culture associated with a specific event or festival (Table 4) is also an essential element in the preservation of traditional sloping land agriculture and regional revitalization. For example, although there tends to be a decline in the number of farmers cultivating grains such as foxtail millet, Japanese barnyard millet, and proso millet, many people in the area say that they cannot welcome in the New Year without eating *zakkoku-mochi*.

The Iya Grain Producer Association was organized as a result of these feelings towards food culture, and is providing opportunities for promoting grain production on sloping land.

Moreover, local cuisine centered on grains is becoming an important element of tourism centered on farm-stays, which are becoming popular in the Nishi-Awa area. The unique food culture and preserved landscape that cannot be seen elsewhere are extremely popular with tourists, and their value as tourism resources is high. In particular, hands-on learning tourism such as school trips provide valuable opportunities for people from urban areas to learn about the importance of "local production for local consumption" as well as the unique culture of the Nishi-Awa area, and is thereby also generating educational effects.

Table 4. Annual events and local dishes

Month	Event	Local dishes using traditional food ingredients
January	New Year	Soup with glutinous grain-rice cakes; *sobagome zosui* (buckwheat porridge)
February	*Setsubun*	Buckwheat noodles; boiled black beans and konjac potato
March	*Momo-no-sekku*; Spring equinox	Wrapped sushi rolls with seasonal vegetables; potato dumplings, *botamochi* rice cakes
April	*Hama-no-sekku*, Dolls festival, Flower festival	Boiled Asian royal fern/giant butterbur; edible wild plants deep-fried in batter, boiled bracken fern soup with egg
May	*Tango-no-sekku* (Children's Day)	Dried daikon radish soup; adzuki bean rice; sushi rice topped with egg, shrimp, and vegetables
June	Rice planting	Boiled *goshuimo* potatoes; *uri-no-aemono*; giant butterbur boiled in soy sauce
July	Summer festival, *Tanabata* festival, *mushi-kito*	Cucumber pickled in mustard, roasted beans; *goshuimo* potato sautéed in miso
August	*O-bon*	Bottle gourd *somen* noodle soup; *zuiki-ae*; goshuimo potatoes with *dengaku* glaze
September	*Kuri-sekku*, *Higan*	*Ohagi* rice cakes; grain-rice cakes; chestnut-adzuki rice; *rikiimo*
October	Autumn festival	Adzuki rice; taro stems dressed with vinegar and miso, *nizuke-no-kushisashi*, sweet potato deep fried in batter
November	*Oinokosan* (to pray for an abundant crop)	Buckwheat noodles; cucumber pickled in mustard; i*noko* sushi, potato dumplings; boiled taro; boiled radish
December	Winter solstice, New Year's Eve	Boiled pumpkin; *yuzu*-miso; *dekomawashi*; *sobagome zosui* (buckwheat porridge); buckwheat noodles

(2) Agro-biodiversity

(a) Agro-biodiversity and the ecosystem

i) Diversity of animals and plants that live in grasslands

The grasslands (*kayaba*) (Table 5) maintained by sloping land settlements in order to secure a supply of *kaya*, which is essential for cultivating sloping fields, play an important role as a home to many plants and animals.

According to a survey conducted on sloping fields and the biodiversity of nearby grasslands at a total of 41 points in 19 districts within the Nishi-Awa area (altitude 247 m – 807 m) [Shikoku Institute of Natural History; 2015], some 282 species of plants have been confirmed, including two included in the Red Data Book [Ministry of the Environment; 2017] of threatened species: *shikoku-fukujusou* adonis (*Adonis shikokuensis*) (Photo 31) and *funabarasou* dogbane (*Vincetoxicum atratum*) (Photo 32) (both classified as "Vulnerable").

Table 5. Area (m^2) of grasslands in main settlements

Fuchimyo	66,857.02
Moritoo	10,592.11
Chichinogi	4,137.43
Ochiai	29,738.13
Nakaue	11,417.79
Kurishito	21,752.27
Kiriu	12,179.08
Akamatsu	85,226.41
Akadani	4,287.55
Keka	159,569.05
Nishijo (Gomyo)	10,886.70
Izumino	34,505.30

These rare plants are plants that are dependent on and grow in the bright environments created through human intervention in the form of regularly cutting the *kaya*. Accordingly, in addition to the diversity of plants that grow in the grasslands (*kayaba*) (Photo 33), the sloping fields also provide an important habitat for many insects, as well as birds that feed on them and various other animals.

Photo 31. *Shikoku-fukujusou* adonis (*Adonis shikokuensis*)

Photo 32. *Funabarasou* dogbane *(Vincetoxicum atratum*)

Photo 33. Grasslands (*kayaba*)

Photo 34. Eurasian sparrowhawk (*Accipiter nisus*)

Some 241 species of insects have been recorded, and the presence of species regarded as native to grasslands with Chinese silvergrass, such as the *tsumaguro-hime-kometsuki-modoki* beetle (*Anadastus praeustus*) and *kurotoge-hamushi* beetle (*Hispellinus moerens*), has been confirmed. Amongst these insects, the presence of rare species has also been confirmed, included *akamadarasenchi kogane* beetle (*Ochodaeus maculatus waterhouse*), which is rare throughout Japan, and lillacine bushbrown beetle (*Mycalesis Francisca Perdiccas*), which is classified as "Vulnerable" on Tokushima Prefecture's Red List of threatened species.

With regard to birds, 28 species have been confirmed in the grasslands areas, including many small birds that prefer using grasslands or community-based woodland areas such as meadow bunting (*Emberiza cioides*), rustic bunting (*Emberiza rustica*), gray wagtail (*Motacilla cinerea*), brown-eared bulbul (*Hypsipetes amaurotis*), and Japanese nightingale (*Horornis diphone*). Furthermore, there has also been confirmation of Eurasian sparrowhawk (*Accipiter nisus nisosimilis*) (classified as "Near-threatened"; Photo 34), which mainly hunts small animals in open grasslands, and so amongst the many forests and woodlands, the managed grasslands environment provides valuable feeding grounds for the Eurasian sparrowhawk.

Amidst nationwide concerns regarding the decrease in grasslands (meadows) and other secondary grasslands due to the impact of depopulation, and the corresponding decrease in the diversity of flora and fauna living there [Annual Report on the Environment in Japan 2016], the maintenance of grasslands in the Nishi-Awa area is preserving a large number of animals and plants, including endangered species.

(b) Ecosystem functions related to world environment issues

i) Indigenous varieties

The small-quantity large-variety cultivation, that has been perpetuated under the Nishi-Awa Steep Slope Agriculture System and food culture featuring grains and traditional vegetables, have passed down the genetic resources of many native varieties to the present. The sloping fields truly play the role of a “gene bank” stocking genetic resources for valuable native grain and vegetable varieties that continue to be passed down in Japan.

[Grains]

Photo 35. (From left) Foxtail millet, proso millet, Japanese barnyard millet, great millet, finger millet, and buckwheat

Cultivation of grains as important crops supporting staple foods has long been popular in the Nishi-Awa area, where rice planting is difficult, and even today various grain varieties continue to be cultivated.

Amongst the grains cultivated in Japan, those cultivated in the Nishi-Awa area include foxtail millet (*Setaria italica*), proso millet (*Panicum miliaceum*), Japanese barnyard millet (*Echinochloa utilis*), great millet (*Sorghum bicolor*), and finger millet (*Eleusine coracana*), as well as buckwheat (*Fagopyrum esculentum*) (Photo 35). In Japan, there are few cases of such a large variety of grains being cultivated in one place and preserved while being cultivated up to the present day.

Moreover, because a wide variety of grain has been continuously cultivated over a long history dating back to the shifting cultivation (slash-and-burn) era, one grain variety may have multiple lineages (Table 6). Here a diversity of lineages has been preserved, and lineage classification according to growth characteristics has confirmed 19 proso millet lineages, 3 foxtail millet lineages, 6 great millet (sorghum) lineages, and 1 lineage each for Iya Japanese barnyard millet and finger millet [Tokushima Prefecture Regional Food Industry Advanced Business Performance Report 1994].

Enabling observation of multiple grain species and varieties that have been cultivated in this way since ancient times, the Nishi-Awa area plays an extremely important role in terms of exploring the roots of agricultural culture in Japan.

Table 6. Kernels of various grain varieties

Survey of the amount of rough protein in the kernels of grain varieties and the growth of each variety

Name of lineage	Rough protein in kernel (%)	Growth characteristics	Start of sprouting (Month/day)	Sprouting period (Month/day)	Maturing period (Month/day)	Flag leaf color	Husk color
Kokibi Ikeda 1	10.87	Original	7/31	8/4	8/25	Green	Green
Kokibi Ikeda 2	10.19	Early-ripening; dark yellow color	7/31	8/4	8/26	Green	Green
Kokibi Ikeda 3	10.29	Kernel color: white	8/3	8/6	8/31	Green	Green
Kokibi Ikeda 4	11.62	Very fast growth long stem	7/14	7/17	8/10	Yellow green	Green
Kokibi Ikeda 5	10.58	Very fast growth short stem	7/14	7/17	8/10	Yellow green	Green
Kokibi Ikeda 6	10.11	Kernel color: dark yellow	8/1	8/6	8/31	Green	Green
Kokibi Ikeda 7	10.26	Kernel color: yellow	8/1	8/6	8/31	Green	Green
Kokibi Ikeda Black 1	10.82	Kernel color: black	7/31	8/3	8/25	Green	Grey-green
Kokibi Ikeda Black 2	10.97	Kernel color: brown	7/31	8/3	8/25	Green	Grey-green
Kokibi Ikeda Black 3	10.38	Kernel color: yellow	7/31	8/3	8/25	Green	Grey-green
Kokibi Miyoshi 1	9.94	Original	7/26	7/30	8/23	Green	Green
Kokibi Miyoshi 2	9.60	Early-ripening	7/26	7/30	8/23	Green	Green
Kokibi Miyoshi 3	10.83	Kernel color: white	7/26	7/30	8/23	Green	Green
Kokibi Miyoshi 4	12.03	Kernel color: yellow	7/26	7/30	8/23	Green	Green
Kokibi Anabuki 1	11.28	Original	7/31	8/4	8/25	Green	Green
Kokibi Anabuki 2	10.59	Kernel color: yellow	7/31	8/4	8/25	Green	Green
Kokibi Anabuki 3	11.04	Kernel color: white	7/31	8/4	8/25	Green	Green
Kokibi Iya 1	10.41	Original	7/31	8/4	8/25	Green	Green
Kokibi Iya 2	9.27	Large tip	7/31	8/4	8/25	Green	Green
Awa Ikeda	6.41		8/14	8/16	9/13	Light purple	Light yellow
Awa Iya	8.29		8/10	8/12	9/3	Purple	Yellow
Awa Kizawa	9.03		8/7	8/9	8/30	Purple	Yellow
Shikokubie	5.06		8/12	8/20	9/28	Green	Grey
Hie Iya	7.43		8/4	8/11	9/20	Green	Grey
Takakibi Ikeda 1	8.21	Original	8/12	8/14	9/6	Green	Red-brown
Takakibi Ikeda 2	8.40	Late-ripening	8/12	8/14	9/6	Green	Red-brown
Takakibi Iya	9.58	Original	8/3	8/6	9/2	Green	Red-brown
Takakibi Anabuki 1	8.81	Early-ripening	7/30	8/3	8/29	Green	Black
Takakibi Anabuki 2	7.76	Original	7/30	8/3	8/29	Green	Black
Takakibi Anabuki 3	8.69	Late-ripening	7/30	8/3	8/29	Green	Black

Table 7. Grain lineages preserved at the Tokushima Agriculture, Forestry, and Fisheries Technology Support Center

Name of crop	Lineage	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Kokibi (small millet)	Ikeda 4			○			○				○			○	
	Ikeda Black 1	○			○			○				○			○
	Miyoshi 2	○			○			○				○			○
	Iya 2			○			○				○			○	
	Niiyama Senbatsu		○			○			○				○		
	Norouchi			○			○				○			○	
Awa (Foxtail millet)	Ikeda	○			○			○				○			○
	Iya	○			○			○				○			○
	Kizawa			○			○				○			○	
Shikokubie (Finger millet)	Ikedacho Umaji	○	○			○			○				○		
Hie (Japanese barnyard millet)	Iya		○			○			○				○		
Takakibi (sorghum)	Ikeda 2			○			○				○			○	
	Iya	○			○			○				○			○
	Anabuki 2		○			○			○				○		
	Hiruma			○			○				○			○	

The Tokushima Agriculture, Forestry, and Fisheries Technology Support Center has selected 15 lineages of 5 outstanding local grain varieties (Table 4) and characteristic grain varieties and is carrying out appropriate cultivation for preservation at experimental stations. In addition, the National Agriculture and Food Research Organization (NARO) Genebank Project is preserving 64 lineages of Tokushima Prefecture grains (11 buckwheat lineages, 16 proso millet lineages, 5 Japanese barnyard millet lineages, 13 finger millet lineages, and 19 foxtail millet lineages).

In the case of finger millet, continued cultivation was under threat. However, in 2016 a producer association was launched and efforts aimed at perpetuating finger millet production as well as passing down and commercializing food culture have been initiated, with both government and private organizations working proactively to preserve valuable genetic resources.

[*Goshuimo* potatoes]

In the Nishi-Awa area, native potatoes cultivated in the area since ancient times have long been grown as a forecrop for buckwheat and used by farmers for home consumption, who home-produce their seeds. There are both red-skinned and white-skinned lineages, and the potatoes go by a variety of names, including *goshuimo, goshuuimo, goshimo, okuimo, iyafudo,* and *hodoimo*. Characterized by their rich flavor, small size, and firm texture, these potatoes are perfect for *Dengaku* (dish where tofu/vegetables are skewered and coated in a miso glaze).

However, *goshuimo* cultivated on plains or areas with different climatic conditions sometimes have a different taste and shape. Furthermore, because product quality was not uniform across the Nishi-Awa area, the Tokushima Prefecture Agricultural Experimental Station (now the Tokushima Agriculture, Forestry, and Fisheries Technology Support Center) classifies the potato lineages and selects excellent lineages for further commercialization. Production of two lineages propagated using micro tubers (small seed potatoes created through tissue culture) is carried out, and *goshuimo* potatoes that meet cultivation area and shipment standards are sold under the brand name *Genpeiimo*.

ii) Sustainable agriculture coexisting with Japanese honey bees (*Apis cerana japonica*)

The Japanese honey bee (*Apis cerana japonica*) is a subspecies of the Eastern honey bee (*Apis cerana*) native to Japan and is a different subspecies from the Western honey bee (*Apis mellifera*), which is the most common honey bee in modern apiculture. The Japanese honey bee has been continuously used in apiculture in mountain areas of Wakayama Prefecture and Ehime Prefecture.

There have been no previous reports on the ecology of these honey bees due to a lack of research, but apiculture has been carried out traditionally in the Nishi-Awa area. The degree of domestication (cultivation) of Japanese honey bees is low, and they gather the pollen of a variety of flowers.

Photo 36. Scene from *Kaya to kurasu tenku no sato* (“Village in the sky living with *kaya*”)
Source: NHK materials

Photo 37. Contributing to the pollination of a diversity of plants
Source: NHK materials

In the Nishi-Awa area, appropriate management of *kaya* grasslands and the System of cultivating a wide variety of crops has maintained the honey bees’ habitat. At the same time, people keep bees partly for fun while carrying out cultivation of a diversity of varieties that are propagated through pollination by insects, thereby maintaining a symbiotic environment with the honey bees (Photos 36 and 37).

(c) Biodiversity list

(Attachment 2)

(3) Local and traditional knowledge systems

(a) Techniques and management system for using sloping fields sustainably

i) Prevention of soil erosion through the use of dried kaya (Chinese silvergrass)

Photo 38. Preventing soil erosion by covering the ground with *kaya*

Photo 39. *Kaya* laid in furrows

In the Nishi-Awa area, a unique technique is used to protect the subsoil and continue agricultural activities whereby *kaya* (Chinese silvergrass and other grasses) from grasslands are dried and cut into short lengths and plowed into the soil as well as laid on the soil surface (Photos 38 and 39).

The work involved in applying the kaya to the soil is carried out continuously throughout the year: (1) in autumn and winter, Chinese silvergrass and other grasses are gathered from grassland areas secured within the settlement; (2) the cut grasses are transported to near the sloping fields, where they are stacked in conical shapes to dry; (3) the dried *kaya* is cut and then plowed into all of the sloping fields land twice a year before planting, mainly in spring and summer; and (4) after planting, the dried *kaya* is laid in the furrows as required in order to protect the crops from frost damage and dryness.

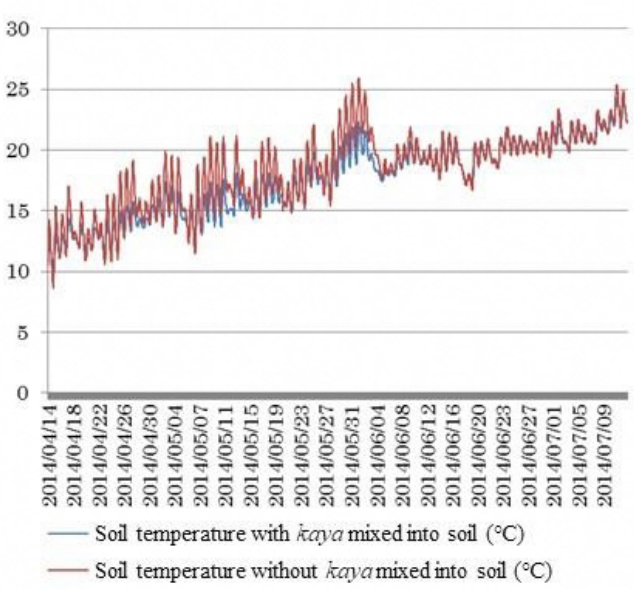


Figure 11. Trends in soil temperatures at field experiment sites

In terms of soil ecology, this application of *kaya* has the effects of (1) preventing erosion and runoff of soil and fertilizer; (2) supplying organic matter; (3) regulating soil temperature, keeping the soil at a uniform temperature (Figure 11); (4) preserving soil composition; (5) preserving the soil's moisture content; and (6) controlling weed growth, etc.

To cut the *kaya*, a farm tool called *oshigiri* (straw cutter) is used. This tool is fitted with blades facing upwards, and the *oshigiri* used in the Nishi-Awa area are characterized by the fact that they have legs attached to enable the cutting work to be carried out efficiently by keeping the cutter on a horizontal level, even in sloping fields (Photo 40).

Furthermore, in the Nishi-Awa area the conical stacks of *kaya* (Photo 41) are referred to as *koeguro* or *guro*. These can be observed all year round, and are an important element of the unique landscape of sloping land settlements.


Photo 40. *Oshigiri* (straw cutter) with legs


Photo 41. *Kaya* straw in conical stacks

ii) Techniques for creating/restoring arable soil

Very sharp and heavy agricultural tools such as *tonga*, which resembles a *tsuruhashi* (pickaxe), and *hitoribiki* are used to till sloping fields. The soil in the Nishi-Awa area contains a large number of pebbles from crystalline schist. Using sharp, heavy tools to cut deeply into the soil break these pebbles up into tiny pieces, newly creating silt and clay that are appropriate for cultivation.

Table 8 and Figure 12 show the results of a survey of the structure of pebbles in sloping fields in Ichiukiriu Village in Tsurugi Town. These results indicate that the closer the pebbles are to the surface of the soil, the smaller they are. The crystalline schist comprising the pebbles breaks easily into plates, which become even more brittle due to weathering. By using farm tools such as *tonga* and *hitoribiki* to deeply till the soil, the people of the Nishi-Awa area naturally break up the pebbles in the earth, creating soil that is suitable for cultivation.

Table 8. Structure of pebbles at sloping field experimental sites (Ichiukiriu District, Tsurugi Town)

Grain diameter	Top left Layer A	Top left Layer B	Top left Layer C	Bottom left Layer A	Bottom left Layer B	Bottom left Layer C	Center Layer A	Center Layer B	Center Layer C	Top right Layer A	Top right Layer B	Top right Layer C	Bottom right Layer A	Bottom right Layer B	Bottom right Layer C
31.5 mm or more	110	0	140	0	83	56	0	0	107	79	0	89	222	251	354
16 mm – 31.5 mm	140	166	316	32	16	368	243	316	510	321	311	595	254	722	530
8 mm – 16 mm	266	345	337	298	378	627	655	538	527	430	572	608	559	493	608
4 mm – 8 mm	514	540	357	440	815	465	573	510	385	419	522	494	605	483	494
2 mm – 4 mm	566	676	248	551	383	357	553	346	226	439	439	322	506	300	322
Less than 2 mm	976	956	395	1062	548	525	685	389	275	673	579	484	675	403	484
Total	2,572	2,683	1,793	2,383	2,223	2,398	2,709	2,099	2,030	2,361	2,378	2,592	2,821	2,652	2,792

Notes: Layer A: Soil surface to -20 cm; Layer B: -20 cm to -60 cm; Layer C: -60 cm to -100 cm

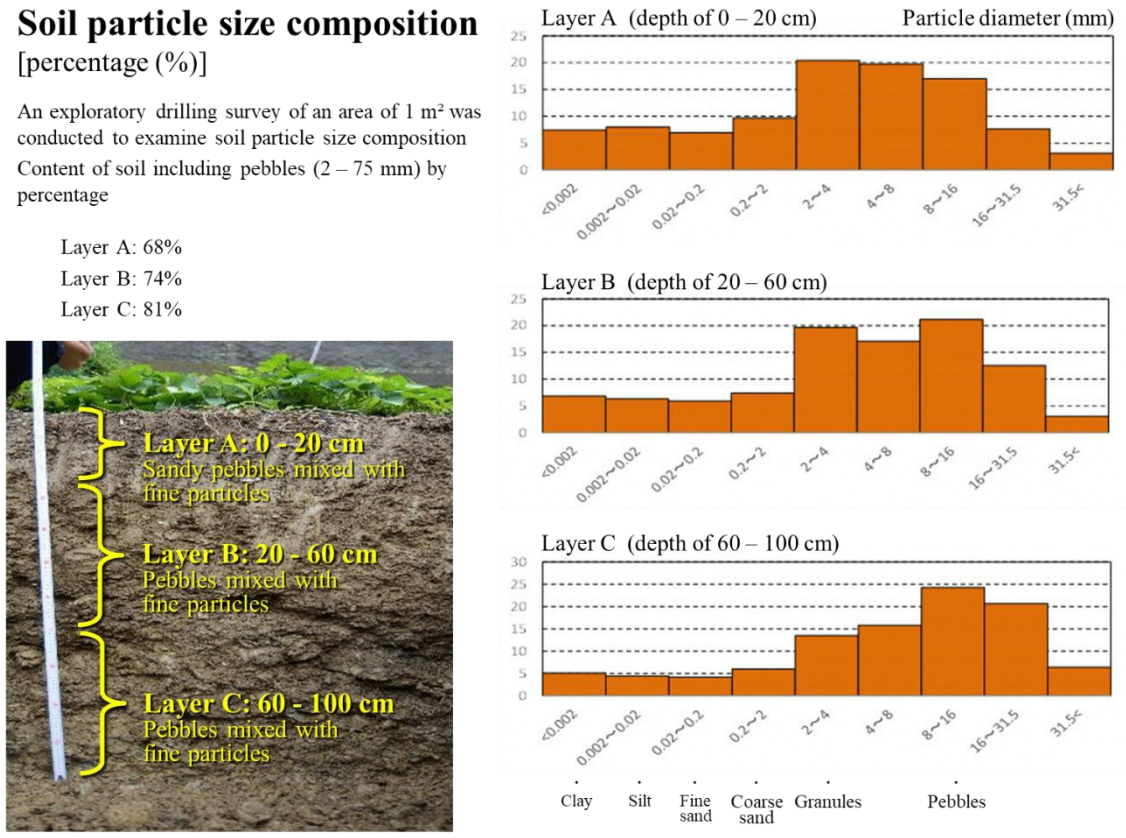


Figure 12. Soil particle size composition

Farmers also use a technique called *tsuchiage* (“lifting the soil”) to move soil washed down the field in heavy rains back to the top of the field. Using a hoe called a *sarae*, which has a shape unique to the Nishi-Awa area, farmers begin at the top of the field and work horizontally, moving the surface soil up approx. 60 cm by hand. This work is carried out twice a year, at planting time. Since the work requires human strength, it requires enormous labor; however, it is essential for preventing soil erosion due to heavy rain and gravity as well as for restoring the soil (Photos 42 and 43).

The heavy, sharp *tonga*, *hitoribiki*, and *sarae* are unique farm tools that can only be seen in the Nishi-Awa area. The people of this area use these tools to create and restore subsoil, as they continue to carry out agriculture on sloping fields.

Photo 42. Photo of *sarae*

Photo 43. Carrying out *tsuchiage* using *sarae*

Thus, these techniques for breaking up pebbles in the soil during tillage and restoring the fields by moving soil that has run down the field back to the top are the fruits of knowledge and practical application cultivated over many years, and have supported the sustainable use of steep slope land.

iii) Stonework techniques

As a general rule, the fields in slope land villages use the mountain slopes as is, without building terraces, but depending on the topography, stone walls are built in order to lessen the steep incline and reduce the impact of soil erosion. This lessens the incline of the slope, enabling work to be carried out more efficiently and safely as well as weakening the erosive capacity of heavy rain by shortening the length of the slope. Furthermore, effective techniques utilizing the radiation heat reflected off the stone walls have also been incorporated into the cultivation of tomatoes and other vegetables.

Stonework techniques are also used in water channels for effectively draining rainwater in a longitudinal direction on sloping fields, as well as in preparing sites for constructing farmhouses (Photos 44 and 45).

Photo 44. Stone walls supporting agricultural land and houses

Photo 45. Stone hedge-walls

Photo 46. Stonework workshop

The stones used in stone walls are rocks processed from crystalline schist and are assembled into walls using skillful techniques that have been passed down over generations. Essential to the daily living of people in sloping land settlements, stonework techniques do not require large scale repairs, even in the event of a natural disaster, and can be repaired by hand—thereby enhancing the villages' ability to recover from disaster. These traditional stonework techniques are being passed on to future generations by local craftsmen, and stonework workshops for university students and other activities are also being carried out with the aim of further perpetuating these skills (Photo 46).

(b) Sustainable and traditional knowledge provided through the System

i) Ecological, sociological, and economic value and resilience

In the Nishi-Awa area there are sloping land settlements of varying sizes. Since sunlight, slope incline, altitude, soil, and temperature all vary depending on the location, crops that are suitable for the cultivation conditions are selected in accordance with the site conditions of the settlement. Moreover, there are large differences in altitude even within the one settlement, with differences of up to 470 m in some settlements (Photo 47). Consequently, there are slight micrometeorological and soil moisture differences depending on the position of the field, and so even within the one settlement, cultivation of crops is allocated efficiently from the perspective of selecting suitable crops for the land.

Photo 47. In Akamatsu Village, there is an altitude difference of 470 m

For example, residents in a settlement have adapted to environment changes—such as amount of sunshine, good/poor soil drainage, and the impact of wind—using knowledge accumulated through experience and innovations. These are unique "Nishi-Awa" techniques developed through intensive use of land in locations where housing and cultivation land are located within the same sloping land area.

In particular, because there is a difference in harvest periods due to differences in altitude (Figure 13), it is customary for farmers to share their produce with each other. Moreover, the level supply of produce to farmers' markets also enables stable prices and has a mutual-aid function that provides food with high resilience that is excellent for balancing supply and demand.

Moreover, because small-scale sloping fields are scattered throughout each settlement area, the settlement is never hit with large-scale damage all at once, even when a major natural disaster occurs, such as typhoons, heavy rains, or heavy snow on the mountainsides. In addition, any damage can be easily be repaired by hand, making the settlements highly resilient to disasters. Furthermore, due to the differences in altitude between settlements as well as between *hinoji* (south-facing land) and *kageji* (north-facing land), etc., the harvest periods and crops suitable for cultivation differ from settlement to settlement (Figure 13; Table 9), and it continues to be customary for farmers in different settlements to share their harvested crops. This behavior has the effect of supplementing poor crops resulting from unfavorable weather conditions or various circumstances, thereby distributing risk.

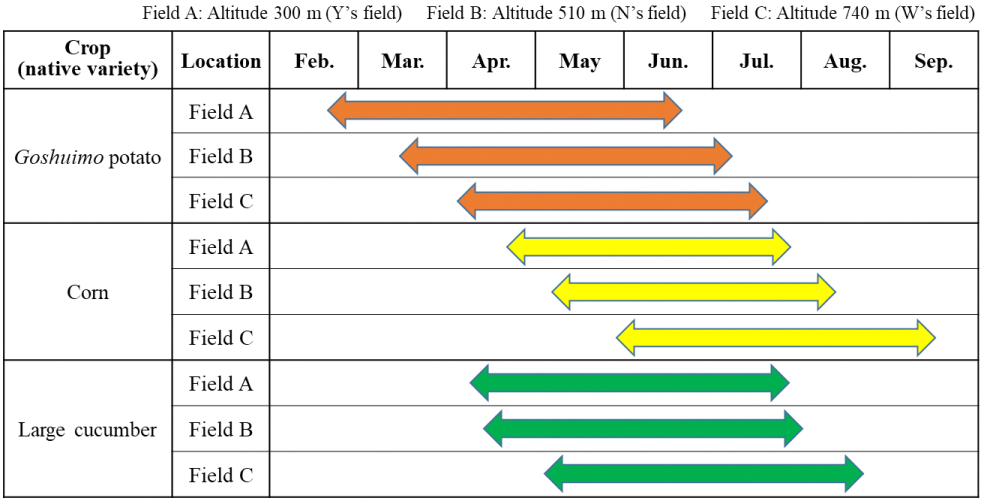


Figure 13. Examples of cultivation records for the Akamatsu-Omune settlement (Tsurugi Town)

Table 9. Crops seen in selection of suitable crops for suitable land

Land environment	Crops
Hinoji (south-facing slope fields)	Sweet potatoes, beans, tomatoes, etc.
Kageji (north-facing slope fields)	Potato varieties, Royal fern, etc.
Gentle slope fields	Eggplants, taro, etc.
Steep slope fields	Buckwheat, grain varieties, etc.

(4) Cultures, value systems, and social organizations

(a) Culture supporting the System

i) Agricultural tools supporting soil management techniques

The existence of unique agricultural tools appropriate for sloping land is essential for enabling sustainable soil management under the Nishi-Awa Steep Slope Agriculture System.

For tilling the sloping land and moving (lifting) soil, various unique farm tools are used, beginning with the six-pronged *sarae* hoe and including *hitoribiki* and *sasaba* (Photos 48 and 49). These tools are made by local blacksmiths in the Nishi-Awa area tailored to the requirements of farmers, giving consideration to the gradient angle of the slope and the constitution (physique) of the user.

In the Nishi-Awa area, farm tools wear out quickly due to the work of deep tilling soil that contains many pebbles, and so it is essential to repair or replace the blade tips. The steep slope agriculture system is therefore supported by the existence of these unique agricultural tools as well as blacksmiths.

Photo 48. *Hitoribiki*

Photo 49. *Sasaba, futaba, tonga*

ii) Wealth of preserved food culture

The large diversity of grain, vegetable, and fruit varieties produced in sloping land fields supports the daily lives of the people in these settlements during the harsh winter and all year round in the form of preserved foods prepared by each household through such methods as sun-drying, or are shipped for sale as richly flavored and nutritious regional specialties.

For sun-drying, the produce is hung from a ladder-like wooden frame called a *hade*, which is located on the grounds of the house (Photo 50). A cold, dry wind known as the *Tsurugi-san oroshi*, which blows from around mid-November until the end of March, is perfect for sun-drying produce, and “sun-dried persimmon” and “sun-dried potatoes” (Photo 51) are two well-known local specialties. The sight of these fruits and vegetables swaying in the wind on the *hade* has become an integral part of the winter landscape of sloping land settlements.

In order to store potatoes, farms have storage pits, called “potato pits,” dug to a depth of approx. 2 m either in the floor of either the farmhouse or storehouse. These pits are used to store not only *Solanum tuberosum* potatoes, but also sweet potatoes and taro to protect them from freezing in the winter. “Potato pits” are lined with layers of wheat straw or *kaya* and chaff and bamboo poles with holes are also inserted to prevent breathing impediments during storage. These techniques maintain the temperature and humidity in the pit at a certain level, which also contributes to the preservation of seed potatoes for the following year (Photo 52).


Photo 50. Daikon radishes drying on a *hade*


Photo 51. Sun-dried potatoes


Photo 52. Potato pit

(b) Community and customs related to the System

i) Customs and practices

In the Nishi-Awa area, a diversity of agricultural festivals and events has been passed down over generations in each district as important cultural activities supporting sloping land agriculture. These not only include ritualistic aspects such as praying for rain, but also have the important function of sustaining and strengthening relationships amongst the local residents involved in sloping land agriculture. Looking forward to these festivals and events has provided farmers with motivation for continuing what at times can be arduous farm work.

[Rain dances]

“Rain dances” have been passed down over generations as a form of prayer for rain to prevent prolonged dry weather in order for crops to grow. The origins of the “Nishi-Iya Kamishiro-odori Dance,” (Photo 53) which is performed in Iya Village in Miyoshi City, are said to date back more than 1,000 years to the Heian era, and the dance is well-known as a bewitching and courageous dance. The dance was registered as a national Important Intangible Folk Culture Asset in 1976, and has become an important event for invigorating the local community.


Photo 53. Nishi-Iya Kamishiro-odori dance

The history of the “Ichiu Amagoi-odori Dance” held in Tsurugi Town dates back to the first half of the

19th century. Although temporarily suspended, the "Ichiu Amagoi-odori Dance Preservation Society" was formed in 1968 and the event was resurrected. The dance was designated as a Tokushima Prefecture Important Intangible Folk Culture Asset in 1973, and today it is taught to local junior high school students as part of their comprehensive school studies and is performed at cultural festivals, musical concerts, and various other events.

[*Oinokosan*]

Oinokosan (Photo 54) is an agricultural festival. This ritual is held on the day of the boar in the 10th month (month of the boar) according to the old Japanese calendar to give thanks for that year's harvest and to pray for a bountiful harvest the next year and for the prosperity of all the agriculture households. Specifically, children visit each household in the settlement and hit the walls around the yard with *warabote* (taro stems wrapped in straw and tied with rope) while singing the "*Oinoko* song," then strike the ground in the garden with a *tatezuki* (a tool with multiple vines tied to a section of tree trunk measuring approx. 40 cm in length in a radial pattern) to pray for an abundant harvest.

Photo 54. *Oinokosan*

This ritual also died out at one time in various settlements as depopulation progressed, but in recent years its cultural value and benefits as a means of strengthening ties amongst local residents has been reevaluated, and there are now moves to reestablish this practice. For example, in Sarukai Village in Tsurugi Town, efforts aimed at obtaining GIAHS designation for the Nishi-Awa Steep Slope Agriculture System prompted a reawakening of awareness of the area's treasures, and in 2015 elementary school students resurrected *Oinokosan* after a 25-year hiatus, and the ritual has now been incorporated into comprehensive study materials.

[Work songs]

In sloping land settlements, various "work songs" related to agricultural work have been passed down in each area over generations. These songs are said to be techniques practiced since ancient times for adding color to monotonous, arduous work so that the work can be carried out enjoyably. There is a diversity of traditional songs, including *konahiki-bushi*, which are sung when grinding grain into flour (Photo 55); *koekari-uta*, which are sung when cutting *kaya* grasses; *nihakobi-bushi*, which are sung when carrying heavy loads of cut *kaya* grasses, etc.; and *kibiki-uta*, which are sung when cutting down trees with a saw.

(*Koekari-bushi*)
Waking or sleeping, we go cutting, cutting
If only no trees or grasses grew in the mountains
Mountains! Mountains! You are hateful!
But beautifully colored flowers bloom in the mountains

Iya konahiki-bushi is a song sung to keep workers from falling asleep while rotating the stone mill for grinding buckwheat when working at night. This song continues to be passed on by local singers and is well-known as one of Japan's representative folksongs. The *Iya Konahiki-bushi* Japan No. 1 Contest (Photo 55) is held every year in autumn.

Photo 55. Iya Konahiki-bushi Japan No. 1 Contest

(Iya konahiki-bushi)
Iya's vine bridges
Like spiders' webs
Swaying gently, despite no wind
No wind, no wind, despite no wind
Swaying gently, despite no wind

ii) Maintenance of community functions through *o-do* (temple hall) culture

O-do (temple halls) are places within each settlement for exchanging information, providing mutual aid, holding memorial services for ancestors, and praying for abundant harvests. Amongst the oldest temple halls are ones that house Buddhist statues inscribed with the year 1290 (Shoo 3 on the Japanese calendar), and a survey conducted in 1981 found there to be some 425 *o-do* halls in the Nishi-Awa area [*Awa no o-do*; 1988]. Through gatherings for various rituals such as *gomadaki* (Buddhist rite of burning wooden sticks), *daishiko* (meetings of groups of Buddhist followers under the guidance of a temple), *juzumawashi* (praying with Buddhist rosary beads), and *Do-no-kuchiake* ("opening of the hall door"), the spirit of mutual aid, which is essential for sloping land agriculture, is cultivated (Photo 56).

Co-existing with nature, the people of the Nishi-Awa area have a system of mutual aid, known as *ii*, whereby people live side-by-side with their neighbors in a spirit of cooperation, and *temagae* practices of mutually lending or contributing labor for rituals and events held throughout the year have long been carried out. Management of water resources, which are essential for everyday living; grasslands management; replacement of roof tiles; planting and harvesting of crops—these have all been possible because of the practice of *temagae* mutual cooperation. Even today, cutting grass along roads and tea-picking are collaborative undertakings, and there is a deeply entrenched custom of farmers sharing produce with others if there is any to spare after harvesting.

Photo 56. Various rituals performed at the *o-do* temple hall, located in the center of the settlement, foster a spirit of mutual aid

The above-mentioned "agricultural rituals" and "*o-do* culture" encourage the continuation of the settlement and agricultural activities by regularly bringing settlement residents together. When residents gather together, it is virtually certain that they will exchange information related to agricultural activities or exchange seeds or seedlings, etc. With this occurring on a daily basis, the continuance and preservation of valuable genetic resources is also carried out.

Protecting and passing on these religious rituals and beliefs constructs mechanisms for people to be aware of their mutual roles in everyday relationships and interactions and to help each other, thereby maintaining the magnificent landscape and abundant environment of sloping land settlements that have been passed down over from their ancestors (Photo 57).

Photo 57. (Above) Regular gathering (Above right) Repair work on the Tennichi shrine (Bottom right) Clean-up activities around the Hisayabu Hall (Tsurugi Town)

iii) Local dishes created by the System

In the long history of the sloping land agriculture system in the Nishi-Awa area, local cuisine featuring traditional crops native to the area—especially a diverse selection of grain varieties that have been popularly cultivated since the era of shifting cultivation (slash-and-burn agriculture), as well as *goshuimo* potatoes and bottle gourd—have been passed down over generations.

Efforts to perpetuate this food culture are being carried out throughout the Nishi-Awa area. For example, the Miyoshi District Living Exchange Council is carrying out such activities as compiling a book of recipes for traditional local dishes and food education in local elementary and junior high schools with the aim of educating local residents about traditional local cuisine and popularizing these dishes. Furthermore, locally grown buckwheat is supplied as an ingredient in elementary school lunches and is an established menu item every year.

[*Sobagome zosui* (buckwheat porridge)]

Of the local dishes containing grains, *sobagome zosui* (buckwheat porridge) (Photo 58) is especially famous. Using buckwheat grains as is, without grinding them into flour, this dish provides a rare and unusual way of eating buckwheat, even from a global perspective. It is said to have originated following the Genpei War, when the defeated warriors of the Heike clan hid themselves in Higashi-Iya Village and made the porridge to remind them of the capital. To make *sobagome* (buckwheat rice), buckwheat grain is boiled and salt added. The grains are then dried using the *mushirohoshi* methods; the husks removed using a grain polishing machine and the grains are then further dried. This processing is carried out after harvesting, and the buckwheat grains are a "preserved food" that can be used year-round.

Photo 58. *Sobagome zosui* (buckwheat porridge)

Buckwheat contains large amounts of phosphatidic acid, which is effective in controlling ulcers, and it has been confirmed that a large amount of epidermis remains on the buckwheat grains through joint research conducted by The Tokushima University Faculty of Pharmaceutical Sciences and Tokushima Prefectural Government Western Area General Prefectural Citizens' Bureau.

It has been confirmed through joint research conducted by The Tokushima University Faculty of Pharmaceutical Sciences and Tokushima Prefectural Government Western Area General Prefectural Citizens' Bureau that buckwheat, especially the outer skin of buckwheat grain, contains large amounts of phosphatidic acid, which is effective in controlling ulcers.

[*Zakkoku mochi* (glutinous grain-rice cakes)]

Grains such as great millet and proso millet are mixed together with glutinous *mochi* rice and other ingredients to create these rice-grain cakes (Photo 59). In the Nishi-Awa area, this dish is so well-established in the local agricultural culture and food culture that there are people who say, "We can't see in the New Year without rice cakes containing grains."

Photo 59. *Zakkoku mochi* (glutinous grain-rice cakes)

[*Dekomawashi* (potato-tofu skewers with miso sauce)]

In this dish, chunks of *goshuimo* potato, konjac potato, and *iwadofu* (a firm type of bean curd native to this area) are placed on skewers, covered with miso (soybean) paste, and roasted around an open fireplace (Photo 60). This traditional dish especially utilizes the unique characteristics of *goshuimo* potatoes, which are sticky yet firm. The name *Dekomawashi* ("mawasu" means "to turn") is said to stem from the fact that the skewers being rotated as they are roasted around the fireplace resemble the movement of wooden Japanese theater puppets.

Photo 60. *Dekomawashi* (potato-tofu skewers with *miso* sauce)

[*Amego-no-hirara-yaki* (freshwater trout and vegetables in *miso* cooked on hot stone)]

Amego is a freshwater fish found in the clear rivers of the Nishi-Awa area and has been prized as a valuable source of protein since ancient times. Cooked outdoors, this dish involved heating a flat riverbed stone and then cooking various local ingredients on the stone. A ring of miso is first placed around the edge of the stone and the other ingredients are then placed inside this ring—potatoes and konjac potatoes picked from the sloping fields, *iwadofu* bean curd, and *amego* (freshwater trout)—and cooked together (Photo 61). This dish is believed to have originated when *Sangakubushi* (mountain warriors), who were active during the Northern and Southern Courts period (1336–1392), held a friendship dinner at the halfway point between their domains. Today, the dish is served at gatherings of family or friends as well as when entertaining guests.

Photo 61. *Amego-no-hirara-yaki* (freshwater trout and vegetables in *miso* cooked on hot stone)

iv) Water resource management by settlement communities

At 2,209 mm/year, the annual precipitation for the Nishi-Awa area is high, exceeding the national average (Higashi-Iya, Miyoshi City) [Japan Meteorology Agency 2010: Higashi-Iya, Miyoshi City], and the water management of sloping land settlements is supported by each community.

Photo 62. *Mizu-shikake* (Hisayabu Village)

In Tsurugi Town, 79 out of the 181 settlements [Tsurugi Town; 2016] have constructed a management system for water for agricultural use and household use that is indispensable for everyday life. Under this system, residents gather together after heavy rain or after the winter snow thaws to jointly carry out maintenance of drains—a task referred to as *mizu-shikake*—and this system of mutual aid within settlements has enabled these activities to be carious out continuously in addition to reducing costs (Photo 62).

Moreover, even in the highest sections of settlements where there are few mountain streams, spring water is utilized to the maximum using the water retention functions of watershed protection forest and crystalline schist soil in order to secure stable water resources.

(5) Landscape and seascape features

(a) History and features of the landscape

The greatest characteristic of the Nishi-Awa landscape is that housing, fields, grasslands, and forest are functionally distributed over sloping land in an integrated manner—an arrangement that appears inconvenient at first glance—rather than separating fields/paddies and grasslands from housing, as is the case in other areas. Compactly bringing together these various elements, Nishi-Awa's multiple-function settlements create a uniquely beautiful mosaic landscape.

Ever since the land was opened up through shifting (slash-and-burn) cultivation, the people of this area have used their knowledge obtained through their experience over many years to construct fields and housing in places where damage from disasters is minimized. Avoiding eroded gullies and choosing locations where damage from landslides is unlikely, even on slopes, the area's residents have maintained a landscape that is both disaster-resistant and sustainable.

(b) Elements and functions that configure the landscape

i) Drainage management and water resources management for preventing soil erosion

The reason that settlements were established in the Nishi-Awa area, despite the harsh conditions, and the landscape has been maintained is that it is easy to secure water here.

The crystalline schist zone of the Sambagawa Belt and Mikabo Belt in the Mt. Tsurugi area is one of Japan's main landslide zones. The area also has Japan's largest fault crushing zones running through it, making it easy to build fields and paddies, and as long as residents leave watershed protection forest at the top of the mountain, the area provides the geotechnical conditions necessary for a stable supply of spring water.

Consequently, as a piece of knowledge regarding securing a safe and stable water source, settlers in the area secured water resources by leaving watershed protection forest at the top of the mountain and surrounding sloping land settlements with forest. Even today, mountain spring water is drawn up from valleys and wellsprings to settlement houses and stored in man-made wells or ponds for use in agriculture, as well as for drinking water, cooking, washing, fire prevention, and fish-farming.

However, residents of the area are also constantly being forced to face damage from excessive rainfall and landslides.

Accordingly, measures have been implemented to preserve the soil using excellent drainage management techniques under the Nishi-Awa Steep Slope Agriculture System. The first of these is to build ridges along contours (both stripping and planting), thereby achieving a dam effect that prevents soil runoff due to rain (Photo 63). Furthermore, these ridges slow the flow of surface water, maximizing the water's penetration of agricultural land. This reduces soil erosion and purifies muddy water as well. The second measure is to cut construct stonework (Photo 64) across cultivation slopes at appropriate intervals along contours on the mountainside as well as longitudinal drainage channels (Photo 65) for discharging water from each field. This system guides excess water flow into the longitudinal drainage channels, carrying the water safely out of the cultivation area [Soshichiro Nakamura, 1957].

These structures (Figure 14) preserve the beautiful landscape of steep slope land settlements.

Photo 63. Ridges along contours prevent soil runoff

Photo 64. Stonework built along contours

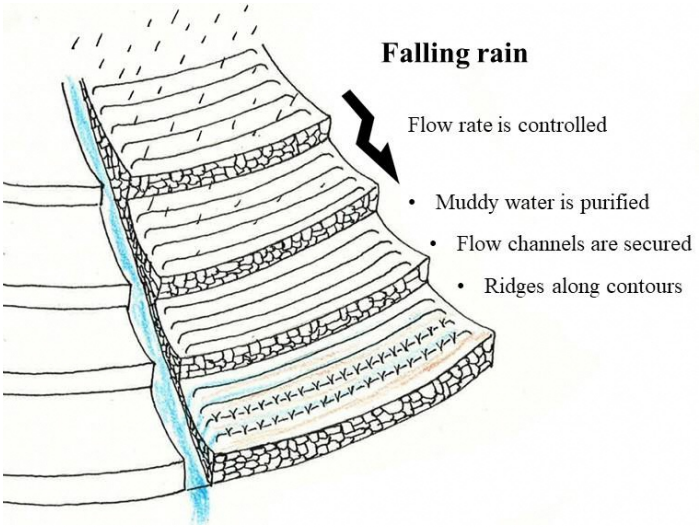


Figure 14. Image of drainage management using stonework

Photo 65. Longitudinal drainage channel

In the Nishi-Awa steep slope land settlements, cultivation land, farmhouses, and mountain forest are indivisible, and none are managed independently. In particular, leaving watershed protection forest on the top parts of mountain slopes, known as *hachigo-giri* (Photo 66), supplies water to lower parts of the mountain (cultivation land, grasslands, housing, *o-do*) as well as prevents damage from landslides, etc. due to heavy rain.

With their uniquely interweaving land usage, these sloping land settlements create a dynamic and deeply impressive landscape. Featuring a diversity of crops, *koeguro* stacks (Photo 67)—which can be said to be a symbol of sloping land agriculture, and produce drying on *hade* in the sun, this distinctive landscape comprises the elements of farm operation and is an important tourism resource for the area—as represented by Ochiai Village's (Photo 68) designation by the national government as an Important Preservation District for Groups of Traditional Buildings—and the government and private organizations are working together to maintain this landscape.

Photo 66. *Hachigo-giri* (Kubino Village, Mima City)

Photo 67. *Koeguro* stacks

Photo 68. Ochiai Village (Miyoshi City)

(Attachment 1-1)

Location Map of Steep Slope Land Agriculture System

- The purple area on the map indicates the location of farmland (including paddies) in the slope land villages.
- The total area of this farmland is 2,376 ha, of which 1,917 ha (80.6%) are fields on steep slopes inclined 15 degrees or more (2014 results of a survey of districts targeted for The System of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas).
- The 195 villages and 989 ha of steep slope fields marked on the map, having been designated areas in which to preserve the Nishi-Awa Steep Slope Agriculture System, will be the target of efforts focused on sustaining agricultural production activities and conserving farmland.

Agricultural land targeted for the third phase of The System of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas (㎡)

Name of city or town	Number of settlements	Rice fields on steep slopes	Rice fields on slopes	Fields on steep slopes	Fields on slopes	Total
Mima City	93	964,693	0	4,873,007	427,000	6,264,700
Miyoshi City	153	903,097	299,000	7,855,763	1,172,500	10,230,360
Tsurugi Town	70	198,800	55,900	4,276,400	71,200	4,602,300
Higashi-Miyoshi Town	31	188,799	40,910	2,167,895	265,846	2,663,450
Total	347	2,255,389	395,810	19,173,065	1,936,546	23,760,810

Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas (㎡)

Name of city or town	Number of settlements	Rice fields on steep slopes	Rice fields on slopes	Fields on steep slopes	Fields on slopes	Total
Mima City	53	421,804	0	2,801,796	110,311	3,333,911
Miyoshi City	61	343,653	174,308	2,417,894	259,596	3,195,451
Tsurugi Town	57	181,947	53,055	3,500,078	67,838	3,802,918
Higashi-Miyoshi Town	24	128,983	3,856	1,166,801	242,150	1,541,790
Total	195	1,076,387	231,219	9,886,569	679,895	11,874,070

List of settlement-organized agricultural land in two cities and two towns

2市2町集落協定締結農地一覧

Mima City: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○美馬市 3期中山間直接支払事業 集落協定締結地域 (㎡)

No.	協定集落名	田・急傾斜	田・緩斜面	畑・急斜面	畑・緩斜面
mm-1	横 倉	13,567		114,222	
mm-2	西大谷口	3,881		51,878	
mm-3	野田ノ井北	11,466		29,569	
mm-4	野田ノ井南	1,715		102,449	
mm-5	中 村			122,501	7,265
mm-6	吉 次	43,855		1,711	
mm-7	惣 後	7,678		15,488	
mm-8	仕出原	13,703		24,394	40,317
mm-9	森 後	6,525		118,366	
mm-10	中 熊	29,129		40,842	
mm-11	西大谷奥	7,915		95,769	
mm-12	本 穴	4,068		49,353	
mm-13	中 八			17,514	
mm-14	丈 斎	6,324		48,911	
mm-15	入善上	2,402		21,397	
mm-16	入 倉	11,614		1,094	3,562
mm-17	昭和1			53,025	
mm-18	昭和2			33,742	3,454
mm-19	大久保1			75,888	
mm-20	上久保	15,693		57,450	
mm-21	百貫山			31,191	4,193
mm-22	藤 宇	1,150		150,627	2,027
mm-23	鎌 政	13,378		62,831	14,589
mm-24	南 部	24,796		88,165	
mm-25	虎 山			97,160	
mm-26	六郎中野	2,255		47,789	
mm-27	浜名(1)-2	11,929		57,845	
mm-28	浜名中村	2,824		64,198	
mm-29	西 谷	3,116		48,470	
mm-30	西山(東)	622		26,761	
mm-31	中野宮	3,361		35,980	
mm-32	中 屋	6,061		617	3,422
mm-33	丸 山	8,948		34,528	
mm-34	鎌 銅	6,797		40,389	
mm-35	八 内	3,513		50,624	
mm-36	田 方	21,522		41,084	
mm-37	半 平			58,686	
mm-38	原 野			117,044	
mm-39	鍋子野	15,753		51,178	
mm-40	滝 原			85,300	
mm-41	市和ノ二戸			14,137	
mm-42	今 丸			15,415	
mm-43	南 境			37,703	
mm-44	久 久			77,530	
mm-45	種 木			87,362	
mm-46	内川竹			31,725	3,539
mm-47	八 幡	154		30,970	
mm-48	弓 道			30,385	
mm-49	谷 口			19,683	
mm-50	太 合			56,573	
mm-51	中尾山			3,392	25,137
mm-52	川 上			52,152	2,806
mm-53	東俣名	116,090		35,139	
合計		421,804	0	2,801,796	110,311

Miyoshi City: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○三好市 3期中山間直接支払事業 集落協定締結地域 (㎡)

No.	協定集落名	田・急傾斜	田・緩斜面	畑・急斜面	畑・緩斜面
my-1	蔵座			88,613	
my-2	中野々	20,678			94,649
my-3	東谷	3,567		80,095	
my-4	中西西			54,577	
my-5	東川原	13,102	143,669		
my-6	芝生上筋	49,041			12,380
my-7	勘場			29,888	
my-8	井ノ久保西	26,490			
my-9	境谷	18,691			336
my-10	峰ノ久保			15,445	36,740
my-11	馬路	39,439	25,004		3,156
my-12	野呂内	48,637	5,635		
my-13	安応	392		36,204	
my-14	只安	3,234		70,810	
my-15	太閤床			34,119	
my-16	馬場	7,909		58,483	110,277
my-17	黒川谷	7,237		87,981	
my-18	法善			33,107	
my-19	中屋			95,617	
my-20	大野	4,306		90,679	
my-21	川井			134,615	
my-22	大川持			40,647	
my-23	平			66,101	
my-24	上名影			85,999	
my-25	下川			62,773	
my-26	寺野			46,313	
my-27	西地	2,227		39,792	
my-28	中ノ瀬	2,236		14,111	
my-29	浜谷	4,820		48,606	
my-30	弁瀬			57,375	
my-31	中角			52,184	
my-32	池原			25,287	
my-33	中津・吉木・坊	12,783		29,377	
my-34	段地・安田			70,401	
my-35	三視尾	1,485		25,941	
my-36	上吹			48,545	
my-37	走出・大森			20,511	
my-38	中・新段・笹桜	1,796		31,105	
my-39	知行・笠倉	2,257		56,197	
my-40	下影	7,907		39,757	
my-41	野住	1,005		30,551	
my-42	西ノ浦	8,540		114,928	
my-43	尾越			19,884	
my-44	中村	13,505		5,502	
my-45	西井川	24,292		19,027	
my-46	久保	16,438		4,440	
my-47	久保東			19,027	2,058
my-48	久保西			21,882	
my-49	寺浦上			53,353	
my-50	寺浦下			70,394	
my-51	善根・中屋・西名			25,543	
my-52	段・土日浦			28,060	
my-53	徳善			32,935	
my-54	徳山			23,250	
my-55	伊ノ谷			11,723	
my-56	重実・冥地	338		67,556	
my-57	今久保・中尾			36,188	
my-58	川崎			15,665	
my-59	下久保	1,301		15,298	
my-60	下宮			20,838	
my-61	日浦			10,655	
合計		343,653	174,308	2,417,894	259,596

Tsurugi Town: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○つるぎ町 3期中山間直接支払事業 集落協定締結地域 (㎡)

No.	協定集落名	田・急傾斜	田・緩斜面	畑・急斜面	畑・緩斜面
tr-1	天野	25,082		2,924	10,852
tr-2	田井	15,659	22,590	3,000	12,901
tr-3	西久保	29,941		75,952	16,893
tr-4	東久保	63,735		15,075	21,679
tr-5	日浦	840		42,392	
tr-6	堀化	6,545		66,276	
tr-7	半島石			211,891	
tr-8	下竹			55,408	
tr-9	高瀬	5,544		134,974	
tr-10	日開野			69,703	
tr-11	長野			27,451	
tr-12	眼鏡			65,392	
tr-13	小谷			72,251	
tr-14	鷲城			65,040	
tr-15	上名東			102,279	
tr-16	坂根	2,806		27,652	
tr-17	土蔵			32,785	
tr-18	下尾原			53,058	
tr-19	引地			26,181	
tr-20	宮内・岡・白村	13,214		126,046	
tr-21	岡山			131,501	
tr-22	僧地			118,152	
tr-23	柴内			106,096	1,848
tr-24	神子・中山	470		122,349	504
tr-25	長木・広谷			85,325	812
tr-26	半野・胡麻平			85,383	
tr-27	東貴道上			146,929	
tr-28	東貴道下			119,554	
tr-29	川見・三木筋			84,028	
tr-30	宗重・宅敷・竹屋敷			94,649	
tr-31	長瀬			91,675	
tr-32	吉良・横野・木屋			157,810	
tr-33	宮中・日浦			57,504	
tr-34	猿飼			53,517	
tr-35	大切			27,354	
tr-36	中敷		20,538		
tr-37	小野	18,111	848	1,856	2,349
tr-38	松生		9,079		
tr-39	白石			30,160	
tr-40	下高来			11,699	
tr-41	佐古戸			21,626	
tr-42	一宇			36,310	
tr-43	赤松			145,630	
tr-44	木地屋・大枝・中槙			32,333	
tr-45	切畑・太刀之木			26,772	
tr-46	久保			65,145	
tr-47	五名上			48,682	
tr-48	伊良原			36,295	
tr-49	境			29,612	
tr-50	新宇			49,261	
tr-51	川又・実平・奥大野			33,081	
tr-52	広沢			20,622	
tr-53	一宇			26,154	
tr-54	明谷			38,456	
tr-55	三日浦			15,809	
tr-56	出羽			24,729	
tr-57	白井			23,090	
合計		181,947	53,055	3,500,078	67,838

Higashi-Miyoshi Town: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○東みよし町 3期中山間直接支払事業 集落協定締結地域 (㎡)

No.	協定集落名	田・急傾斜	田・緩斜面	畑・急斜面	畑・緩斜面
hg-1	内野			30,626	15,066
hg-2	畠			37,351	
hg-3	鳥籠	1,262		58,035	177
hg-4	男山	8,693		53,160	957
hg-5	原上	964		83,343	2,794
hg-6	原下	19,294		31,658	16,036
hg-7	石木			75,169	762
hg-8	増川	13,954	3,856	59,450	3,024
hg-9	柳沢			48,308	17,498
hg-10	次の丸			6,553	136,806
hg-11	西野	31,838		12,187	7,590
hg-12	滝下	28,796		9,991	3,927
hg-13	泉野	9,374		122,858	9,344
hg-14	五名上	964		48,498	2,762
hg-15	五名下			99,011	1,469
hg-16	寺			21,428	2,890
hg-17	長清			41,618	
hg-18	白内	359		45,720	7,390
hg-19	桑内	999		38,801	
hg-20	加茂山上			60,004	
hg-21	加茂山下	1,718		71,135	
hg-22	大藤			58,486	
hg-23	法市			54,029	7,371
hg-24	山田	11,712		382	4,787
合計		128,983	3,856	1,166,801	242,150

凡例

道路表

No.	一般国道	No.	一般国道
32	号	108	讃岡三好線
192	号	132	三加茂三好線
319	号	142	大利比線
438	号	149	池山京石線
439	号	161	阿波池田停車場線
◎	主要地方道	163	大歩危停車場線
4	丸亀三好線	261	菅生停車場線
5	観音寺池田線	262	芝生中生線
6	丸井観音寺線	264	出口大刀野線
8	観音寺仏野線	265	新山毛ノ内線
12	境町池田線	266	都屋線
32	山城東祖谷山線	267	白地州津線
44	三加茂東祖谷山線	268	特別内二箇停車場線
45	西祖谷山山城線	269	三縄停車場西沢線
		270	一宇坂口停車場線

河川表

No.	一級河川	No.	一級河川	No.	一級河川	No.	一級河川	No.	一級河川
1	吉野川	197	馬野谷川	214	津 川	231	谷 連 川	248	第一ゴウロ谷川
177	大藤谷川	198	子守谷川	215	北 谷 川	232	阿佐南谷川	249	第二ゴウロ谷川
179	瀬之谷川	199	馬木谷川	216	樋 谷 川	233	阿波谷川	250	天地谷川
180	中 鳥 川	200	井ノ内谷川	217	松 尾 川	234	中鬼谷川	251	田之内谷川
181	滝 谷 川	201	下野谷川	218	第一堀割川	235	鎖 谷 川	252	カイネヤ谷川
182	菅ヶ谷川	202	岩屋谷川	219	第三堀割川	236	貴ノ井谷川	253	新 山 川
186	山口谷川	203	金 山 谷 川	220	第二堀割川	237	松ノ木谷川	254	梅 川
187	山場谷川	204	中村谷川	221	ウツロ谷川	238	落合谷川	255	黒川谷川
188	河内谷川	205	小 川 谷 川	222	東土谷川	239	丸見谷川	256	柳川谷川
189	馬 立 川	206	増川谷川	223	奥 谷 川	240	なべら谷川	257	白川谷川
190	加茂谷川	207	滝久保谷川	224	白井谷川	241	第一西山谷川	258	弘子谷川
191	新発地谷川	208	西 谷 川	225	大宮谷川	242	第三西山谷川	259	藤川谷川
192	西 谷 川	209	里川谷川	226	鉄 谷 川	243	第二西山谷川	260	新屋谷川
193	伊井谷川	210	鮎 原 谷 川	227	鉄 原 谷 川	244	久保谷川	261	牛鹿谷川
194	京場谷川	211	弥十郎川	228	戸ノ内川	245	菅生谷川		

(Attachment 1-2)

Land Use Map of Steep Slope Land Agriculture System

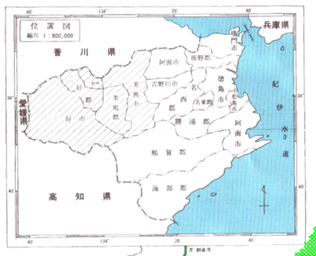
- This land use map was prepared using GIS software to display meshed (Shapefile) data on land use per 100 m2, available on the Ministry of Land, Infrastructure, Transport and Tourism's website (http://nlftp.mlit.go.jp/ksj/index.html), and colored to indicate paddy fields, farmland, forest, built-up areas, bodies of water, etc.
- The Tokushima-Mt. Tsurugi GIAHS Promotion Association has designated the area on the map enclosed by the black line as land on which to preserve the Nishi-Awa Steep Slope Land Agriculture System.
- Please view this map in conjunction with the Location Map of Steep Slope Land Agriculture System.

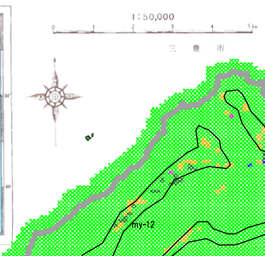
Agricultural land targeted for the third phase of The System of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas (㎡)

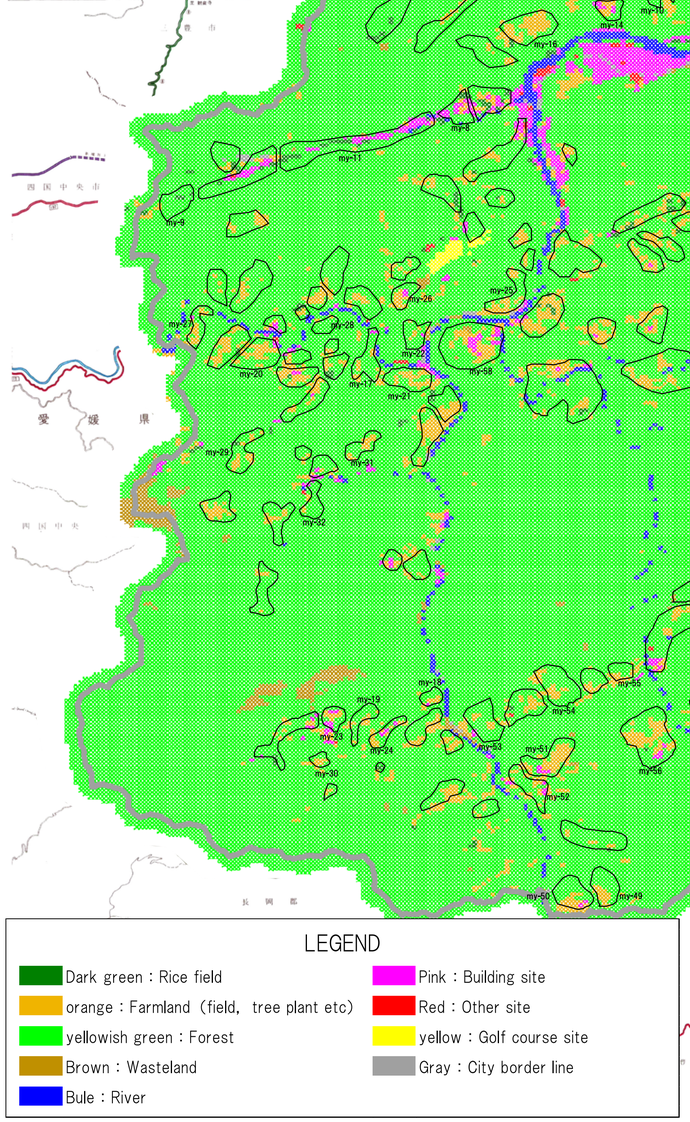
Name of city or town	Number of settlements	Rice fields on steep slopes	Rice fields on slopes	Fields on steep slopes	Fields on slopes	Total
Mima City	93	964,693	0	4,873,007	427,000	6,264,700
Miyoshi City	153	903,097	299,000	7,855,763	1,172,500	10,230,360
Tsurugi Town	70	198,800	55,900	4,276,400	71,200	4,602,300
Higashi-Miyoshi Town	31	188,799	40,910	2,167,895	265,846	2,663,450
Total	347	2,255,389	395,810	19,173,065	1,936,546	23,760,810

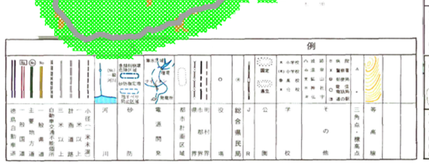
Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas (㎡)

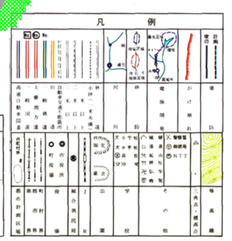
Name of city or town	Number of settlements	Rice fields on steep slopes	Rice fields on slopes	Fields on steep slopes	Fields on slopes	Total
Mima City	59	421,804	0	2,801,796	110,311	3,333,911
Miyoshi City	61	639,700	194,300	5,036,700	628,200	6,498,900
Tsurugi Town	57	181,947	53,055	3,500,078	67,838	3,802,918
Higashi-Miyoshi Town	24	128,983	3,856	1,166,801	242,150	1,541,790
Total	201	1,372,434	251,211	12,505,375	1,048,499	15,177,519











List of settlement-organized agricultural land in two cities and two towns

2市2町集落協定締結農地一覧

Mima City: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○美馬市　3期中山間直接支払事業　集落協定締結地域　(㎡)

No.	協定集落名	田・急傾斜田	田・緩斜面田	畑・急斜面畑	畑・緩斜面畑
mm-1	横　倉	13,567		114,222	
mm-2	西大谷口	3,881		51,878	
mm-3	野田ノ井元	11,466		29,569	
mm-4	野田ノ井南	1,715		102,449	
mm-5	中　村			122,501	7,265
mm-6	百　次	43,855		1,711	
mm-7	堂　後	7,678		15,488	
mm-8	仕出原	13,703		24,394	40,317
mm-9	森　迫	6,525		118,366	
mm-10	中　熊	29,129		40,842	
mm-11	西大谷奥	7,915		95,769	
mm-12	平　穴	4,068		49,353	
mm-13	中　八			17,514	
mm-14	天　宮	6,324		48,911	
mm-15	入倉上	2,402		21,397	
mm-16	入　倉	11,614		1,094	3,562
mm-17	昭和1			53,025	
mm-18	昭和2			33,742	3,454
mm-19	大久保1			75,888	
mm-20	上久保	15,693		57,450	
mm-21	立見山			31,191	4,193
mm-22	藤　平	1,150		150,827	2,027
mm-23	猿　坂	13,378		62,831	14,589
mm-24	南　部	24,796		88,165	
mm-25	尾　山			97,160	
mm-26	穴吹中野	2,255		47,789	
mm-27	浜名(1)~2	11,929		57,845	
mm-28	浜名中村	2,824		64,198	
mm-29	西　谷	3,116		48,470	
mm-30	西山(東)	622		26,761	
mm-31	中野笠	3,361		35,880	
mm-32	中　屋	6,061		617	3,422
mm-33	丸　山	8,948		34,528	
mm-34	猿　飼	6,797		40,389	
mm-35	大　内	3,513		93,624	
mm-36	田　万	21,522		41,084	
mm-37	半　平			58,686	
mm-38	百　野			117,044	
mm-39	猿子野	15,753		51,178	
mm-40	虎　原			85,300	
mm-41	市助・二戸			14,137	
mm-42	今　久			15,415	
mm-43	南　張			37,703	
mm-44	大　北			77,530	
mm-45	樋　木			87,362	
mm-46	内川竹			31,725	3,539
mm-47	八　幡	154		30,970	
mm-48	月　道			30,385	
mm-49	谷　口			19,683	
mm-50	太　良			56,573	
mm-51	東山口			3,392	25,137
mm-52	川　上			52,752	2,806
mm-53	東俣名	116,090		35,139	
合計		421,804	0	2,801,796	110,311

Miyoshi City: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○三好市　3期中山間直接支払事業　集落協定締結地域　(㎡)

No.	協定集落名	田・急傾斜田	田・緩斜面田	畑・急斜面畑	畑・緩斜面畑
my-1	漆　原	95,000		10,000	
my-2	田野々	31,000		130,000	5,000
my-3	東谷	10,500		128,000	10,000
my-4	中屋西	18,000		133,000	5,000
my-5	東川原		138,000		
my-6	芝生上筋	100,000	20,000	30,000	20,000
my-7	丹原	2,300	300	49,200	
my-8	井ノ久保西	29,700			
my-9	境谷	40,500			3,900
my-10	峰ノ久保			34,900	57,700
my-11	馬路	28,000	25,000		16,500
my-12	野呂内	66,000			
my-13	安広			70,700	
my-14	只安	3,200		70,600	31,100
my-15	大屋根	4,100		34,900	
my-16	クマバ	12,000		95,000	182,800
my-17	黒川谷	10,000	8,000	80,000	13,000
my-18	次角			40,000	11,000
my-19	津屋			97,000	10,000
my-20	大野	8,000	1,000	47,000	13,000
my-21	引末			140,000	38,000
my-22	大川持			50,000	14,000
my-23	平			100,000	10,000
my-24	上名影			130,000	10,000
my-25	下川			63,000	9,000
my-26	寺野			42,000	1,000
my-27	茂地	3,000		46,000	2,000
my-28	中ノ瀬	2,000		30,000	8,000
my-29	赤谷・平野	10,000	2,000	70,000	19,000
my-30	羽瀬			85,000	23,000
my-31	中有			40,000	11,000
my-32	光善			45,000	12,000
my-33	中津・吉木・切	14,100		81,600	
my-34	段地・安田	8,400		190,700	
my-35	三殿尾	1,000		70,800	
my-36	吹	2,800		98,300	
my-37	正夫・大森	2,100		174,400	
my-38	半・岩坂・冬桜	30,200		191,000	
my-39	知行・荒倉	11,900		179,100	
my-40	下影・駒倉	15,800		124,300	
my-41	野住	1,500		128,200	
my-42	西ノ浦	19,000		331,200	
my-43	尾越			51,800	
my-44	中村	41,600			32,200
my-45	西井川	47,000		52,300	
my-46	仕	22,000		16,000	
my-47	久保東			71,000	
my-48	久保西			29,000	
my-49	有瀬上	2,200		97,600	
my-50	有瀬下	600		135,500	
my-51	吾橋・中屋・西名			121,400	
my-52	堤・堤・日浦	700		54,600	
mm-53	徳善			51,300	
my-54	後山	600		66,000	
my-55	戸ノ谷	8,000		52,500	
my-56	重末・奥地	5,000		162,000	
my-57	今久保・中尾	5,000		95,500	
my-58	川崎			215,600	
my-59	下久保	19,900		187,400	
my-60	下谷			14,400	
my-61	釜川日浦	2,000		17,000	50,000
合計		639,700	194,300	5,036,700	628,200

Tsurugi Town: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○つるぎ町　3期中山間直接支払事業　集落協定締結地域　(㎡)

No.	協定集落名	田・急傾斜田	田・緩斜面田	畑・急斜面畑	畑・緩斜面畑
tr-1	大久	25,082		2,524	10,852
tr-2	田井	15,659	22,590	3,000	12,901
tr-3	西久保	29,941		75,952	16,893
tr-4	東久保	63,735		15,075	21,679
tr-5	日浦	840		42,392	
tr-6	鳥名	6,545		66,276	
tr-7	平良石			211,891	
tr-8	下竹			55,408	
tr-9	高須	5,544		134,974	
tr-10	日開野			69,703	
tr-11	長野			27,451	
tr-12	紙屋			65,392	
tr-13	小谷			72,251	
tr-14	葛城			65,040	
tr-15	上喜来			102,279	
tr-16	坂根	2,806		27,852	
tr-17	上須			32,785	
tr-18	下尾房			53,058	
tr-19	引地			26,181	
tr-20	宮内・岡・白村	13,214		126,046	
tr-21	浦山			131,501	
tr-22	僧地			118,152	
tr-23	泉内			106,096	1,848
tr-24	地子・中山	470		122,349	504
tr-25	長木・広谷			85,325	812
tr-26	平野・胴貫平			85,383	
tr-27	家貫道上			146,929	
tr-28	家貫道下			119,554	
tr-29	川見・三木坊			84,028	
tr-30	皆瀬・宅前・竹屋敷			94,649	
tr-31	長瀬			91,675	
tr-32	古良・横野・木屋			157,810	
tr-33	宮平・日浦			57,504	
tr-34	猿飼			53,517	
tr-35	大切			27,354	
tr-36	中鍛		20,538		
tr-37	小野	18,111	848	1,856	2,349
tr-38	松生		9,079		
tr-39	白石			30,160	
tr-40	下喜来			11,699	
tr-41	佐古戸			32,626	
tr-42	一宇			36,310	
tr-43	赤松			145,630	
tr-44	木地屋・大槻・中槻			32,333	
tr-45	切畑・大刀之本			28,772	
tr-46	久保			65,145	
tr-47	大野			63,082	
tr-48	伊良原			36,295	
tr-49	陰			29,612	
tr-50	剪宇			49,261	
tr-51	川又・東平・奥大野			33,081	
tr-52	広沢			20,622	
tr-53	平			26,154	
tr-54	明谷			38,456	
tr-55	逢目浦			15,809	
tr-56	出羽			24,729	
tr-57	白井			23,090	
合計		181,947	53,055	3,500,078	67,838

Higashi-Miyoshi Town: Settlement-organized region in the third phase of the project of Direct Payment of Subsidies to Farmers in Hilly and Mountainous Areas

○東みよし町　3期中山間直接支払事業　集落協定締結地域　(㎡)

No.	協定集落名	田・急傾斜田	田・緩斜面田	畑・急斜面畑	畑・緩斜面畑
hg-1	内野			30,628	19,066
hg-2	畑			37,351	
hg-3	葛籠	1,262		58,035	177
hg-4	男山	8,693		53,160	957
hg-5	岸上	984		83,343	2,794
hg-6	岸下	19,294		31,658	16,036
hg-7	石次			75,169	762
hg-8	増川	13,954	3,856	58,450	3,024
hg-9	柳沢			48,308	17,498
hg-10	次の丸			6,553	136,806
hg-11	西町	31,838		12,187	7,590
hg-12	滝下	28,796		9,991	3,927
hg-13	泉野	9,374		122,858	9,344
hg-14	五名上			48,498	4,262
hg-15	五名下			99,011	1,469
hg-16	平			21,428	2,890
hg-17	森清			41,618	
hg-18	白内	359		45,720	7,390
hg-19	桑内	999		38,801	
hg-20	加茂山上			60,004	
hg-21	加茂山下	1,718		71,135	
hg-22	大藤			58,486	
hg-23	法市			54,029	7,371
hg-24	山田	11,712		382	4,787
合計		128,983	3,856	1,166,801	242,150

(Attachment 2)

Biodiversity List

EX: Extinct; EW: Extinct in the wild; CR+EN: Critically endangered + Endangered; VU: Vulnerable; NT: Near Threated; DD: Data Deficient

Class	Family	Name	Scientific Name	Red Data Book	
				Japan	Tokushima
Plants	Menispermaceae	Queen coralbead	*Cocculus trilobus* (Thunb.) DC.		
	Amaranthaceae	Fat hen	*Chenopodium album* L. *var. centrorubrum* Makino		
	Rubiaceae	Indian madder	Rubia *argyi* (H.Lév. et Vaniot) H.Hara ex Lauener et D.K.Ferguson		
		Hashikagusa madder	Neanotis *hirsuta* (L.f.) W.H.Lewis		
		Hime-yotsuba-mugura madder	*Galium gracilens* (A.Gray) Makino		
		Skunkvine	*Paederia foetida* L.		
		Bedstraw	*Galium spurium* L. var. *echinospermon* (Wallr.) Desp.		
	Onagraceae	Redsepal evening primrose	*Oenothera glazioviana* Micheli		
		Chilean evening primrose	*Oenothera stricta* Ledeb. ex Link		
		Enchanter's nightshade	*Circaea mollis* Siebold et Zucc.		
		Common evening primrose	*Oenothera biennis* L.		
	Lardizabalaceae	Chocolate vine	*Akebia quinata* (Houtt.) Decne.		
		Threeleaf akebia	*Akebia trifoliata* (Thunb.) Koidz.		
	Hydrangeaceae	Deutzia	*Deutzia crenata* Siebold et Zucc.		
		Fuzzy pride-of-Rochester	*Deutzia scabra* Thunb.		
		Panicled hydrangea	*Hydrangea paniculata* Siebold		
		Japanese hydrangea vine	*Schizophragma hydrangeoides* Siebold et Zucc.		
		Mountain hydrangea	*Hydrangea serrata* (Thunb.) Ser.		
	Brassicaceae	Bog yellowcress	*Rorippa palustris* (L.) Besser		
		Shepherd's purse	*Capsella bursa-pastoris* (L.) Medik.		
		Hairy rockcress	*Arabis hirsuta* (L.) Scop.		
	Iridaceae	Leopard flower	*Iris domestica* (L.) Goldblatt et Mabb.		
		Annual blue-eyed grass	*Sisyrinchium rosulatum* E.P.Bicknell		
		Japanese iris	*Iris japonica* Thunb.		
	Juncaceae	*Nukaboshisou* rush	*Luzula plumosa* E.Mey.		
		Slender rush	*Juncus tenuis* Willd.		
		Wood rush	*Luzula capitata* (Miq.) Miq. ex Kom.		
		Lamp rush	*Juncus decipiens* (Buchenau) Nakai		
	Colchicaceae	Japanese fairy bells	*Disporum smilacinum* A.Gray		
		Fairy bells	*Disporum sessile* D.Don ex Schult. et Schult.f.		
	Poaceae	Japanese silver grass	*Eccoilopus cotulifer* (Thunb.) A.Camus		
		Japanese bristlegrass	*Setaria faberi* R.A.W.Herrm.		
		Japanese bluegrass	*Poa nipponica* Koidz.		
		Timothy grass	*Phleum pratense* L.		
		Indian goosegrass	*Eleusine indica* (L.) Gaertn.		
		Green bristlegrass	*Setaria viridis* (L.) P.Beauv.		
		Kanitsurigusa grass	*Trisetum bifidum* (Thunb.) Ohwi		
		Kamojigusa grass	*Elymus tsukushiensis* Honda var. *transiens* (Hack.) Osada		
		Kitsunegaya grass	*Bromus remotiflorus* (Steud.) Ohwi		
		Yellow foxtail	*Setaria pumila* (Poir.) Roem. et Schult.		
		Big quakinggrass	*Briza maxima* L.		
		Small carpetgrass	*Arthraxon hispidus* (Thunb.) Makino		
		Trailing crabgrass	*Digitaria radicosa* (J.Presl) Miq.		
		Aokamojigusa grass	*Elymus racemifer* (Steud.) Tzvelev		
		Chinese silvergrass	*Miscanthus sinensis* Andersson		
		Sasagaya grass	*Leptatherum japonicum* Franch. et Sav.		
		Toboshigara grass	*Festuca parvigluma* Steud.		
		Annual bluegrass	*Poa annua* L.		
		Southern crabgrass	*Digitaria ciliaris* (Retz.) Koeler		
		Cogongrass	*Imperata cylindrica* (L.) Raeusch.		
		Chinese fountaingrass	*Pennisetum alopecuroides* (L.) Spreng.		
		Wavyleaf basketgrass	*Oplismenus undulatifolius* (Ard.) Roem. et Schult.		
		Todashiba grass	*Arundinella hirta* (Thunb.) Tanaka		
		Rat's-tail grass	*Vulpia myuros* (L.) C.C.Gmel.		
		Sasagaya grass	*Agrostis clavata* Trin. var. *nukabo* Ohwi		
		Korean lawngrass	*Zoysia japonica* Steud.		
		Chee reedgrass	*Calamagrostis epigeios* (L.) Roth		

Plants	Pteridaceae	Spider brake	*Pteris multifida* Poir.		
	Urticaceae	Ramie	*Boehmeria nivea* (L.) Gaudich. var. *concolor* Makino f. *nipononivea* (Koidz.) Kitam. ex H.Ohba		
		Akaso falsenettle	*Boehmeria silvestrii* (Pamp.) W.T.Wang		
		Koakaso falsenettle	*Boehmeria spicata* (Thunb.) Thunb.		
		Japanese falsenettle	*Boehmeria japonica* (L.f.) Miq. var. *longispica* (Steud.) Yahara		
		Smooth tare	*Nanocnide japonica* Blume		
	Araliaceae	Ivy	*Hedera rhombea* (Miq.) Bean		
		Udo	*Aralia cordata* Thunb.		
	Cucurbitaceae	Japanese snake gourd	*Trichosanthes cucumeroides* (Ser.) Maxim. ex Franch. et Sav.		
		Five-leaf ginseng	*Gynostemma pentaphyllum* (Thunb.) Makino		
	Anacardiaceae	Asian poison ivy	*Toxicodendron orientale* Greene		
	Plantaginaceae	Chinese plantain	*Plantago asiatica* L.		
	Dryopteridaceae	Japanese painted fern	*Anisocampium niponicum* (Mett.) Y.C.Liu, W.L.Chiou et M.Kato		
		Japanese wood fern	*Dryopteris erythrosora* (D.C.Eaton) Kuntze		
		Japanese holly fern	*Cyrtomium fortunei* J.Sm.		
	Guttiferae	*Otogirisou* St. John's wort	*Hypericum erectum* Thunb.		
		Otogirisou St. John's wort	*Hypericum pseudopetiolatum* R.Keller		
		Great St. John's wort	***Hypericum ascyron* L.**		**VU**
	Valerianaceae	**Yellow patrinia**	***Patrinia scabiosifolia* Fisch. ex Trevir.**		**CR+EN**
	Alismataceae	Threeleaf arrowhead	*Sagittaria trifolia* L.		
	Ebenaceae	Chinese persimmon	*Diospyros kaki* Thunb.		
	Oxalidaceae	Yellow oxalis	*Oxalis corniculata* L.		
		Violet wood-sorrel	*Oxalis debilis* Kunth subsp. *corymbosa* (DC.) Lourteig		
	Lygodiaceae	Japanese climbing Fern	*Lygodium japonicum* (Thunb.) Sw.		
	Cyperaceae	White-green sedge	*Carex leucochlora* Bunge		
		Asian flatsedge	*Cyperus microiria* Steud.		
		Greater brown sedge	*Carex brunnea* Thunb.		
		Ricefield flatsedge	*Cyperus iria* L.		
		Shiny-spike sedge	*Carex tristachya* Thunb.		
		Thin-spiculate sedge	*Carex ischnostachya* Steud.		
		Small mucronate sedge	*Carex mollicula* Boott		
		Green water sedge	*Cyperus brevifolius* (Rottb.) Hassk. var. *leiolepis* (Franch. et Sav.) T.Koyama		
	Campanulaceae	Spotted bellflower	*Campanula punctata* Lam.		
		Chinese lobelia	*Lobelia chinensis* Lour.		
		Japanese lady bell	*Adenophora triphylla* (Thunb.) A.DC. var. *japonica* (Regel) H.Hara		
	Asteraceae	Flax-leaf fleabane	*Erigeron bonariensis* L.		
		Wild chrysanthemum	*Aster microcephalus* (Miq.) Franch. et Sav. var. *ovatus* (Franch. et Sav.) Soejima et Mot.Ito		
		Yoshino thistle	*Cirsium nipponicum* (Maxim.) Makino var. *yoshinoi* (Nakai) Kitam.		
		Goldenrod	*Solidago virgaurea* L. subsp. *asiatica* (Nakai ex H.Hara) Kitam. ex H.Hara		
		Indian lettuce	*Lactuca indica* L.		
		Creeping lettuce	*Ixeris stolonifera* A.Gray		
		Spoonleaf purple everlasting	*Gamochaeta purpurea* (L.) Cabrera		
		Gray everlasting	*Gamochaeta coarctata* (Willd.) Kerguélen		
		Oriental false hawksbeard	*Youngia japonica* (L.) DC.		
		Fischers ragwort	*Ligularia fischeri* (Ledeb.) Turcz.		
		Japanese dandelion	*Taraxacum japonicum* Koidz.		
		Ox-tongue	*Picris hieracioides* L. subsp. *japonica* (Thunb.) Krylov		
		Shirayamagiku aster	*Aster scaber* Thunb.		
		Shiroyomena aster	*Aster ageratoides* Turcz.		
		Canada goldenrod	*Solidago altissima* L.		
		Common dandelion	*Taraxacum officinale* Weber ex F.H.Wigg.		
		Beggar-ticks	*Bidens biternata* (Lour.) Merr. et Sherff		
		American burnweed	*Erechtites hieraciifolius* (L.) Raf. ex DC.		
		False daisy	*Eclipta thermalis* Bunge		
		Threelobe beggar-ticks	*Bidens tripartita* L.		
		Father-and-child plant	*Euchiton japonicus* (Thunb.) Anderb.		
		Pennsylvania everlasting	*Gamochaeta pensylvanica* (Willd.) Cabrera		
		Spreading sneezeweed	*Centipeda minima* (L.) A.Braun et Asch.		
		Japanese sweet coltsfoot	*Petasites japonicus* (Siebold et Zucc.) Maxim.		
		Toothede ixeridium	*Ixeridium dentatum* (Thunb.) Tzvelev		
		Japanese thistle	*Cirsium japonicum* Fisch. ex DC.		
		Common sow thistle	*Sonchus oleraceus* L.		
		Cottonweed	*Pseudognaphalium affine* (D.Don) Anderb.		
		Annual fleabane	*Erigeron annuus* (L.) Pers.		
		Curly plumeless thistle	Carduus crispus L. subsp. *agrestis* (A.Kern.) Vollm.		

Plants	*Asteraceae*	Boneset	*Eupatorium makinoi* T.Kawahara et Yahara		
		Redflower ragleaf	*Crassocephalum crepidioides* (Benth.) S.Moore		
		Sigesbeckia pubescens	*Sigesbeckia pubescens* (Makino) Makino		
		Japanese mugwort	*Artemisia indica* Willd. var. *maximowiczii* (Nakai) H.Hara		
		Aster yomena	*Aster yomena* (Kitam.) Honda		
		Hairy cat's ear	*Hypochaeris radicata* L.		
		Eastern annual saltmarsh aster	*Symphyotrichum subulatum* (Michx.) G.L.Nesom		
		Indian chrysanthemum	*Chrysanthemum indicum* L.		
	Asparagaceae	Solmon's seal	*Polygonatum odoratum* (Mill.) Druce		
		Dwarf lilyturf	*Ophiopogon japonicus* (Thunb.) Ker Gawl.		
		Japanese jacinth	*Barnardia japonica* (Thunb.) Schult. et Schult.f.		
		Dwarf Solomon's seal	*Polygonatum falcatum* A.Gray		
		Big blue lilyturf	*Liriope muscari* (Decne.) L.H.Bailey		
	Acanthaceae	Water willow	*Justicia procumbens* L.		
	Apocynaceae	Rough potato	*Metaplexis japonica* (Thunb.) Makino		
		Kokamomejiru dogbane	*Vincetoxicum floribundum* (Miq.) Franch. et Sav.		
		Asiatic jasmine	*Trachelospermum asiaticum* (Siebold et Zucc.) Nakai		
		Koikema dogbane	*Cynanchum wilfordii* (Maxim.) Hook.f.		
		***Funabarasou* dogbane**	***Vincetoxicum atratum* (Bunge) C.Morren et Decne.**	**VU**	
	Ranunculaceae	Japanese buttercup	*Ranunculus japonicus* Thunb.		
		Three-leaved clematis	*Clematis apiifolia* DC.		
		Kitsunenobotan buttercup	*Ranunculus silerifolius* H.Lév.		
		Greater celandine	*Chelidonium majus* L. subsp. *asiaticum* H.Hara		
		***Shikoku-fukujusou* adonis**	***Adonis shikokuensis* Nishikawa et Koji Ito**	**VU**	
		Sweet autumn virginsbower	*Clematis terniflora* DC.		
		Lesser meadow-rue	*Thalictrum minus* L. var. *hypoleucum* (Siebold et Zucc.) Miq.		
		Spurless columbine	*Semiaquilegia adoxoides* (DC.) Makino		
	Cannabaceae	Japanese hop	*Humulus scandens* (Lour.) Merr.		
		Korean mulberry	*Morus australis* Poir.		
	Papaveraceae	Incised fumewort	*Corydalis incisa* (Thunb.) Pers.		
		Plume poppy	*Macleaya cordata* (Willd.) R.Br.		
	Dennstaedtiaceae	Hayscented fern	*Dennstaedtia hirsuta* (Sw.) Mett.		
		Dotted beadfern	*Hypolepis punctata* (Thunb.) Mett. ex Kuhn		
		Brackenfern	*Pteridium aquilinum* (L.) Kuhn		
	Phrymaceae	Birdeye speedwell	*Veronica persica* Poir.		
		Wall speedwell	*Veronica arvensis* L.		
		Japanese mazus	*Mazus pumilus* (Burm.f.) Steenis		
		Purple foxglove	*Digitalis purpurea* L.		
	Primulaceae	Gooseneck yellow loosestrife	*Lysimachia clethroides* Duby		
		Japanese yellow loosestrife	*Lysimachia japonica* Thunb.		
		Japanese primrose	*Primula japonica* A.Gray		
	Molluginaceae	Green carpetweed	*Mollugo verticillata* L.		
	Araceae	Crowdipper	*Pinellia ternata* (Thunb.) Breitenb.		
		Green dragons	*Pinellia tripartita* (Blume) Schott		
		Sweet flag	*Acorus calamus* L.		
	Smilacaceae	Oxtail greenbrier	*Smilax riparia* A.DC.		
	Schisandraceae	Japanese star anise	*Illicium anisatum* L.		
	Blechnaceae	Japanese deer fern	*Blechnum niponicum* (Kunze) Makino		
	Lamiaceae	East Asian sage	*Salvia japonica* Thunb.		
		Self-heal	*Prunella vulgaris* L. subsp. *asiatica* (Nakai) H.Hara		
		Ground ivy	*Glechoma hederacea* L. subsp. *grandis* (A.Gray) H.Hara		
		Decumbent bugle	*Ajuga decumbens* Thunb.		
		Chinese clinopodium	*Clinopodium chinense* (Benth.) Kuntze subsp. *grandiflorum* (Maxim.) H.Hara		
		Skullcap	*Scutellaria indica* L.		
		Slender wild basil	*Clinopodium gracile* (Benth.) Kuntze		
		Yamatoubana basil	*Clinopodium multicaule* (Maxim.) Kuntze		
		Japanese isodon	*Isodon japonicus* (Burm.f.) H.Hara		
		Mountain isodon	*Isodon inflexus* (Thunb.) Kudô		
		Henbit deadnettle	*Lamium amplexicaule* L.		
	Davalliaceae	Squirrel's foot fern	*Davallia mariesii* T.Moore ex Baker		
	Melanthiaceae	Japanese hyacinth	*Helonias orientalis* (Thunb.) N.Tanaka		
	Caprifoliaceae	Japanese honeysuckle	*Lonicera japonica* Thunb.		
	Xanthorrhoeaceae	Daylily	*Hemerocallis fulva* L. var. *disticha* (Donn ex Ker Gawl.) M.Hotta		
		Tawny daylily	*Hemerocallis fulva* L. var. *kwanso* Regel		

Plants	Violaceae	Manchurian violet	*Viola mandshurica* W.Becker		
		Nagabatachitsubo violet	*Viola ovato-oblonga* (Miq.) Makino		
		Marubasu violet	*Viola keiskei* Miq.		
		Korean violet	*Viola grypoceras* A.Gray		
	Apiaceae	*Nochidome* pennywort	*Hydrocotyle maritima* Honda		
		Japanese hedge parsley	*Torilis japonica* (Houtt.) DC.		
		Cow parsley	*Anthriscus sylvestris* (L.) Hoffm.		
		Sentousou chamaele	*Chamaele decumbens* (Thunb.) Makino		
		Java waterdropwort	*Oenanthe javanica* (Blume) DC.		
		Japanese honeywort	*Cryptotaenia canadensis* (L.) DC. subsp. *japonica* (Hassk.) Hand.-Mazz.		
		Umanomitsuba sanicle	*Sanicula chinensis* Bunge		
	Osmundaceae	Asian royal fern	*Osmunda japonica* Thunb.		
	Chloranthaceae	*Futarishizuka* chloranthus	*Chloranthus serratus* (Thunb.) Roem. et Schult.		
	Polygonaceae	Japanese knotweed	*Fallopia japonica* (Houtt.) Ronse Decr.		
		Oriental lady's thumb	*Persicaria longiseta* (Bruijn) Kitag.		
		Hontokutade lady's thumb	Persicaria pubescens (Blume) H.Hara		
		Bitter dock	*Rumex obtusifolius* L.		
		Green sorrel	*Rumex acetosa* L.		
		Jumpseed	*Persicaria filiformis* (Thunb.) Nakai ex W.T.Lee		
		Mizosoba knotweed	*Persicaria thunbergii* (Siebold et Zucc.) H.Gross		
	Aspleniaceae	Tiger's tail fern	*Asplenium incisum* Thunb.		
		Maidenhair spleenwort	*Asplenium trichomanes* L.		
	Theaceae	Tea	*Camellia sinensis* (L.) Kuntze		
	Commelinaceae	Asiantic dayflower	*Commelina communis* L.		
		Bluejacket	*Tradescantia ohiensis* Raf.		
		East Asian pollia	*Pollia japonica* Thunb.		
	Euphorbiaceae	Asian copperleaf	*Acalypha australis* L.		
		Spotted spurge	*Chamaesyce maculata* (L.) Small		
		Leafflower	*Phyllanthus lepidocarpus* Siebold et Zucc.		
	Equisetaceae	Field horsetail	*Equisetum arvense* L.		
	Saururaceae	Chameleon	*Houttuynia cordata* Thunb.		
	Solanaceae	Chinese desert-thorn	*Lycium chinense* Mill.		
		Black nightshade	*Solanum nigrum* L.		
	Caryophyllaceae	Sweet William silence	*Silene armeria* L.		
		Fringed pink	*Dianthus superbus* L. var. *longicalycinus* (Maxim.) F.N.Williams		
		Japanese woodland catchfly	*Silene miqueliana* (Rohrb.) H.Ohashi et H.Nakai		
		Thymeleaf sandwort	*Arenaria serpyllifolia* L.		
		Mouse-ear chickweed	*Cerastium fontanum* Baumg. subsp. *vulgare* (Hartm.) Greuter et Burdet var. *angustifolium* (Franch.) H.Hara		
		Chickweed	*Stellaria media* (L.) Vill.		
		Water chickweed	*Stellaria aquatica* (L.) Scop.		
		Japanese pearlwort	*Sagina japonica* (Sw.) Ohwi		
	Celastraceae	Oriental bittersweet	*Celastrus orbiculatus* Thunb.		
		Winged spindle	*Euonymus alatus* (Thunb.) Siebold		
	Ulmaceae	Japanese zelkova	*Zelkova serrata* (Thunb.) Makino		
		Chinese elm	*Ulmus parvifolia* Jacq.		
		Chinese hackberry	*Celtis sinensis* Pers.		
	Ophioglossaceae	**Longstem adder's-tongue**	***Ophioglossum petiolatum* Hook.**		**CR+EN**
		Ternate grape fern	*Botrychium ternatum* (Thunb.) Sw.		
	Orobanchaceae	Ye gu	*Aeginetia indica* L.		
	Rosaceae	Anemone cinquefoil	*Potentilla anemonifolia* Lehm.		
		Wild raspberry	*Rubus hirsutus* Thunb.		
		Hairy agrimony	*Agrimonia pilosa* Ledeb. var. *japonica* (Miq.) Nakai		
		Asian herb bennet	*Geum japonicum* Thunb.		
		Memorial rose	*Rosa luciae* Rochebr. et Franch. ex Crèp.		
		Threeleaf blackberry	*Rubus parvifolius* L.		
		Multiflora rose	*Rosa multiflora* Thunb.		
		Japanese winterberry	*Rubus buergeri* Miq.		
		Mock strawberry	*Potentilla hebiichigo* Yonek. et H.Ohashi		
		Mountain cherry	*Cerasus jamasakura* (Siebold ex Koidz.) H.Ohba		
	Lycopodiaceae	Running clubmoss	*Lycopodium clavatum* L.		
		Hair moss	*Selaginella remotifolia* Spring		
	Amaryllidaceae	Longstamen chive	*Allium macrostemon* Bunge		
		Red spider lily	*Lycoris radiata* (L'Hér.) Herb.		
	Cupressaceae	Japanese cedar	*Cryptomeria japonica* (L.f.) D.Don		

Plants	Thelypteridaceae	Japanese beech fern	*Thelypteris decursivepinnata* (H.C.Hall) Ching		
		Hariganewarabi shield-fern	*Thelypteris japonica* (Baker) Ching		
		Mizoshida fern	*Stegnogramma pozoi* (Lag.) K.Iwats.		
		Hoshida fern	*Thelypteris acuminata* (Houtt.) C.V.Morton		
		Milkwort	*Polygala japonica* Houtt.		
	Santalaceae	*Kanabikisou* sandalwood	*Thesium chinense* Turcz.		
	Amaranthaceae	Japanese chaff flower	*Achyranthes fauriei* H.Lév. et Vaniot		
		Pig's knee	*Achyranthes bidentata* Blume var. *japonica* Miq.		
		Purple amaranth	*Amaranthus blitum* L.		
	Geraniaceae	Thunberg's geranium	*Geranium thunbergii* Siebold ex Lindl. et Paxton		
	Vitaceae	Porcelain berry	*Ampelopsis glandulosa* (Wall.) Momiy. var. *heterophylla* (Thunb.) Momiy.		
		Bushkiller	*Cayratia japonica* (Thunb.) Gagnep.		
	Fagaceae	Japanese chestnut	*Castanea crenata* Siebold et Zucc.		
		Bao li	*Quercus serrata* Murray		
		Sawtooth Oak	*Quercus acutissima* Carruth.		
	Dennstaedtiaceae	*Fumotoshida* fern	*Microlepia marginata* (Panzer) C.Chr.		
	Crassulaceae	*Komochimasonesogusa* stonecrop	*Sedum bulbiferum* Makino		
	Adiantaceae	**Silver cloak fern**	***Cheilanthes argentea* (S.G.Gmel.) Kunze**		**NT**
	Lindsaeaceae	Chinese creepingfern	*Odontosoria chinensis* (L.) J.Sm.		
	Pinaceae	Japanese red pine	*Pinus densiflora* Siebold et Zucc.		
	Fabaceae	Vetch	*Vicia sativa* L. subsp. *nigra* (L.) Ehrh.		
		Shrubby sophora	Sophora flavescens Aiton		
		Japanese arrowroot	*Pueraria lobata* (Willd.) Ohwi		
		Chinese milk-vetch	*Astragalus sinicus* L.		
		Komatsunagi indigo	*Indigofera pseudotinctoria* Matsum.		
		White clover	*Trifolium repens* L.		
		Hairy vetch	*Vicia hirsuta* (L.) Gray		
		Beggar's lice	*Hylodesmum podocarpum* (DC.) H.Ohashi & R.R.Mill subsp. *oxyphyllum* (DC.) H.Ohashi & R.R.Mill		
		Millettia	*Wisteria japonica* Siebold et Zucc.		
		Pilose lespedeza	*Lespedeza pilosa* (Thunb.) Siebold et Zucc.		
		Silk tree	*Albizia julibrissin* Durazz.		
		Red clover	*Trifolium pratense* L.		
		Wand lespedeza	***Lespedeza virgata* (Thunb.) DC.**		**CR+EN**
		Sericea lespedeza	*Lespedeza cuneata* (Dum.Cours.) G.Don		
		Japanese wisteria	*Wisteria floribunda* (Willd.) DC.		
		Potato bean	*Apios fortunei* Maxim.		
		Japanese clover	*Kummerowia striata* (Thunb.) Schindl.		
		Hog-peanut	*Amphicarpaea bracteata* (L.) Fernald subsp. *edgeworthii* (Benth.) H.Ohashi		
		Yabutsuru adzuki bean	*Vigna angularis* (Willd.) Ohwi et H.Ohashi var. *nipponensis* (Ohwi) Ohwi et H.Ohashi		
		Shiro-kapitan	*Wisteria brachybotrys* Siebold et Zucc.		
	Rutaceae	White Himalayan rue	*Boenninghausenia albiflora* (Hook.) Rchb. ex Meisn. var. *japonica* (Nakai ex Makino et Nemoto) Suzuki		
	Pontederiaceae	Heartshape false pickerelweed	*Monochoria vaginalis* (Burm.f.) C.Presl ex Kunth		
	Boraginaceae	Cucumber herb	*Trigonotis peduncularis* (Trevir.) F.B.Forbes et Hemsl.		
	Berberidaceae	Heavenly bamboo	*Nandina domestica* Thunb.		
	Oleaceae	Border privet	*Ligustrum obtusifolium* Siebold et Zucc.		
	Primulaceae	Marlberry	*Ardisia japonica* (Thunb.) Blume		
	Phytolaccaceae	American pokeweed	*Phytolacca americana* L.		
		Indian pokeweed	*Phytolacca acinosa* Roxb.		
	Dioscoreaceae	Chinese yam	*Dioscorea polystachya* Turcz.		
		Kaededokoro yam	*Dioscorea quinquelobata* Thunb.		
		Japanese yam	*Dioscorea japonica* Thunb.		
		Oni-dokoro yam	*Dioscorea tokoro* Makino		
	Saxifragaceae	*Chidakesashi* false goat's beard	*Astilbe microphylla* Knoll		
		Strawberry geranium	*Saxifraga stolonifera* Curtis		
	Liliaceae	Heartleaf lily	*Cardiocrinum cordatum* (Thunb.) Makino		
		Leichtlin's lily	*Lilium leichtlinii* Hook.f. f. *pseudotigrinum* (Carrière) H.Hara et Kitam.		
		Formosa lily	*Lilium formosanum* A.Wallace		
		Toad lily	*Tricyrtis affinis* Makino		
	Orchidaceae	**Thunberg's epipactis**	***Epipactis thunbergii* A.Gray**		**CR+EN**
		East Asian platanthera	***Platanthera japonica* (Thunb.) Lindl.**		**CR+EN**
		Chinese spiranthes	*Spiranthes sinensis* (Pers.) Ames var. *amoena* (M.Bieb.) H.Hara		
		Aleutian bog orchid	***Platanthera tipuloides* (L.f.) Lindl. subsp. *nipponica* (Makino) Murata**		**DD**
	Clethraceae	White alder	*Clethra barbinervis* Siebold et Zucc.		
	Gentianaceae	*Tsururindou* gentian	*Tripterospermum japonicum* (Siebold et Zucc.) Maxim.		

Mammalia	Cercopithecidae	Japanese macaque	*Macaca fuscata*		
	Canidae	Raccoon dog	*Nyctereutes procyonides*		
	Felidae	Domestic cat	*Felis catus*		
	Mustelidae	Species of mustela	*Mustela sp*		
	Viverridae	Masked palm civet	*Pagum a larvata*		
	Suidae	Wild boar	*Sus scrofa*		
	Cervidae	Sika deer, Japanese deer	*Cervus nippon*		
	Bovidae	Japanese serow	*Capricomis cripus*		
	Leporidae	Hare	*Lepis brachyurus*		
Aves	Accipitridae	Black kite	*Milvus migrant*		
		Eurasian sparrowhawk	***Accipiter nisusu***	**NT**	**NT**
	Columbidae	Oriental turtle dove	*Streptopeliaorientalis*		
	Apodidae	Fork-tailed swift	*Apus pacificus*		
	Picidae	Japanese green woodpecker	*Picus awokera awokera*		
		Japanese pygmy woodpecker	*Dendrocopos kizuki*		
	Hirundinidae	Barn swallow	*Hirundo rustica*		
	Motacillidae	Gray wagtail	*Motacilla cinerea*		
		White sagtail	*Motacilla alba*		
		Japanese wagtail	*Motacilla grandis*		
		Species of wagtail	*otacilla sp*		
	Pycnonotidae	Brown-eared bulbul	*Hypsipetes amaurotis*		
	Muscicapidae	Daurian redstart	*Phoenicurus auroreus*		
		Pale thrush	*Turdus pallidus*		
	Cettiidae	Japanese bush warbler	*Cettia diphone*		
	Muscicapidae	Narcissus flycatcher	*Ficedula narcissina*		
	Paridae	Varied tit	*Parus varius*		
		Species of tit	*Parus sp*		
		Great tit	*Pants major*		
	Zosteropidae	Japanese white-eye	*Zosterops japonicus*		
	Emberizidae	Meadow bunting	*Emberiza cioides*		
		Rustic bunting	*Emberiza rustica*		
	Fringillidae	Grey-capped greenfinch	*Carduelis sinica*		
		Japanese grosbeak	*Eophona personata*		
	Passeridae	Eurasian tree sparrow	*Passer montanus*		
	Corvidae	Eurasian jay	*Garrulus glandarius*		
		Carrion crow	*Corvus corone*		
		Large-billed crow	*Corvus macrorhynchos*		
Reptilla	Scincidae	Japanese five-lined skink	*Plestiodon japonicus*		
	Colubridae	Tiger keelback	*Rhabdophis tigrinus tigrinus*		
Amphibia	Bufonidae	Japanese common toad	*Bufo japonicus japonicus*		
	Rhacophoridae	*Kajika* frog	*Buergeria buergeri*		
Insects	Libellulidae	Wandering glider	*Pantala flavescens*		
	Anisolabididae	Hasamimushi earwig	*Anisolabis maritima longiforceps*		
	Tettigoniidae	Conehead bush cricket	*Conocephalus chinensis*		
		Onaga long-horned grasshopper	*Conocephalus exemptus*		
		Himegisu cricket	*Eobiana engelhardti subtropica*		
		Species of *yabukiri* bush cricket	*Tettigonia sp.*		
	Phaneropteridae	*Sesujitsuyumushi* katydid	*Ducetia japonica*		
		Ashigurotsuyumushi sickle-bearing bush cricket	*Phaneroptera nigroantennata*		
	Gryllidae	*Haraokame* cricket	*Loxoblemmus campestris*		
		Mitsukado cricket	*Loxoblemmus doenitzi*		
		Enma field cricket	*Teleogryllus emma*		
	Trigonidiidae	*Madarasuzu* cricket	*Pteronemobius nigrofasciatus*		
		Kiashihibari-modoki cricket	*Trigonidium japonicum*		
	Tetrigidae	*Harahishibatta* groundhopper	*Tetrix japonica*		
		Yasehishibatta groundhopper	*Tetrix macilenta*		
	Pyrgomorphidae	Oriental long-headed locust	*Atractomorpha lata*		
	Acrididae	*Kurumabatta* marbled grasshopper	*Gastrimargus marmoratus*		
		Hinabatta field grasshopper	*Glyptobothrus maritimus maritimus*		
		Inagomodoki false rice grasshopper	*Mecostethus parapleurus*		
		Naki inago Japanese chirpy locust	*Mongolotettix japonicas japonicas*		
		Hane nagafuki grasshopper	*Ognevia longipennis*		
		Tsuchi inago Japanese ground grasshopper	*Patanga japonica*		
	Mantidae	Species of *tenodera* mantis	*Tenodera sp.*		
	Blattellidae	*Kisuji-gokiburi* cockroach	*Symploce striata striata*		

Insects	Aphididae	*Azamioo-higenaga-aburamushi* thistle aphid	*Uroleucon giganteum*		
		Kouzorina-higenaga-aburamushi thistle aphid	*Uroleucon picridis*		
	Aphrophoridae	*Himeshiro-obiawafuki* froghopper	*Aphrophora oblique*		
		Hoshiawafuki spotted froghopper	*Aphrophora stictica*		
		Maruawafuki oval froghopper	*Lepyronia coleoptrata*		
		Himemonki-awafuki spilltebug	*Tabiphora rugosa*		
	Membracidae	Brown treehopper	*Machaerotypus sibiricus*		
	Cicadellidae	Tipped leafhopper	*Bothrogonia ferruginea*		
		Green leafhopper	*Cicadella viridis*		
		Maejiro-hiroyokobai white-margined leafhopper	*Handianus limbifer*		
		Maejiro-ooyokobai white-margined leafhopper	*Kolla atramentaria*		
		Momoguro-yokobai leafhopper	*Paralaevicephalus nigrifemoratus*		
		Kurosaji-yokobai leafhopper	*Planaphrodes nigricans*		
	Issidae	*Maruunka* globular planthopper	*Gergithus variabilis*		
	Tropiduchidae	*Tatesujigunbai-unka* planthopper	*Catullia vittata*		
		Hiratagunbai-unka planthopper	*Ossoides lineatus*		
	Tingidae	*Shikimigunbai l* ace bug	*Stephanitis svensoni*		
	Reduviidae	*Akasashigame* assassin bug	*Cydnocoris russatus*		
		Hososashigame assassin bug	*Pygolampis bidentata*		
		Kubiakasashigame assassin bug	*Reduvius humeralis*		
		Shimasashigame assassin bug	*Sphedanolestes impressicollis*		
	Pachygronthidae	*Higenaga-kamemushi* chinch bug	*Pachygrontha antennata*		
	Rhyparochromidae	*Kobane-hyoutan-nagakamemushi* seed bug	*Togo hemipterus*		
	Geocoridae	*Oomenaga-kamemushi* big-eyed bug	*Piocoris varius*		
	Malcidae	Small bean bug	*Chauliops fallax*		
	Alydidae	Rice earhead bug	*Leptocorisa acuta*		
	Rhopalinae	Carrot bug	*Rhopalus maculatus*		
		Kebukahimeheri-kamemushi bug	*Rhopalus sapporensis*		
	Coreidae	Winter cherry bug	*Acanthocoris sordidus*		
		Hosohari-kamemushi bug	*Cletus punctiger*		
		Hari-kamemushi bug	*Cletus schmidti*		
		Harabiroheri-kamemushi broad bug	*Homoeocerus dilatatus*		
		Unipunctate broad bug	*Homoeocerus unipunctatus*		
		Ootsumakiheri-kamemushi bug	*Hygia lativentris*		
	Plataspidae	Globular stink bug	*Megacopta punctatissima*		
	Scutelleridae	Brownish stink-bug	*Eurygaster testudinaria sinica*		
	Pentatomidae	Brown marmorated stink bug	*Halyomorpha halys*		
		Small cabbage bug	*Eurydema dominulus*		
		Murasakishirahoshi-kamemushi shield bug	*Eysarcoris annamita*		
		Ebiiro-kamemushi stink bug	*Gonopsis affinis*		
		Red-striped stink-bug	*Graphosoma rubrolineatum*		
		Violaceous stink-bug	*Menida violacea*		
		Brown-winged green bug	*Plautia stali*		
		Tama-kamemushi stink bug	*Sepontia aenea*		
	Chrysopidae	*Yamato-kusakagerou* green lacewing	*Chrysoperla nipponensis*		
	Ichneumonidae	*Shirosuji-himebachi* wasp	*Achaius oratorius albizonellus*		
	Scoliidae	*Kiobitsuchi-bachi* scoliid wasp	*Scolia oculata*		
	Formicidae	*Hosoume-matsuooari* Japanese carpenter ant	*Camponotus bishamon*		
		Japanese carpenter ant	*Camponotus japonicas*		
		Muneakaōari ant	*Camponotus obscuripes*		
		Teranishishiriageari ant	*Crematogaster teranishiii*		
		Hayashi-kuroyama-ari ant	*Formica hayashi*		
		Kuroyama-ari ant	*Formica japonica*		
		Hayashikeari ant	*Lasius hayashi*		
		Ameiro-ari ant	*Nylanderia flavipes*		
		Amimeari ant	*Pristomyrmex punctatus*		
	Pompilidae	*Oomonkuro kumobachi* solitary wasp	*Anoplius samariensis*		
		Species of aporus wasp	*Aporus sp.*		
	Vespidae	*Kiboshiashinaga-bachi* wasp	*Polistes nipponensis*		
	Halictidae	*Akagane-kohanabachi* sweat bee	*Halictus aerarius*		
		Nippon-chibikohana-bachi sweat bee	*Lasioglossum japonicum*		
		Species of *kohanabachi* sweat bee	*Lasioglossum sp.*		

Insects	Apidae	Japanese honey bee	*Apis cerana japonica*		
		Long-tongued bumblebee	*Bombus diversus diversus*		
		Miyamamaru-hanabachi bee	*Bombus honshuensis honshuensis*		
		Japanese ceratina bee	*Ceratina japonica*		
		Japanese carpenter bee	*Xylocopa appendiculata circumvolans*		
	Carabidae	Tiger beetle	*Cicindela japana*		
		Atoboshiaogomi-mushi beetle	*Chlaenius naeviger*		
		Atowaaogomi-mushi beetle	*Chlaenius virgulifer*		
		Rurihiratagomi-mushi beetle	*Dicranoncus femoralis*		
		Akaashimarugatagomoku-mushi beetle	*Harpalus tinctulus*		
	Staphylinidae	*Akababababiro-oohanekakushi* beetle	*Agelosus carinatus carinatus*		
		Nakaakahigebuto-hanekakushi beetle	*Aleochara curtula*		
		Kuroganetogari-oozuhanekakushi beetle	*Platydracus inornatus*		
		Karakanetogari-oozuhanekakushi beetle	*Platydracus sharpi*		
	Ochodaeidae	*Akamadarasenchi-kogane* beetle	*Ochodaeus maculatus maculatus*		
	Scarabaeidae	*Himeashinaga-kogane* scarab beetle	*Ectinohoplia obducta*		
		Citrus flower chafer	*Gametis jucunda*		
		Velvety chafe	*Maladera castanea*		
		Japanese velvety chafer	*Maladera japonica*		
		Kobumaruenma-kogane scarab beetle	*Onthophagus atripennis*		
		Futokadoenma-kogane scarab beetle	*Onthophagus fodiens*		
		Japanese beetle	*Popillia japonica*		
	Ptilodactylidae	*Edahigenagahananomi* toe-winged beetle	*Epilichas flabellatus flabellatus*		
	Buprestidae	Flat-headed zelkova borer	*Agrilus cyaneoniger*		
		Cherry leaf-miner beetle	*Trachys tsushimae*		
	Elateridae	*Sabikikori* click beetle	*Agrypnus binodulus binodulus*		
		Nihon-benikometsuki click beetle	*Denticollis nipponensis nipponensis*		
		Aka-ashiookushi-kometsuki click beetle	*Melanotus cete*		
	Lycidae	Net-winged beetle	*Lycostomus modestus*		
		Hosobenibotaru net-winged beetle	*Mesolycus atrorufus*		
	Cantharidae	Species of *ninfujoukai* soldier beetle	*Asiopodabrus sp.*		
		Kubi-bosojoukai soldier beetle	*Hatchiana sp.*		
		Nishijoukaibon soldier beetle	*Lycocerus luteipennis luteipennis*		
		Black-spotted cantharid	*Lycocerus vitellinus*		
		Marumune-joukai soldier beetle	*Prothemus ciusianus*		
	Lampyridae	*Katamonminami-botaru* firefly	*Drilaster axillaris*		
		Obabotaru non-luminous diurnal firefly	*Lucidina biplagiata*		
		Oomado-botaru firefly	*Lychnuris discicollis*		
	Nitidulidae	Black flower beetle	*Carpophilus chalybeus*		
	Erotylidae	*Tsumagurohimekometsu-kimodoki* fungus beetle	*Anadastus praeustus*		
		Ruisukometsuki-modoki fungus beetle	*Languriomorpha lewisi*		
	Coccinellidae	*Mūashirohoshi-tentou* ladybug	*Calvia muiri*		
		Futamonkuro-tentou ladybug	*Cryptogonus orbiculus*		
		Seven-spot ladybird	*Coccinella septempunctata*		
		Harlequin ladybird	*Harmonia axyridis*		
		Turtle vein ladybug	*Propylea japonica*		
		Kokurohime-tentou ladybug	*Scymnus posticalis*		
		Nagahime-tentou ladybug	*Scymnus ruficeps*		
	Lathridiidae	*Usuchakeshi-makimush* scavenger beetle	*Cortinicara gibbosa*		
	Phalacridae	*Kurozumaru-himehanamushi* beetle	*Phalacrus punctatus*		
	Tenebrionidae	*Kuriirokuchiki-mushi* beetle	*Borboresthes acicularis*		
		False leaf beetle	*Lagria rufipennis*		
	Mordellidae	Species of *nisehime-hananomi* beetle	*Falsomordellistena sp.*		
		Kurohime-hananomi beetle	*Mordellistena comes*		
	Scraptiidae	*Kiirofunagata-hananomi* beetle	*Anaspis luteola*		
		Mitchifunagata-hananomi beetle	*Anaspis mitchii*		
	Oedemeridae	*Momobuto-kamikirimodoki* beetle	*Oedemera lucidicollis lucidicollis*		
	Anthicidae	*Hosokubiari-modoki* beetle	*Formicomus braminu*		
	Cerambycidae	Slender green longicorn beetle	*Chloridolum viride*		
		Apple black-margined longicorn beetle	*Nupserha marginella*		
		Ramie longicorn beetle	*Paraglenea fortune*		
		Red bamboo longicorn beetle	*Purpuricenus temminckii*		

Insects	Chrysomelidae	*Akaganesaru-hamushi* leaf beetle	*Acrothinium gaschkevitchii gaschkevitchii*		
		Azamikaminari-hamushi leaf beetle	*Altica cirsicola*		
		Samehadatsubunomi-hamushi spurge flea beetle	*Aphthona strigosa*		
		Ookiiromarunomi-hamushi leaf beetle	*Argopus balyi*		
		Munagurotsuya-hamushi leaf beetle	*Arthrotus niger*		
		Pellucid tortoise beetle	*Aspidimorpha transparipennis*		
		False melon beetle	*Atrachya menetriesi*		
		Cucurbit leaf beetle	*Aulacophora indica*		
		Black cucurbit leaf beetle	*Aulacophora nigripennis*		
		Golden-green minute leaf beetle	*Basilepta fulvipes*		
		Oorurihime-hamushi leaf beetle	*Calomicrus nobyi*		
		Smaller tortoise beetle	*Cassida fuscorufa*		
		Mugwort leaf beetle	*Chrysolina aurichalcea*		
		Yotsuboshinagatsutsu-hamushi leaf beetle	*Clytra arida*		
		Sweetpotato leaf beetle	*Colasposoma dauricum*		
		Rose leaf beetle	*Cryptocephalus approximates*		
		Tatesujikitsutsu-hamushi leaf beetle	*Cryptocephalus nigrofasciatus*		
		Black-spotted leaf beetles	*Cryptocephalus signaticeps*		
		Fuji-hamushi leaf beetle	*Gonioctena rubripennis*		
		Kurotoge-hamushi leaf beetle	*Hispellinus moerens*		
		Kiobikubiboso-hamushi leaf beetle	*Lema delicatula*		
		Dioscorea leaf beetle	*Lema honorata*		
		Mulberry flea beetle	*Luperomorpha funesta*		
		Soybean flea beetle	*Luperomorpha tenebrosa*		
		Rape leaf beetle	*Monolepta dichroa*		
		Yellow mulberry leaf beetle	*Monolepta pallidula*		
		Aeneous small leaf beetle	*Nodina chalcosoma*		
		Cupreous leaf beetle	*Oomorphoides cupreatus*		
		Aogurotsuya-hamushi leaf beetle	*Oomorphoides nigrocaeruleus*		
		Himetsuya-hamushi leaf beetle	*Oomorphus japanus*		
		Hagitsutsu-hamushi leaf beetle	*Pachybrachis eruditus*		
		Striped flea beetle	*Phyllotreta striolata*		
		Cabbage flea beetle	*Psylliodes punctifrons*		
		Viburnum leaf beetle	*Pyrrhalta humeralis*		
		Kiirotamanomi-hamushi leaf beetle	*Sphaeroderma unicolor*		
		Higenagausuba-hamushi leaf beetle	*Stenoluperus nipponensis*		
		Yellow-belly small leaf beetle	*Taphinellina flaviventre*		
		Higenaga-arahadatobi-hamushi leaf beetle	*Trachyaphthona sordida*		
	Anthribidae	*Usugurochibi-higenagazou-mushi* fungus weevil	*Uucifer truncates*		
	Attelabidae	Smaller black leaf-cut weevil	*Apoderus erythrogaster*		
		Poplar leaf-roller weevil	*Byctiscus puberulus*		
		Kashiruriotoshibumi weevil	*Euops splendidus*		
	Curculionidae	*Daikonsaruzou-mushi* weevil	*Ceuthorhynchidius albosuturalis*		
		Paulownia leaf weevil	*Cionus helleri*		
		Ooshiromonsaru-zoumushi weevil	*Hadroplontus ancora*		
		Species of *homorosoma* weevil	*Homorosoma sp.*		
		White-fumated burdock weevil	*Larinus griseopilosus*		
		Oblique-striped elongate weevil	*Lixus acutipennis*		
		Chestnut-leaved oak broad-mouth weevil	*Nothomyllocerus griseus*		
		Togeashihigeboso-zoumushi weevil	*Phyllobius annectens*		
		Oak jumping weevil	*Rhynchaenus japonicas*		
	Rhynchophoridae	Japanese giant weevil	*Sipalinus gigas*		
	Hesperiidae	Ocracea skipper butterfly	*Ochlodes ochraceus*		
	Papilionidae	Asian swallowtail butterfly	*Papilio xuthus*		
	Pieridae	Striated white butterfly	*Atrogeia melete*		
		Common white butterfly	*Atrogeia rapae crucivora*		
		Oriental clouded yellow butterfly	*Colidas erate poliographus*		
		Common grass yellow butterfly	*Eurema mandarina mandarina*		
	Lycaenidae	Long-tailed blue butterfly	*Lampides boeticus*		
		Small copper butterfly	*Lycaena phlaeas daimio*		
		Pale grass blue butterfly	*Zizeeria maha argia*		

Insects	Nymphalidae	Common map butterfly	*Cyrestis thyodamas mabella*		
		High brown fritillary butterfly	*Fabriciana adippe pallescens*		
		European beak butterfly	*Libythea lepita celtoides*		
		Lillacine bushbrown butterfly	*Mycalesis francisca perdiccas*		
		Chinese bushbrown butterfly	*Mycalesis gotama fulginia*		
		Common five-ring butterfly	*Ypthima argus*		
	Roeslerstammiidae	Copper ermel moth	*Roeslerstammia erxlebella*		
	Zygaenidae	*Yahoshihosomadara* smoky moth	*Balataea octomaculata*		
	Pyralidae	Bush clover pyralid moth	*Endotricha icelusalis*		
	Geometridae	*Uramon-akaedashaku* geometer moth	*Parepione grata*		
		Sub-angled wave moth	*Scopula nigropunctata imbella*		
	Sphingidae	Crisp-banded hawkmoth	*Neogurelca himachala sangaica*		
	Arctiidae	*Hagatakikokega* moth	*Miltochrista calamine*		
	Ctenuchidae	*Kihadakanoko* moth	*Amata germana germana*		
	Noctuidae	Ramie moth	*Arcte coerula*		
		Species of *tsumakiriyotou* moth	*Callopistria sp.*		
		Usuguroatsuba moth	*Traudinges fumosa*		
	Panorpidae	Japanese scorpionfly	*Panorpa japonica*		
	Tipulidae	Species of *hosogaganbo* fly	*Nephrotoma sp.*		
	Pleciidae	*Himeseakakebae* fly	*Penthetria japonica*		
	Stratiomyidae	*Harakinmizuabu* soldier fly	*Microchrysa flaviventris*		
	Tabanidae	Species of horse-fly	*Tabanus sp.*		
	Asilidae	*Ooishiabu* robber fly	*Laphria mitsukurii*		
		Magarikemushihiki robber fly	*Neoitamus angusticornis*		
		Hisamatsumushihiki robber fly	*Tolmerus hisamatsui*		
	Syrphidae	*Tsumagurokoshibosohanaabu* hoverfly	*Allobaccha apicalis*		
		Marmalade hoverfly	*Episyrphus balteatus*		
		Drone fly	*Eristalis tenax*		
		Species of *tsuyahirataabu* hoverfly	*Melanostoma sp.1*		
		Species of *oohanaabu* hoverfly	*Phytomia zonata*		
		Species of *minamihimehirataabu* hoverfly	*Sphaerophoria indiana*		

(Attachment 3)

Steep Slope Land Agricultural Diversity List

	English Name	Scientific Name
Fruits	Sweet Watson pomelo	Citrus natsudaidai Hayata
	Fig	Ficus carica L.
	Strawberry	Fragaria x ananassa Duchesne ex Rozier
	Unripe Japanese apricot	Prunus mume Siebold et Zucc.
	Small Japanese apricot	Prunus mume (Siebold) Siebold et Zucc. Var. microcarpa Makino
	Atago persimmon	Diospyros kaki Thunb.
	Yamato persimmon	Diospyros kaki Thunb.var.sylvestris Makino
	Saijo persimmon	Diospyros kaki Thunb.
	Tonewase persimmon	Diospyros kaki 'Tonewase'
	Jiro persimmon	Diospyros kaki 'Jiro'
	Fuyu persimmon	Diospyros kaki 'Fuyu'
	Chinese quince	Pseudo cydonia sinensis (Thouin) C.K.Schneid.
	Kumquat	Citrus japonica Thunb.
	Kiwifruit	Actinidia chinensis Planch. Var. deliciosa (A.Cheval.) A.Cheval.
	Ginkgo seed	Ginkgo biloba L.
	Golden kiwifruit	Actinidia chinensis Planch.
	Japanese chestnut	Castanea crenata Siebold et Zucc.
	Sudachi citrus	Citrus sudachi Hort. ex Shirai
	Hassaku orange	Citrus hassaku Hort. ex Tanaka,nom. nud.
	Blueberry	Vaccinium corymbosum.
	Yuzu citrus	Citrus junos (Makino) Siebold ex Tanaka
Vegetables	Asparagus	Asparagus officinalis L.
	Japanese knotweed	Fallopia japonica (Houtt.) Ronse Decr. Var. japonica
	Japanese spikenard	Aralia cordata Thunb.
	Okra	Abelmoschus esculentus (L.) Moench
	Turnip	Brassica rapa L.var.rapa
	Red turnip	Brassica rapa L.var.rapa
	Brown mustard	Brassica juncea (L.) Czern.
	Cabbage	Brassica oleracea L. var. capitata L.
	Cucumber	Cucumis sativus L.
	Watercress	Nasturtium officinale R.Br.
	Komatsuna	Brassica rapa L. var. perviridis L.H.Bailey
	Burdock	Arctium lappa L.
	Ostrich fern	Matteuccia struthiopteris(L.) Tod.
	Shantung vegetables	Brassica campestris L. var. amplexicaulis (Tanaka et Ono) Makino
	Red-leaf lettuce	Lactuca sativa L. var. capitata L.
	Green perilla	Perilla frutescens (L.) Britton var. crispa (Benth.) W.Deane f. viridis (Makino) Makino
	Red perilla	Perilla frutescens (L.) Britton var. crispa (Benth.) W.Deane f. purpurea (Makino) Makino
	Glebionis coronaria	Xanthophthalmum cornarium (L.) P.D.Sell
	Shishitou pepper	Capsicum annuum var. anglosum
	Zucchini	Cucurbita pepo L. 'Melopepo'
	Asian royal fern	Osmunda japonica Thunb.
	Senha wakegi onion	Allium x wakegi Araki
	Water dropwort	Oenanthe javanica (Blume) DC.
	Celery	Apium graveolens L. var. dulce (Mill.) Pers.
	Onion	Allium cepa L.
	Red onion	Allium cepa L.
	Leaf mustard	Brassica juncea (L.) Czern. Var. integrifolia (West.) Sinsk.
	Japanese radish	Raphanus sativus L. var. hortensis Backer
	Radish	Raphanus sativus L. var. sativus
	Lettuce	Lactuca sativa L.
	Bok choy	Brassica rapa L. var. chinensis(L.) Kitam.
	Winter melon	Benincasa hispida (Thunb.) Cogn.
	Cherry tomato	Solanum lycopersicum L. var. cerasiforme (Dunal) Fosberg
	Fruit tomato	Solanum lycopersicum L. var. cerasiforme (Dunal) Fosberg
	Tomato (*momotaro*)	Lycopersicon esculentum Mill.
	Red pepper	Capsium annuum L.
	Eggplant	Solanum melongena L.
	Senryou eggplant	Solanum melongena L.
	Long eggplant	Solanum melongena L.
	Rape blossoms	Brassica rapa L. var. oleifera DC.

Vegetables	Bitter gourd	Momordica charantia L.
	Carrot	Daucus carota L. subsp. Sativus (Hoffm.) Arcang.
	Kintoki carrot	Daucus carota L.
	Garlic chive	Allium tuberosum Rottler ex Spreng.
	Garlic	Allium sativum L.
	Green onion, leek	Allium fistulosum L.
	Japanese leek	Allium fistulosum L.
	Chayote	Sechium edule (Jacq.) Sw.
	Chinese cabbage	Brassica rapa L. var. glabra Regel 'Pe-tsai'
	Bell pepper	Capsicum annuum L.
	Parsley	Petroselinum crispum (Mill.) Fuss
	Herb	[Not specified]
	Green pepper	Capsicum annum L. Grossum group
	Butterbur sprout	Petasites japonicus (Siebold et Zucc.)
	Butterbur	Petasites japonicus (Siebold et Zucc.) Maxim
	Spinach	Spinacia oleracea L.
	Korean melon	Cucumis melo L. var. makuwa Makino
	Myoga	Zingiber mioga (Thunb.) Roscoe
	Mizuna	Brassica rapa L. var. nipposinica (L.H.Bailey) Kitam.
	Japanese honewort	Cryptotaenia canadensis (L.) DC. Subsp. Japonica (Hassk.) Hand.-Mazz.
	Mulukhiyah	Corchorus olitorius L.
	Bottle gourd	Lagenaria siceraria var.clavata
	Japanese mugwort	Artemisia indica Willd. Var. maximowiczii (Nakai) H.Hara
	Chinese onion	Allium chinense G.Don
	Lettuce	Lactuca sativa L.var.capitata L.
	Eastern brakenfern	Pteridium aquillium (L.) Kuhn subsp. Japonicum (Nakai) A. et D.Love
	Wakegi onion	Allium x wakegi Araki
Crops	Amaranthus	[Not specified]
	Sorghum, great millet	Sorghum bicolor (L.) Moench
	Foxtail millet	Setaria italica (L.) P.Beauv.
	Japanese barnyard millet	Echinochloa escukenta (A.Braun) H.Scholz
	Finger millet	Eleusine coracana (L.) Gaertn.
	Little millet	Panicum sumatrense Roth ex Roem. Et Schult
	Large broad bean	Vicia faba L.
	Common bean	Phaseolus vulgaris L.
	Mange tout, snow pea	Pisum sativum L. var.macrocarpum Ser.
	Green pea	Pisum sativum L.
	Red mung bean, *adzuki* bean	Vigna angularis (Willd.) Ohwi et H.Ohashi var. angularis
	Black soybean	Glycine max (L.) Merr.subsp.max
	Soybean	Glycine max (L.) Merr.subsp.max
	Red kidney bean	Phaseolus vulgaris L.
	Kijira soybean	Glycine max (L.) Merr.subsp.max
	Pinto bean	Phaseolus vulgaris L.
	Green bean	Phaseolus vulgaris L.
	Moroccan green bean	Phaseolus vulgaris L.
	Winged bean	Psophocarpus tetragonolobus (L.) DC.
	Snap pea	Pisum sativum L. var.macrocarpum Ser.
	Broad bean	Vicia faba L.
	Goshu potato	Solanum tuberosum L.
	Irish cobbler potato	Solanum tuberosum L.
	May queen potato	Solanum tuberosum L.
	Yam	Dioscorea japonica Thunb.
	Yacón	Smallanthus sonchifolius (Poeppig) H.Rob.
	Jerusalem artichoke	Helianthus tuberosus L.
	Konjac, devil's tongue	Amorphophallus konjac K.Koch
	Annou sweet potato	Ipomoea batatas (L.) Poir.
	Kintoki sweet potato	Ipomoea batatas (L.) Poir.
	Irish potato	Solanum tuberosum L.
	Kogane sweet potato	Ipomoea batatas (L.) Poir.
	Sweet potato	Ipomoea batatas (L.) Poir.
	Naruto-kintoki sweet potato	Ipomoea batatas (L.) Poir.
	Purple sweet potato	Ipomoea batatas (L.) Poir.
	Glutinous corn	Zea mays L.var.saratina
	Sweet corn	Zea mays L.

Crops	Taro	Colocasia esculenta (L.) Schott
	Takenoko taro	Colocasia esculenta (L.) Schott
	Yatsugashira taro	Colocasia esculenta (L.) Schott
	Celebes taro	Colocasia esculenta (L.) Schott
	Turmeric	Curcuma longa L.
	Ginger	Zingiber officinale (Willd.) Roscoe
	Tea	Camellia sinensis (L.) Kuntze
	Tochuu tea	Eucommia ulmoides Oliv.
	Barley	Hordeum vulgare L.
	Bamboo shoot	Phyllostachys heterocycla (Carriere) Matsum. Var. pubescens (Mazal ex Houz.) Ohwi
	Japanese angelica sprout	Aralia elata (Miq.) Seem.
	Ebisu squash	Cucurbita maxima Duchesne ex Lam.
	Pepo squash	Cucurbita pepo L. var.ovifera (L.) Alefeld
	Japanese pepper	Zanthoxylum piperitum (L.) DC.
	Buckwheat	Fagopyrum esculentum Moench

(Attachment 4)

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