

Hamanaka Town

Severe climate where no plant but grass can grow and advanced dairy farming emulating other municipalities

Hamanaka's hilly land is surrounded by a cold, deep sea fog even in summer. In this area belonging to Japan's coldest region, it is impossible to grow ordinary crops, and dairy farming must be conducted in a manner suited to the severe climate. Despite these disadvantages, local citizens have endeavored to win difficult competitions in the dairy industry by upgrading and adding value to their products. Their steadfast efforts, such as overseas training, invitation of specialists and the introduction of dairy farming support systems, have culminated in the commercialization of quality milk – which has been primarily sold in the metropolitan area and also processed into Calpis lactic acid drinks and Häagen-Dazs ice cream.

1. Overview of Hamanaka

Hamanaka is located between Kushiro and Nemuro in eastern Hokkaido. The low, flat Pacific coast stretches to the southeast of the town, drawing a beautiful arc called Biwase. Like other coastal communities in Hokkaido, fishery has played an important role in the development of Hamanaka. This town developed from a settlement formed in the middle of the long stretch of the Biwase coast in Kiritappu. This place used to be called Hamanaka Basho (fishing ground).

On the mountainous side of the town, low, gently sloping hills extend to the northeast, forming a cattle breeding area where many farmers engage in dairy farming. The majority of this mountainside area is made up of farms, which account for about 50% of the town's overall area. Hamanaka's grassland area is about 15,000 ha in total and the total number of cows is some 23,000 heads – more than three times the town population, producing over 82,000 tons of raw milk annually. With extensive forests formed from the terrace area to the hill slopes, forestry is Hamanaka's other important industry.

JR Hanasaki Line and National Route 44 run parallel west to east through the center of the town. The south side of the railroad is primarily covered with forest and some pastureland, while the north side is a vast pastureland area, which extends to the abovementioned gently sloping hills. In southeast coast, roads from Akkeshi stretch through forests on marine terraces, descending to the coastal Kiritappu Marsh area, from which the roads run through bright coastal landscapes. There are small brackish-water lakes to the south of this coastal area: Hichirippu and Mochirippu, where oysters and clams are raised.

Hamanaka's summer is very foggy; the climate here is one of the coolest in Japan, and the town's warmth index (level of warmth felt by plants) is below 45 degrees – the level indicating a subarctic climate. Vegetation here is also similar to that in subarctic areas. Erman's birch forest and Miyama black alder forest cover the marine terrace and peaty marshes are formed on lowland. Of these marshes, Kiritappu Marsh surrounded with rows of old sand dunes is part of the Akkeshi Prefectural Natural Park. This marsh, characterized by unique vegetation and beautiful landscapes, was designated as a Ramsar site under the Ramsar Convention.

In the Taisho era (1912 – 26), the central part of Kiritappu Marsh was designated as one of Japan's natural monuments under the name of the Kiritappu Peaty Vegetation Community. Beautiful landscapes, such as Kiritappu Marsh, marine terraces, several flat islands and coastal grassland and forest, have become a valuable tourism resource, attracting many sightseers from within and outside Hokkaido.

The coastal area is inhabited by tufted puffins with a unique, beautiful beak. Also, seals gather at reefs and a variety of wild birds fly to the marsh. Many people come to observe them not only in summer but also throughout the year.

2. Industrial development from ecological viewpoints

As mentioned above, Hamanaka used to be called Hamanaka Basho, which means a fishing ground operated before the Meiji era under the contract system authorized by the shogunate and the Matsumae clan. In this system, one local master was allowed to monopolize authority, forcing his subjects to work for him. These

masters may have employed indigenous Ainu people as laborers or drove them away from the coastal area.

In Hamanaka's coastal area, whale fishery, started by the Ainu, continued until the 1960s. At one time, the coast from Nemuro to Kushiro was lined with many whaling bases. The abundance of whales means that the area was blessed with rich ecological resources, which are considered to have been carried here through floating ice from the Amur River.

Hamanaka used to be a famous kelp-producing area, again because of the fertile sea. It was only recently, however, that people became aware of the fact that quality kelp has been produced here because of the existence of marshland. Local people were first unaware of the impact of the inland environment on ecosystems, but they have learned that kelp can grow well because organic iron, supplied from forest and marshland, prevents lime algae from depositing on kelp. With the recognition of this kind of relationship between inland and marine environments, agriculture farmers have come to pay closer attention to inland conditions.

Although the development of Hamanaka began from the coastal area, the inland area also gradually came to be used for agriculture. The cold climate, however, hindered agricultural development in the early days. Farmers primarily engaged in extensive grazing of horses in wild bamboo grassland.

This shift from horses to cattle and the development of dairy farming were facilitated by the introduction of transport systems using the simple track ("development track"), which enabled farmers to gather and carry produced milk swiftly. Milk containers were first carried by horses and later by diesel railcars on the narrow track. This was an extremely effective means of transportation in areas where road systems were underdeveloped.

Meanwhile, as elsewhere in Hokkaido at that time, the problem of wastewater from farmland, resulting from the increase in the number of cattle and the enlargement of management scales, has become serious, causing pollution not only to the farmland itself but also to the lower reaches of the area.

To solve this problem, the Town of Hamanaka has promoted environment friendly agriculture to enhance the quality of local products, so that they will be highly appreciated by consumers.

3. Characteristics of Hamanaka agriculture

One of the greatest driving forces for the rapid agricultural development in Hamanaka over the last half-century is the efforts of leaders in local agriculture, including farmers and the managing staff of agricultural cooperative. These local leaders have developed advanced skills and theories, and broadened their perspectives through training in foreign nations, where they learned how agricultural strategies are implemented there.

Also, to overcome various problems hindering local development, the Town of Hamanaka has actively invited experts from within and outside Hokkaido and followed their advice effectively in promoting various measures.

These attempts overlap with those conducted by early Hokkaido settlers. At that time, engineers and experts in various fields were invited from foreign nations with climates and histories similar to Hokkaido's. Our ancestors learned modern farming focusing on dairy farming, and farm product processing technologies from these experts, playing an important role in laying the foundation of modern Hokkaido agriculture.

Also, to implement agricultural development projects smoothly, such as the establishment of the Dairy Farming Technology Center and the introduction of dairy farming support systems, the Town of Hamanaka has prepared specific plans carefully, by obtaining local consensus in consideration of advanced examples and advice from experts in and outside Japan. Through these projects Hamanaka has succeeded in improving quality while



Grazing of cattle – a scene typical of Hokkaido



Milking facility

reducing costs. As a result, Hamanaka's products have won the firm confidence not only of Japanese companies (Takanashi Milk Industry, Co., Calpis Food Industry Co., etc.) but also leading international companies such as Häagen-Dazs.

In addition, related organizations and local groups have cooperated in developing comprehensive support systems for local farmers and prospective farmers of the future, contributing to the strengthening of local human networks.

(1) Utilization of local resources

A food shortage is expected to occur in the 21st century. Dairy farming, meanwhile, is free from such fear because cattle are fed grass, not a food facing human competition. Rather than saying that Hamanaka is blessed with abundant grass resources, it may be better to say that almost no natural resources other than grass are available in Hamanaka. To maximize this resource, it is necessary to establish pastureland at places suitable for raising feed grass. As mentioned before, Hamanaka is one of the municipalities that belong to the coldest region in Japan; thus, it is impossible to raise plants other than grass. This obstacle in promoting agriculture, however, also works as a merit in raising grass, partly because it helps prevent damage caused by diseases and harmful insects, thus enabling farmers to use less agricultural chemicals and to produce dairy products of higher quality.

Dairy farming in Hamanaka has developed by maximizing this abundant and high-quality natural resource. Another factor behind the development of dairy farming in Hamanaka is sufficient labor force; all family members participate in raising and milking cows, and there are many experts of dairy farming in local organizations.

Also, waste from dairy farming, such as livestock excreta that cannot be avoided when raising animals, has been returned to farmland by scattering it as manure. In recent years, advanced systems to manage waste and control scattering amount have been introduced. Also, to reduce the impact of the livestock waste on lower reaches (Lake Furen), forest lanes have been established along valleys. These forest lanes, in conjunction with wild grassland, small marshes and ponds, are also expected to function as village biotopes in the future.

These measures have helped improve village landscapes and enhance village functions, contributing to producing farm products that are highly valued by consumers.

(2) Agricultural management to win in market competition

In 1993, the Japanese Government decided to remove restrictions on the import of dairy products. Tariff rates are also scheduled for review in 2001. With the age of domestic competition coming to an end, dairy farmers are now required to win in international competition. Because Japanese dairy farming is notorious for being the most costly in the world, it is imperative for farmers to make incessant efforts for cost reduction. To this end, Hamanaka farmers should produce and use grass resources efficiently by introducing thorough management systems of grass. When farmers construct cattle sheds and facilities or purchase agricultural machinery, which require a large investment, they should do so in careful consideration of their own management scales and priorities.

It is also necessary for farmers to endeavor to reinforce their production bases by introducing large, modern facilities and machinery that will help them expand their businesses while pursuing cost and labor efficiency. In recent years, it has become increasingly important to conduct research by gathering data and using advanced equipment and tools for analysis. To help Hamanaka farmers address these diverse challenges positively, the Town of Hamanaka has promoted agricultural management suitable for this extensive dairy farming area through various measures utilizing a variety of agriculture support systems, so that local farmers can live comfortably by securing stable incomes.

Hamanaka-produced quality milk has been used as material for Häagen-Dazs ice cream. This is because Hamanaka succeeded in developing modern, high-level dairy farming management systems and their support systems earlier than any other Hokkaido municipality.

(3) Development of Agricultural households and local area through dairy farming support system

Hamanaka has been successful in promoting high-quality milk under the catchphrase "producing milk in a town with no golf courses." Although the town shares some problems with other Hokkaido municipalities, like decreasing number of Agricultural households, Hamanaka has endeavored



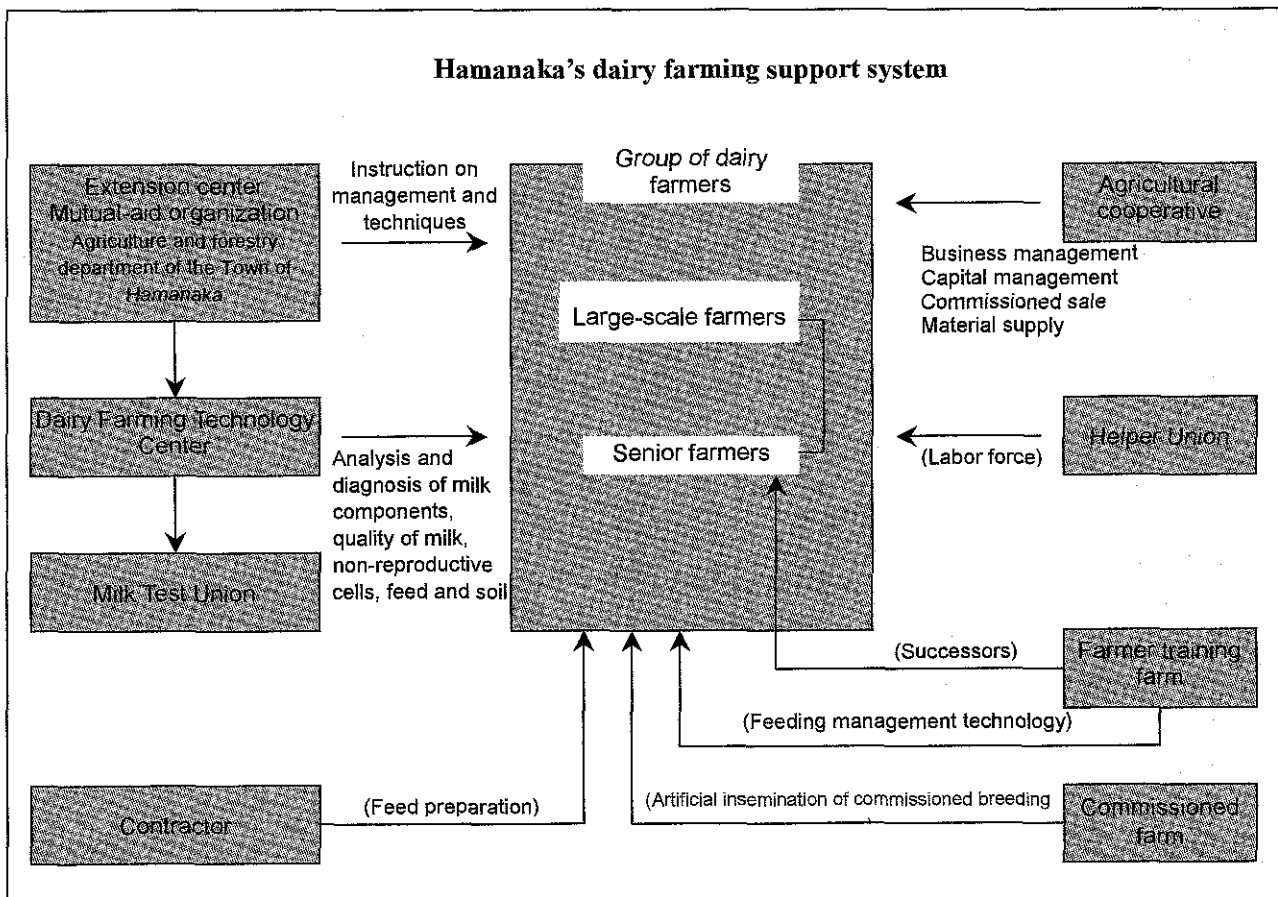
Training farmland

to overcome these problems by supporting large full-time farmers and by developing well-organized dairy farming support systems. As farmers expand their operation scale, they will have more difficulty managing all the jobs with family labor. Technological and operational management also will become more complex.

Once heavily equipped with agricultural machinery, farmers should endure the burden of depreciation while increasing income.

Of domestic municipalities, Hamanaka is in the forefront of addressing these challenges through the introduction of dairy farming support systems.

As mentioned above, the larger the management scale of a dairy farmer, the more difficult it is to manage



all the jobs by family labor. Also, the enlargement of management scale will expose other problems arising from independent operation of dairy farming. To help local farmers overcome these problems, Hamanaka has decided to develop a support structure and introduce work-sharing systems. Hamanaka's support system consists of the following components. The Dairy Farming Technology Center controls production and offers information for technological improvement. The contractor system relieves local farmers from the burden of paying machinery depreciation costs and from vying for labor forces for cattle shed jobs. The Helper Union enables local farmers to have days off. The Calf Breeding Farm raises and controls livestock animals, thus lessening farmers' labor and solving feed shortage problems. The agricultural cooperative supports farmers

in improving their management. These components work in cooperation to help farmers improve management to produce quality products.

(4) Emulating other municipalities

The Town of Hamanaka has endeavored to improve agricultural environments, firmly believing that it is only through such efforts that farming villages will become more beautiful and attractive, thus encouraging farmers to produce farm products that will be highly valued by consumers.

To this end, the town has collected information on many examples in advanced regions and has sought advice from experts within and outside Japan. Hamanaka townspeople have been particularly eager to learn from foreign nations.

There is a significant example of such forward-looking citizens: a local pastureland owner who succeeded in reducing labor costs by improving productivity and reducing the size of his pastureland. This success has enabled him to start cheese production and increase income. This man, who learned dairy farming methods in Denmark and France when he was young, says that his experience in foreign countries has greatly helped him in realizing his business success.

Also, Mr. Noda, the vice councilor of the agricultural cooperative, visited India and Nepal when he was young, to learn how to promote agriculture under severe climates. He also attended a training program in Denmark, a leading nation in dairy farming. Mr. Ishibashi, head of the agricultural cooperative, also received training in Denmark and U.S.A.

Although many people working for agricultural cooperatives and municipal governments in Hokkaido have similar experiences, these three people in Hamanaka are unique in that they are extremely enthusiastic about maximizing their experiences by sharing their expertise with local people. Such enthusiasm has greatly contributed to the development of the town. Another success factor of Hamanaka is attitude to obtain and maximize advice from experts by inviting experts from within and outside Hokkaido, so that the municipal government can proceed with their development projects effectively.

It should also be noted that Hamanaka's methods for the development of human resources and farming technologies have much in common with those employed by early Hokkaido settlers, who endeavored to learn technologies from many Japanese and foreign experts.



Facilities for breeding calves

4. Local development through establishment of a recycling-oriented society

As mentioned above, the Town of Hamanaka has promoted local revitalization projects by incorporating the primary industry (centering on dairy farming and fisheries) and tourism resources, such as Kiritappu Marsh, registered under the Ramsar Convention. The municipal government, agricultural and fishery cooperatives, producers and local citizens have cooperated in developing a recycling-oriented society to preserve and enhance local ecosystems.

To this end, each project is carefully planned by obtaining local consensuses in consideration of advanced examples and advice from experts in and outside Hokkaido. This has enabled the town to implement various projects smoothly, such as the establishment of the Examination Center and the dairy farmer support system.

Also, the municipal government has enthusiastically sought advice from experts in and outside Hokkaido in promoting local revitalization projects and in solving various local problems.

Hamanaka's recycling-oriented society consists of two systems: physical recycling system, which helps promote local industries centering on dairy farming; intelligent recycling system, which promotes comprehensive regional revitalization through the improvement of local environments utilizing ecosystems.

Under the former concept, Hamanaka's handicap in promoting agriculture – difficulty in raising plants other than grass due to the severe climate – has been changed into an advantage. The grass has been turned into a resource by making quality grass that is less subject to damage from diseases and insects and helps reduce the use of chemical fertilizers. The livestock excreta, which have been a nuisance, are now applied to pastureland as

manure. In this way, a recycling system in dairy farming has been developed by feeding cows not with imported fodder but with locally producing grass and by returning their excreta to the grassland.

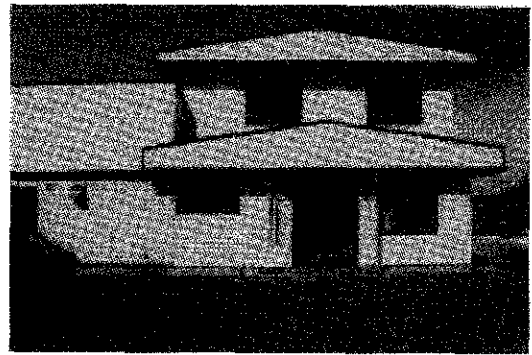
As a result, Hamanaka has succeeded in improving pastureland landscapes and functions, in producing farm products that are highly valued by consumers and in reducing production costs. The Dairy Farming Technology Center has played a leading role in promoting these projects, as well as in collecting and sending information.

The latter system – intelligent recycling system – serves as the basis for Hamanaka's comprehensive attempts incorporating dairy farming, fishery and tourism. As elsewhere in Hokkaido, Hamanaka has come to suffer from environmental pollution caused by wastewater of farmland. This has been caused by the increase of cattle and enlargement of management scales. This wastewater has polluted not only the farmland itself but also lower reaches of the local area through rivers, deteriorating the environments of the fishing grounds. To conduct wastewater treatment effectively, Hamanaka has deemed it necessary only to return the waste to farmland by spraying as fertilizer, but also to manage the waste and control the spraying amount appropriately. To prevent the waste from damaging the environment of lower reaches, forest lanes have been established along valleys. A wild plant garden, a small marsh and a pond have also been established, to have them function as village biotopes in the future.

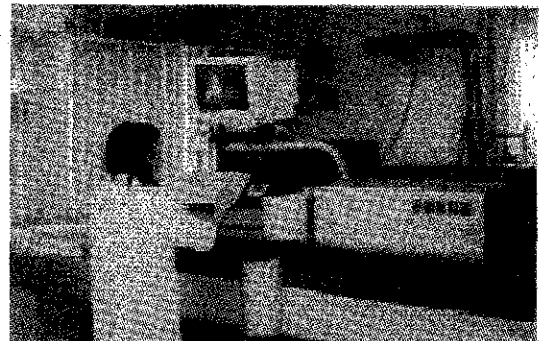
Through these attempts, Hamanaka has succeeded in maintaining pastoral landscapes with cattle grazing leisurely, and in using the beautiful landscapes as tourism resources. In fishery, Hamanaka has promoted measures to preserve marshland, and improved forests to be used for forestry and stock raising, and to ensure that organic iron and other nutrients are supplied from marshland and forests to fishing grounds. Marshland and forests also help secure sufficient supply of water and control water temperature.

The Kiritappu Shitsugen Center has played a central role in promoting local development in harmony with the environment, by maximizing natural resources of the local area, such as Kiritappu Marsh, variably changing coastlines and wildlife living there. The center endeavors to promote local revitalization by promoting exchange projects, such as eco-tours targeting tourists and school trips for urban high school students to have them work and stay with farmers and experience agriculture, forestry and fisheries.

What is significant in Hamanaka's attempts is that not only farmers but also all the local people have been involved in the promotion of environmentally friendly agriculture to realize a recycling-oriented society. As a result, it has become possible to circulate local resources (human, physical, financial and information resources) in and outside Hamanaka, greatly contributing to local revitalization.



Outlook of the Dairy Farming Technology Center



Equipment for analysis installed at the Dairy Farming Technology Center

Takasu Town

Appropriate naming of tomato juice

A new specialty was produced through citizens' attempts to process extra tomatoes for home consumption into juice and make up the deficit of intake of brightly colored vegetables in winter in the hope of improving eating habits.

The tomato juice named after its scientific name meaning "wolf peach" became popular because of its unique naming and the fact that it contains no additives and less salt. It has taken hold as a regional specialty, through sales strategies making use of its characteristics, to revitalize the region.

1. Overview of Takasu

(1) Regional characteristics

Located in the central part of Kamikawa Subprefecture (northern Hokkaido), the Town of Takasu is in a basin surrounded by mountains 300 m to 600 m above sea level from north to southeast. Mountains, forests and plains account for approximately 34% of the total area of the town (13 km²). The Osarappe River, which flows into the Ishikari River, runs through the central area of the town from north to south. Much of the flat land stretching along the river is arable, including rice fields of approximately 4,168 ha and dry fields of 822 ha (as of 1999). The town has plenty of ideal agricultural land which is rich and suitable for rice production.

Since Takasu is in a basin, its climate is characterized by great temperature differences between hot summers and extremely cold winters, which is typical of an inland climate. In January and February, the temperature drops to -30°C or lower, and in August, it rises to nearly 30°C. The temperature difference between summer and winter stands at 60°C. The good effects of the summer heat make the town famous as one of the most important producing centers for high-quality rice in Hokkaido, as shown by its high rice production per unit and its high percentage of first-grade rice shipping.

Takasu was first developed in 1891, and it was established as a village the next year. In 1924, the former Takasu Village was separated into three villages (Takasu, Higashi-Takasu and Etanbetsu). The new Takasu Village was reorganized into a town in 1969. Its population continued to decrease after it reached its peak of 10,658 in 1956. The town was designated as an underpopulated area in 1970, and the population decreased to 7,130 in 1975. Since Takasu is adjacent to Asahikawa City (population 364,845 as of September 1998), the second largest city in Hokkaido, and residential land development for commuters to Asahikawa was conducted in some areas in the town, the population of Takasu began to increase after 1975. Since 1980, it has been decreasing again because many people abandoned farming. The present population is 7,332 as of April 2000.

Takasu has developed with agriculture as its key industry since its establishment as a village. The workforce in primary industries accounted for approximately 88% in 1955, which greatly decreased to approximately 35% in 1995. On the other hand, the tertiary industry workforce greatly increased from 9% to 47% over the same period.

By the effects of Asahikawa-Takasu Interchange of the Do-o Expressway, which was opened for traffic in 1990, the industrial structure of the town is showing signs of change, including the development of an industrial park.

(2) Development processes of agriculture in Takasu

Agriculture in Takasu has developed, centering on rice growing, since its establishment as a village due to the inland climate which brings high temperatures in summer, the area's rich land and water brought by the Osarappe River. In 1965, the rice acreage accounted for 81% (3,710 ha) of the total arable land (4,580 ha). Rice accounted for 92% (¥1,411 million) of the total gross agricultural production value (¥1,527 million). Thus, it can be said that the agricultural structure in the area at that time was built by a single crop, rice.

Other agricultural categories include stock farming centering on dairy farming (¥58 million; 4%) and vegetables (¥42 million; 3%).

Takasu has two agricultural cooperatives: Takasu Agricultural Cooperative and Kitano Agricultural Cooperative, both of which were inaugurated in 1948, shortly after World War II (hereafter referred to as "JA Takasu" and "JA Kitano," respectively). For JA Takasu, arable land of one farmer was relatively large, and the only kind of farming other than rice, introduced until the 1970, was stock farming (dairy farming and poultry farming). On the other hand, JA Kitano had many farms of relatively small size, and vegetable growing was introduced at an early stage of development since it is adjacent to Asahikawa. Green vegetables and beans were produced as main items at the beginning, but growing cucumbers and eggplants became popular around 1960 because their profitability is high. In 1963, Kitano Vegetables Shipping Association was organized as a producers' association, and the area was nationally designated as a producing center for "summer-autumn cucumbers" in 1975.

The area, like other rice growing areas, was influenced by a policy to cut back rice acreage under cultivation which started in 1970. Takasu was particularly influenced by the policy because its production structure centered on rice growing. As a result, the policy deprived farmers of their will to raise crops, increased the number of farmers who abandoned farming or who got involved in other businesses and accelerated the decrease in population. In 1975, five years after the policy started, the rice acreage was 3,000 ha, decreasing to approximately 67% of the earlier total. The number of farming families was 1,423 in 1965, which decreased by 284 to 1,139 in 10 years. Of them, the number of full-time farmers was 955 (67%) in 1965, which greatly decreased to 320 (28%) by 1975. The ratio of full-time farmers and part-time farmers was reversed. During the same period, the total population of Takasu decreased most greatly by more than 2000, from 9,279 to 7,130. Such an increase in the number of people who abandoned farming/started another business was not caused only by the policy but also by other important factors: there were many employment opportunities because the town is adjacent to Asahikawa, the second largest city in Hokkaido, and agricultural land continued to be converted to residential areas by the effects of urbanization.

Figure 1 shows trends of growing different crops in rice fields by crop after the policy was initiated. The area of the former rice fields where different crops were grown increased rapidly by the early 1980s, especially feed crops and wheat, which are grown on land used relatively extensively. While the area of fields planted with extensive crops decreased from the late 1980s, vegetable production increased steadily, accounting for a larger part of the grass output. In 1979, JA Takasu organized "Vegetable Growing Promotion Association of Takasu Agricultural Cooperative," and vegetable production began to be popularized and take hold all over the town.

On the other hand, although rice acreage decreased, rice production per unit was at the level of 500 kg/10 are until 1976 increased later and exceeded 600 kg/10 are depending on the year, like 1984.

During this period, the situation of Takasu was obviously different from those of neighboring municipalities where, by the effects of the policy, vegetables were introduced immediately and broadly as a factor of multiple farming with rice growing. In addition, having two agricultural cooperatives in the town may be one reason why the formation of vegetable production centers was delayed. Mass sales stores played the leading role in promoting wide-area, large-scaled distribution of fresh vegetables; therefore, producing centers were inevitably requested to enlarge their product lots. However, there were no joint activities between the two agricultural cooperatives in Takasu. In fact, market appraisal of cucumbers provided by JA Kitano became higher, but JA Takasu produced no cucumbers. Instead, spinach and green onions were produced widely.

As will be mentioned later, it was not until Takasu Agricultural Promotion Corporation started uniform collection and shipment of vegetables that producing centers were formed through cooperation between the two agricultural cooperatives.

Meanwhile, growing of items which would lead to production of local specialties (to be mentioned later) started in the late 1970s. They include stevia, an ingredient in natural low-calorie sweeteners, on which hopes were pinned as a promising product. With the establishment of a producers' organization, "Stevia Research Society," the number of stevia producing farms increased to 37, and cultivated areas were enlarged

to 12 ha in 1984. However, stevia was increasingly imported, and its production in the town came to an end by 1992. In 1982, growing of sunflowers started as part of the rotation, although few are planted at present because they cause damage to the land.

Fig. 1 Changes in paddy fields use

(Unit: ha)

Year	Rice growing	Total acreage of different crops	Feed crops	Wheat	Buckwheat	Beans	Vegetables	Flowers	Sunflowers	Stevia	Crops to improve soil fertility	Others
1970	2,870	13.2	6.7	0.0	0.0	1.2	3.7	0.0	0.0	0.0	0.0	1.6
1975	3,000	778.6	480.0	0.0	147.4	37.5	39.4	0.3	0.0	0.0	0.0	74.0
1980	2,390	1,309.8	661.1	410.7	62.7	110.9	44.1	0.0	0.0	0.0	0.0	20.3
1985	2,670	1,019.1	307.9	388.8	79.4	152.6	61.3	9.0	2.9	17.2	0.0	0.0
1990	2,390	1,227.7	228.3	267.8	152.7	318.8	69.4	16.5	8.4	11.5	154.3	0.0
1995	2,870	603.8	267.3	14.4	60.6	74.9	51.9	21.8	1.3	0.0	103.9	7.7

Source: prepared from Takasu Municipal Office data

(3) Development of community building with the slogan “Health is Most Important” and production of local specialties

At present, Takasu is evaluated highly nationwide as a town of positive health and social welfare. Such community building based on “creation of a healthy and affluent rural community of social welfare” was advocated concurrently with the election of the village mayor in 1967 and began development with consideration for rapidly advancing aging of the region. At the beginning, emphasis was placed on educational activities for improving health of citizens, early diagnosis and prevention of diseases. In and after the late 1970s, when such activities achieved certain results, improvements in health and physical strength and sport promotion were also addressed. In the 1980s, results led to improvement in eating habits/processing of local specialties, as will be stated later in detail.

“Comprehensive Health Examination (“Mini Dock”), starting in 1975, was the achievement of an initial goal and a turning point for the development of improvements in eating habits. This effort was made for the prevention, early diagnosis and treatment of adults diseases, which occupy higher ranks as causes of death for citizens 30 years of age or older who were engaged in farming and business or housewives, because they did not have opportunities to take health examinations at their workplaces. Concurrent to the examination, a “survey on eating habits” of the subject was conducted.

The findings showed that they ate too much salt and not enough green vegetables in winter, and measures to improve eating habits were discussed.

It was tomatoes which attracted the most attention. Although tomatoes produced in Takasu were not merchandized, almost all of the farmers grew tomatoes for home consumption and there were always fully ripened tomatoes left in the gardens of farmers who grew too many and did not harvest them. Officials of the town office and public health nurses examined ways to use such tomatoes left over from summer. As a result, they decided to make tomato juice to cover the deficit of vegetable consumption in winter because it is a relatively easy way to process and preserve tomatoes, compared with other processing methods.

Immediately after the decision, officials in charge of the matter visited places with advanced tomato juice processing to inspect their facilities, and research and preparation were conducted. In 1981, a facility of the town was remodeled into the Takasu Temporary Agricultural Products Processing Facility. When this facility was constructed, the Special Project as Measures to Promote Underpopulated Regions was applied (independent project by the Hokkaido Government).

In the beginning, farmers brought their tomatoes to the facility, processed them by themselves while learning how to manufacture juice from the officials in charge, and consumed the juice for themselves. They began to distribute it to their relatives and friends. Takasu juice has less salt and greatly differs from that of canned juice on the market; therefore, juice made in Takasu became popular among people even outside the town. The processing facility was used 77,971 times in 1981, which rapidly increased into 176,071, more

than twice as many, the following year.

The facility was used not only for making tomato juice, but also for making miso (fermented soybean paste) and sunflower oil. The former was made from harvested soybeans and rice and the latter was made from sunflower seeds, which were produced in rotation. Thus, the number of items processed in the facility also increased.

The effort to produce tomato juice was widely made as part of the "one-village, one-specialty campaign," which was advocated by the Governor of Hokkaido in 1983. Exhibiting the juice at the First New Frontier Festival, held in Sapporo, gave people the first opportunity to see it. Before the exhibition, the name of the juice was considered, but no good names were suggested. A dietician, who had just graduated from university at that time found after looking up a food encyclopedia that the Latin scientific name for tomato means "wolf peach." Finally the name ("Okami-no-momo" in Japanese) was adopted. Although the number of bottles exhibited at the festival was only several hundreds, the interesting name attracted public attention, and the town office received inquiries for sales of the tasty, additive-free juice with low salt.

At this time, town officials and the director of the tomato section (JA Kitano) played a major role for two years between 1984 and 1985 in organizing a group named "Blue & Red (B & R)" consisting of 10 farmers, and starting processing and sales of the juice by using a facility of the agricultural cooperative. Although production increased from 20,000 bottles in 1984 to 30,000 bottles in 1985, there were more purchasers than expected, and production capacity could not meet the demand. It was urgent to establish a full-scale system to increase production

2. Roles played by the local government and agricultural cooperatives and the development of production of local specialties

(1) Project development of "Takasu Agricultural Promotion Corporation"

Under the conditions mentioned above, the municipal government, JA Takasu and JA Kitano provided capital of ¥10 million each – ¥30 million in total – to establish a third sector, Takasu Agricultural Promotion Corporation (hereafter referred as the "Corporation"), in 1986, which specializes in food processing projects centering on "Okami-no-momo."

For sharing of roles regarding "Okami-no-momo," the municipal government temporarily loaned officials to the Corporation for its operation, while the agricultural cooperatives arranged plans for cultivated areas of producers in their jurisdictions, varieties to be planted and quality control, among other items. Moreover, each of the agricultural cooperatives organized a "material tomato section" and tried to make speedy arrangements, as well as popularize and improve technology through the use of relationships between farmers. The temporary loan of municipal officials to the Corporation ended in 1996, and all members of the Corporation became regular employees, except for part-time directors. As of 2000, the Corporation had 10 regular members and employed approximately 100 temporary workers. Of them, two members and 37 temporary employees were involved in manufacturing "Okami-no-momo."

Production of "Okami-no-momo" rapidly increased from 208 kl in the first year, to 346 kl in the next year 1987, and to 454 kl in 1988 (See Fig. 2 for details.).

Fig. 2 Change regarding material production and manufacturing of “Okami-no-momo”

Year	Material production						Production	
	Number of farmer households	Cultivated area (a)	Shipment (t)	Production per unit (production per approximately 10 are) (kg)	Total amount purchased (¥10,000)	Unit purchase price (¥/kg)	Amount produced (kl)	Operated days
1986	68	371.2	225.4	6,073	—	—	208.5	47
1987	100	765.4	394.5	5,154	—	—	345.8	50
1988	106	884.3	532.8	6,025	—	—	455.0	49
1989	99	832.6	371.0	4,456	2,250	60.6	302.2	49
1990	93	643.5	550.3	8,552	3,567	64.8	444.9	55
1991	85	775.3	476.9	6,151	—	—	385.2	53
1992	83	707.8	417.5	5,899	—	—	342.3	49
1993	85	685.5	565.4	8,247	4,829	85.4	479.7	58
1994	94	712.4	531.9	7,466	4,896	92.0	419.9	58
1995	91	819.9	559.9	6,829	5,481	97.9	457.8	63
1996	90	849.1	662.2	7,799	6,516	98.4	525.6	68
1997	91	834.0	660.0	7,914	6,673	101.1	566.6	68
1998	93	843.8	733.1	8,688	7,355	100.3	625.1	59
1999	92	885.1	663.6	7,498	6,925	104.4	532.1	55
2000	101	997.4	657.8	6,595	6,785	103.2	—	57

Source: Data from Takasu Agricultural Promotion Corporation

Note: (—) indicates that values are not known.

In the 1990s, extension of production periods and operated days and stabilization of material collection allowed production to increase, although there were changes over the years. In 1996, ten years after the establishment of the Corporation, production rose to the 500 kl level (525 kl), and it reached 625 kl in fiscal 1998.

The quantity of production equals the sales amount; purchasers are ensured of selling all products. Production reaches the limit of the capacity of current facilities, which cannot be said to meet the current demand. Stabilization of material supply and sales strategies will be stated in detail later.

Seeing the development of other food processing projects, it has been found that production of miso (the trade name: “Takasu-no-miso”) was introduced in the beginning. Since the production period of “Okami-no-momo” is only three months from summer to autumn, miso has been manufactured to use the facilities effectively in winter.

Moreover, pressing sunflower oil, which was commissioned to a company in Asahikawa from 1988, became a project of the Corporation. In addition, production of a natural sweetener, “Stevia-no-sato,” started in 1989.

In 1997, “Tomato Yokan” (sweetened bean-jelly) using “Okami-no-momo” appeared as a new product. In recent years, the development of the product has been commissioned to a private enterprise.

Establishing a system to increase production of “Okami-no-momo,” a specialty of the town, was the direct reason for the establishment of the Corporation, which aimed to increase value-added agricultural products and improve the health of citizens.

This was concurrently expected as the development of the second or third category following the category of rice, in order to change the regional agricultural situation, where operation was still centering on rice growing although growing of different crops was encouraged since the policy to reduce rice acreage started 10 years ago.

This became clear when a facility to collect and ship vegetables was established three years after the establishment of the Corporation (1989). Since the following year, the Corporation has been in charge of uniform collection of vegetables and flowers produced in Takasu, for which agricultural cooperatives should be responsible because they are originally in charge of sales activities. Enlargement of the lots through the arrangement by the Corporation led to the enhancement of the producing center’s reputation. With increased

production as one reason, the gross production value of vegetables in Takasu accounted for 12% of the total – exceeding 10% for the first time – being recognized as the second category following the rice sector.

To establish the facility to collect and ship vegetables, the municipal government, JA Takasu and JA Kitano provided additional capital of ¥30 million each, and one member of each agricultural cooperative was loaned to the facility to be in charge of vegetable collection and shipment.

(2) A system to produce and collect material tomatoes

Farmers who produce material tomatoes, in principal, belong to the material tomato section organized by each cooperative to participate in planning of cultivated areas. The Corporation suggests necessary acreage of areas to be cultivated, which are then allotted to each of the two agricultural cooperatives. The allotted areas are apportioned to each producer by the cooperatives and sections from December to January. With no restrictions, including an upper limit of area for a farm household, cultivation acreage is allotted to a farmer according to his management situation. On another note, some non-contractor farmers who do not belong to the section bring the remainder of their tomato crops to the Corporation after producing juice for home consumption. Such remainders are used as material as much as possible.

The number of contractor farmers was 68 in the first fiscal year. From the beginning, production was conducted by many farmers, and the number exceeded 100 in the next fiscal year, showing the stabilization of material supply. This is not simply because all the farmers have been growing tomatoes for home consumption. The main reason is that policies for production, collection and shipment conducted mainly by the Corporation were effective.

The factors of stabilization of material supply are as follows.

First, the Corporation took measures to support contractor farmers, by providing containers for collection free of charge and commissioning carriers with transportation from the gardens of the farmers in order to reduce shipment workload. This allowed the farmers to reduce workload and cost required for collection and shipment. Since almost all of the farmers operate centering on rice, key workers are responsible for rice growing, and elderly workers are in charge of tomato production as their sideline, in individual farm households. Reduction of workload, therefore, was an important problem.

Secondly, it was also important that material tomatoes were purchased at a flat rate according to ranking. In general, vegetables are shipped and commissioned as fresh products to a wholesale market, where prices change every day according to supply and demand.

Accordingly, if farmers introduce vegetables in the view of gaining high profits, risks caused by price fluctuation are also high. The stabilized price of tomatoes purchased at a flat rate according to ranking probably gave an incentive to farmers who hoped to have guarantees of reproduction prices.

Purchase prices are fixed by the Corporation and representatives of the farmers every June, and unit prices are classified into five ranks from A to E according to quality. Contractor farmers are guaranteed prices of Rank C at least, and unit prices of tomatoes brought by non-contractor farmers who do not participate in planning of cultivated areas are Rank B at best even if they are of superior quality.

The mean unit price calculated from annual purchase records of the Corporation was approximately ¥61/kg in 1989, which has exceeded ¥100/kg since 1997. Such increase of unit prices show that steady sales achievements have allowed increase of fixed prices, and that quality has leveled out high.

The third factor is supporting measures to lengthen production periods. To increase production still using the capacity of the current facilities, it was necessary to lengthen production periods by dispersing harvest periods of material tomatoes to some extent. As policies for this purpose, the municipal government and the agricultural cooperatives subsidized half of the expenses required to establish greenhouses, and the Corporation offered bonuses for earlier shipment. As bonuses for early shipment in July, an additional ¥20/kg was provided.

In the beginning, after the establishment of the Corporation, all tomatoes were grown outdoors. Because of this, harvests were possible only from early August, concentrating on mid-August in particular. Accordingly, the production period was from mid-August to end September (approximately 47 days), meaning that the facilities were used inefficiently. At present, the production period starts in early July, enlarging

production achievements.

The number of farmers who grow material tomatoes in greenhouses has increased, accounting for nearly 50% of the total. Subsidizing half of the expenses to build greenhouses was not only for material tomato production, but also for all other vegetables. However, the Corporation, along with the municipal government and the agricultural cooperatives, took part in subsidizing 75% of the expenses to built greenhouses for material tomatoes from fiscal 2001.

(3) Characteristics of sales strategies for “Okami-no-momo”

In the case of “Okami-no-momo” in Takasu, it has already gained a reputation since the beginning of production and has received requests from retail shops. Thus, production began with certain quantity of demand, which was surely a lucky start. However, finding sales strategies making the use of the product as a local specialty can also be said to be a factor for its success today.

The distribution channels used by the Corporation can be largely classified into two. One is the distribution channel through which products are sold to department stores via special distributors, while the other is to deliver products directly to consumer’ houses. For sales amounts, the former accounts for 90%, and the latter for 10%. In both, sales to locations outside Hokkaido account for 70%, and sales within the prefecture, especially to Sapporo and Asahikawa, account for 30%. For sales outside Hokkaido, purchasers are concentrated in Tokyo, Kanagawa and Chiba and other prefectures in the Kanto region, accounting for 80%. The rest of the locations outside Hokkaido to which products are shipped range from the Kyushu to Tohoku regions.

Sales promotion was assumed by municipal officials on loan, who were not specialists in that matter. At the beginning, they aimed to sell the products through local individual shops in Takasu as a firm foothold and ensure sales in department stores in Asahikawa, a consuming place nearest to the town. However, the high quality of the product gained its good reputation, and there was a rush of orders for the product even from Honshu. Such big orders from an increased number of purchasers could not be dealt with by the Corporation alone, which did not have expertise in sales, and it was very beneficial to commission shipment to a special distributor although the profit ratio was lowered. Moreover, under the situation as it is where the production quantity cannot fill all orders because of the limitation of the facility capacity and operational hours, shipment adjustment is commissioned to distributors at their own risks. Important strategies for increasing added value of the product to end users included sales in department stores which emphasize brand names, instead of sales in mass sales stores whose sales point is reduced prices.

Sales through the other distribution channel, delivery to individual consumers also increased by word of mouth, centering on demand for the products as gifts. The number of registered customers stands at 10,000 at present, and there are many repeat customers. Although such sales account for only 10% of the total sales, profits from them account for a larger part of the total profits, making the distribution channel important. Filling such small-lot orders was made possible in 1990, and sending direct mailing started in 1994.

Emphasized most strongly in the sales strategy for “Okami-no-momo” is making the best use of its characteristic as a local specialty product. As the Corporation is a third sector company, the organization cannot do what a private enterprise can do through big capital. However, the Corporation looks at sales strategies from a different angle; a small company has its own advantages, which may serve as a sales point. In other words, the Corporation decided not to compete with private enterprises on the same stage, regarding its disadvantage as an advantage.

In the case of “okami-no-momo,” since there have been no facilities to adjust production fully and only local tomatoes are used, the taste changes from year to year, or depending on production periods. However, this is the very characteristic of a local specialty, contributing to its growing reputation. In addition, with no facilities for quick cooling, products have been bottled without using PET bottles or paper boxes. Bottling the products, however, makes them different from other tomato juice products, mass-produced by private enterprises, and allows them to escape from price competition.

3. Good results brought to Takasu and its agriculture by "Okami-no-momo"

As a good result brought to the region by "okami-no-momo," it contributed to the revitalization of the region through its success as a local specialty. "Okami-no-momo," which appeared as part of the eating habit improvement campaign with the Slogan "Health is Most Important," represents the achievements of past community building efforts, giving the whole region confidence which serves as a source of regional revitalization.

Even after the establishment of the Corporation, citizens did not stop processing food products for home consumption. The processing facility has been operated and used by many citizens. It is a place for citizens to not only process foods to improve their eating habits, but also to interact with each other. The facility was repaired in 1996, and the name was changed to "Shiki-no-sato." Classes for making homemade ice cream, bread and rice cakes, as well as tomato juice and miso, are held there, and used by more than 6,000 people in some years. (A total of 6,106 people used the facility in 1996.)

"Shiki-no-sato" can be said to retain vitality in producing the second and third local specialties following "okami-no-momo."

As the second result, production of material tomatoes served as a factor in popularizing vegetable production and allowing it to take hold in agriculture in Takasu, which was heavily dependent upon rice growing. Sales of material tomatoes (total amount of purchase from farmers) was ¥66.72 million in fiscal 1997, the third largest amount of sales, following those of cucumbers and green onions. The figures clearly show the importance of tomatoes in vegetable production in Takasu. Moreover, the number of farm households who produced tomatoes was 91 (contractor farm households alone), standing in the first rank and outdistancing those producing cucumbers (57) and green onions (31).

As stated above, farmers who produce material tomatoes are given support in work of vegetable collection and shipment, and their prices are stable, reducing the burdens on farmers who attempt tomato production for the first time. Under the situation where rice prices have fallen, such policies encourage farmers to understand the attractiveness of growing high-profit vegetables.

In consideration of the development of vegetable collection and shipment work conducted by the Corporation, tomato production has more significant effect on vegetable production. The start of uniform collection by the Corporation promoted not only joint correspondence to the market by agricultural cooperatives, but also exchanges within the farmers' sectional activities). As a result of promoted cooperation and exchanges between agricultural cooperatives, production of cucumbers, which had not been produced in the jurisdiction of JA Takasu, was popularized there, as a visible change. Moreover, in agricultural gross production value, the vegetable output exceeded ¥500 million (¥599 million) for the first time in fiscal 1990, the year after collection and shipment work started. It has continued to account for 10% of the total gross agricultural output, showing that vegetable production in Takasu has begun to take hold as the second category.

When considering the development of projects conducted by the Corporation, creation of employment opportunities should be taken as the third result. As stated above, the Corporation employs 100 temporary employees annually. Since the population of the town is only 7,000, this figure cannot be said to be small. In fiscal 2000, the oldest temporary employee was 76 years old, and the youngest was 18 years old.



"Okami-no-momo"

Koshimizu Town

Soil is Our Life – Exhaustive Challenge for Soil Fertility Improvement

Modernization of agriculture, in its process, previously depended on mass application of chemical fertilizer, and damage to soil entailed by lack of organic material and generation of disease and insect pest led to lowered quality of agricultural products. How to address severe competition in the market where low costs are dominant is a challenge for farmers in a typical dry field farming area. This sense of impending crisis has urged farmers to challenge themselves to the problem by using livestock excreta and composting, with the slogan “The most important thing in agriculture is to improve soil fertility.”

1. Development Process of the Region and Regional Industry

“The most important thing in agriculture is to improve soil fertility.” These are the words of by Kiyoshi Kawai, the present mayor of Koshimizu.

Koshimizu pursued large-scale agriculture – scale merits – and realized greatly improved production of field crops. On the other hand, the town could not avoid lowering soil fertility because of application of chemical fertilizers and agricultural chemicals and decrease in the number of livestock. In addition, the establishment of large-scale field operation realized through agricultural modernization met with severe conditions because of changes in the field crop market.

However, as will be stated later, the municipal government and JA Koshimizu have been cooperating in making soil in recent years for the purpose of improving soil fertility with the slogan “The most important thing in agriculture is to improve soil fertility.” Koshimizu aims to establish a new production center of vegetables.

(1) Characteristics of the region and establishment of large-scale operation

Located in the eastern part of Abashiri Subprefecture on the Sea of Okhotsk in northeastern Hokkaido, Koshimizu is a key place for linking the Hokumo (Kitami-Abashiri) area and the Kushiro area (eastern Hokkaido) in the road network consisting mainly of national routes. Tourist spots in the town include Koshimizu Gensei Kaen (wild flower garden)/Abashiri Quasi-National Park colored by approximately 40 kinds of flowers in early summer, and Lake Tofutsu to which Whooper Swans fly in early winter and early spring, both of which are frequently visited by tourists who use Memambetsu Airport near Koshimizu, 30 km west of the town. The landform is in the shape of a rectangle stretching from north to south, with gentle slopes from the southern mountain area (Kitami mountain range) to the shore of the Sea of Okhotsk in the north. Owing to such geographic features, the climate has two aspects: the subarctic rainy climate similar to the inland climate which features hot and short summer and the Sea of Okhotsk climate, which is influenced by currents, sea fog and floating ice on the sea.

In 1879, the administrative districts of four villages, as well as Shari Village in Shari-gun, were established, and Koshimizu came into existence through separation from the old Shari Village after the establishment of the second-grade municipality system began in 1919. In 1953, Koshimizu was organized as a town.

Farms, including stock farms, began development one after another in the 1900s, and cultivation was newly conducted even after World War II. The number of farmers was 3,787 in 1955, accounting for 70% of the workforce, showing that the town had developed as a complete farming village whose key industry was agriculture.

After the population stood at 11,706 in 1962, it continued to decrease. The reason for this was that the young workforce and people who abandoned farming moved to large cities. The exodus rapidly accelerated because incomes of people living in large cities increased during the high economic growth period, and because agricultural modernization was advancing, based on the Agricultural Basic Law, which was enacted in 1961. In that process, workforces by industry changed gradually: the workforce in the primary industry accounted for 38.7%, the secondary industry for 16.9%, and the tertiary industry for 44.3%, in 1995.

Under this situation where the regional structure changed, scales of cultivated land under management in

the town was enlarged although the total number of farming households decreased sharply. (See Fig. 1-1 for details.)

Mechanization of agricultural work from seeding and seedling to harvesting using combines and harvesters was encouraged by policies, including a project for an agricultural structure improvement project and a land improvement project. Moreover, to reallocate land utilization for large-scale reclamation to deal with the mechanization, an exchange and consolidation project was intensively conducted until the early 1980s. Thus, the modernization of agriculture in the town was advanced.

As a result, Koshimizu realized large-scale agriculture; the mean area of cultivated land under management operated by a farming household is 22 ha at present.

Fig. 1-1 Changes in cultivated land under management in Koshimizu (1960 -- 1999)

	Unit: household(s)				
	1960	1970	1980	1990	1999
Escape clause	-	1	5	5	4
Less than 1 ha	102	34	32	11	14
1 - 3 ha	48	32	13	9	4
3 - 5 ha	205	60	22	9	3
5 - 7.5 ha	341	132	32	8	3
7.5 - 10 ha	249	173	61	17	10
10 - 15 ha	146	228	159	106	51
15 - 20 ha	16	78	169	126	85
20 ha or more	1	28	100	211	230
Total number of farming households	1108	766	593	502	424

Source: Prepared from "Agricultural Census" of each year by the Ministry of Agriculture, Forestry and Fisheries and "1999 Agricultural Basic Survey"

Note 1: Excluding self-supply farmers

Note 2: Shaded figures represent modes.

(2) The agriculture crisis in Koshimizu and efforts to deal with it

The total area of arable land in Koshimizu is 10,600 ha, and approximately 80% of it is volcanic ash soil which drains well, making the town suitable for dry field farming. Although rice growing was conducted concurrently in the past, marginal rice growing disappeared from the town due to damage from cold weather. Instead, land-extensive farming developed with potatoes, wheat and sugar beets as key crops, greatly improving production through the agricultural modernization.

In the process of agricultural modernization, however, soil fertility could not be maintained well as agriculture depended heavily on mass application of chemical fertilizers. Damage to soil, diseases and insect pests mainly caused by lowered soil fertility with insufficient organic material occurred frequently and lowered quality of agricultural products: "potato scab," "eyespot disease," "sugar beet root rot" and "vegetable nematode root rot."

Moreover, after the peak in 1983, the administration froze the prices of field crops, and they were lowered for six consecutive years from 1988. Such severe market conditions provoked unrest for agricultural operation among producers and agriculture-related organizations.

To cope with the situation, the municipal government and JA Koshimizu tried to establish a vegetable producing center and make high-quality soil, which is a precondition for the stable supply of abundant and high-quality vegetables to the market. Figure 1-2 shows projects subsidized by the town after the 1990s. Koshimizu's agricultural policy came to emphasize subsidizing the establishment of facilities and machinery to introduce vegetables to dry field farming and the installation of facilities for "Yusui (liquid manure)," which was introduced by the municipal government for the improvement of soil fertility.

As a result of such efforts by the municipal government and JA Koshimizu, burdock has gained high market appraisal as "Koshimizu Gobo" and is shipped to the Kansai region. In addition, cultivated areas for

onions have been increased year after year for the purpose of establishment of a brand and a stable supply.

Fig. 1-2 Records of assistant projects for important facilities and machinery conducted in Koshimizu

Year	Classification:	Details:	Conducted by:	Expenses (unit: thousand)
1988	Machinery	Tanpi blenders (2)	JA	4,540
	Machinery	Trenchers (3) Diggers (6) Ridging machine (1)	JA	6,243
	Facility	Establishment of facility for irrigation (in one place)	Utility Cooperative	3,320
1989	Machinery	Trenchers (17) Diggers (17)	JA	26,560
	Facility	Facility for precooling vegetables (1)	JA	50,230
1990	Machinery	Tanpi blenders (2)	JA	4,700
1991	Facility	Tank for car washing facility (1)	JA	
	Machinery	Soil sterilizing machines (2)	JA	1,740
	Machinery	Carrot seeders (4)	JA	2,109
	Facility	Facility for drying soybeans	JA	30,334
1992	Machinery	Accessory machines for soil sterilizing (6)	JA	396
	Machinery	Carrot seeders (4)	JA	2,430
	Machinery	Soybean combine (1)	Utility Cooperative	4,607
1993	Machinery	High-pressure hot-water washing machine (1)	JA	614
	Machinery	Carrot seeders (4)	JA	2,116
1994	Facility	Facility to make starch liquid wastes into liquid manure	JA	68,000
	Facility	Facility to dehydrate starch byproducts	JA	73,624
1995	Facility	Facility to utilize "Yusur" for multi purposes	JA	7,668
	Facility	Facility to wash and grade carrots (e.g., machines)	JA	133,900
	Machinery	Carrot harvesters (12)	Carrot Section	33,990
1996	Machinery	Manure spreaders (26)	JA	33,475
	Machinery	Potato harvesters (seed harvesting; 3)	JA	9,765
1997	Machinery	Manure spreaders (16)	JA	26,006
	Machinery	Soybean combines (2)	Utility Cooperative	32,769
	Machinery	Soybean combine (1)	JA	12,360
	Machinery	Onion transplanters (3)	JA	14,175
	Facility	Soybean cleaner	JA	3,780
1998	Facility	Car-washing station for cars for "Yusur" facilities and wastewater treatment facility	JA	13,745
	Machinery	Onion transplanters (3)	JA	14,175
	Machinery	Onion harvesters (4)		18,900
	Machinery	Onion pickers (4)	Onion Section	9,240
	Facility	Potato harvesters (for fresh market variety; 2) Facility to dry, adjust and preserve wheat	Potato Section JA	11,655 1,995,000
1999	Machinery	Potato harvesters (for fresh market variety; 2)	Potato Section	11,655
	Machinery	Combine for various purposes (1)	Soybean Production Section	16,438
	Facility	Fences to prevent deer from invading	JA	42,803
2000	Machinery	Sugar beet transplanter (automatic; 1)	Utility Cooperative	5,124
	Facility	Fences to prevent deer from invading	JA	88,935

Source: Data from Koshimizu Municipal Office

Note: Shaded figures represent the numbers of machines and facilities soil fertility improvement.

2. Development of regional industries and the local government / JA

As stated above, Koshimizu considered it important to recover weakened soil fertility. This was intended not only to establish itself a production center for vegetables, but also to establish a long-term rotation system mainly of crops controlled by the government and soybeans and vegetables as additional ones. For this purpose, "Koshimizu Soil Fertility Improvement Promotion Council" was established as an organization to actively facilitate the improvement of soil fertility.

(1) Establishment of "Koshimizu Soil Fertility Improvement Promotion Council" and its activities

The municipal government and JA Koshimizu established "Koshimizu Soil Fertility Improvement Promotion Council" as the core of an organizational system for improving soil fertility in 1978. The organization aimed to seek ideal policies for regional agriculture with the improvement of soil fertility as its focus, establish farm management based on soil productivity, conduct independent research and discussions and boost producers' morale for the voluntary improvement of soil fertility.

It was confirmed through the council that no soil disease or insect pest outbreak was observed in the agricultural land of producers in the town who had improved soil fertility using compost instead of chemical fertilizers. Moreover, many producers in the town understood that agricultural production should be reviewed, with the improvement of soil fertility as a starting point, to prevent degradation of products. Based on such research and discussions, a desire to use livestock excreta grew as a way to make up for the deficiency of soil organic material.

A method employed to process livestock excreta into compost was "Yusui," which was invented by Mamoru Uchimizu, Doctor of Science, based on a "method to process wastewater containing organic material." It is an odorless liquid manure made by generating soil fungi in livestock excreta and decomposing it through the working of aerobic and anaerobic bacteria. A dairy farmer who was in touch with Uchimizu, president of the Natural Philosophy Association, first introduced "Yusui" to agricultural operations. Since then "Yusui" has been popular among dairy farmers having difficulty disposing of livestock excreta.

It was possible to use not only livestock excreta but also "decanter wastewater" (starch liquid wastes) generated from the starch production process, as material for "Yusui." For this reason, the municipal government and JA Koshimizu, which placed an emphasis on production and processing of potatoes as a key crop, paid attention to the effects of "Yusui" earlier on.

Being expected to understand the effects of "Yusui" urgently, the Council collected data on conditions after spreading "Yusui" and conducted tests on livestock excreta compost through the use of the liquid manure. The Council classified the effects of "Yusui" into the following six advantages.

- 1) Offensive odors of livestock excreta and starch liquid wastes were eliminated.
- 2) Putrefactive bacteria serve as active bacteria, which suppress generation of flies.
- 3) Spreading "Yusui" on immature compost greatly promotes fermentation and drastically shortens the maturing period of compost.
- 4) Even spreading "Yusui" directly on crops does not damage their roots and makes it possible to use livestock urine throughout the year, which could previously only be used after harvesting crops in summer.
- 5) "Yusui" promotes decomposition of field byproducts, including straw, and makes them into compost easily.
- 6) Dairy farmers can add "Yusui" to cattle feed to use it as high-quality roughage.

The raising of common awareness "agricultural production with soil fertility improvement as its starting point" and discovery of the effects of "Yusui" by Koshimizu Soil Fertility Improvement Promotion Council were essential factors in changing agriculture in Koshimizu into "clean" and recycle-oriented agriculture.

It can be said that the clear effects of "Yusui" developed agricultural producers' common awareness. They actively introduced facilities for "Yusui," and it was easier for the municipal government and JA Koshimizu to provide farmers who operate their farms individually with support for introduction of facilities for "Yusui."

However, it was not easy to develop common awareness of the importance of soil fertility improvement, taking quite a long time, approximately 10 years.

(2) Development of measures to support soil fertility improvement conducted by Koshimizu Municipal Government and JA Koshimizu

Figure 2-1 shows the number of installed facilities for "Yusui." As stated above, seven dairy farming

households installed such facilities to dispose of livestock excreta by fiscal 1992. Learning from the examples of the farmers who took a leading part in addressing "Yusui," the municipal government established facilities for "Yusui" in a municipal stock farm (commissioned to JA Koshimizu for its management) in fiscal 1992. Since fiscal 1993, the municipal government and JA Koshimizu has considered Yusui important as a measure to improve soil fertility in the town, subsidizing part of the expenses required to establish facilities for "Yusui" to farmers who operate their farms individually. (See Fig. 2-2 for details.)

Fig. 2-1 The number of farm household with facilities for "Yusui" by management form (as of the end of March, fiscal 2000)

(unit: farming households)					
Fiscal year	Dairy farming	Hog farming	Beef cattle farming	Dry field farming	Sum total
By 1992	7				7
1993	5 (5)		1 (1)	4 (3)	10 (9)
1994		1 (1)		10 (10)	11 (11)
1995		1 (1)		10 (10)	11 (11)
1996	3 (3)			6 (6)	9 (9)
1997	3 (3)			7 (7)	10 (10)
Sum total	13 (11)	2 (2)	1 (1)	37 (36)	53 (50)

Source: Data from Koshimizu Municipal Office

Note 1: The figures in parentheses are the numbers of farmers who were subsidized by the municipal government/JA, and are included in the number before them. The subsidization was concluded in fiscal 1997.

Note 2: Two dairy farming households in fiscal 1996 and three in fiscal 1997, five in total, overlap with the numbers in fiscal 1992, which cause the discrepancy in the total number of dairy farming (13) and the sum total (53).

Fig. 2-2 Subsidy system for farmers to establish facilities for "Yusui"

Fiscal year	Farming households subsidized	Subsidizing rate:	Total amounts subsidized by the town (unit: thousand)	Explanatory remarks:
1993	9	Municipal Government: 1/6 JA: 1/6 Farming households (rate of own expense): 4/6	1,091	Subsidy limits Diary farming households etc.: ¥924,000 Dry field farming households: ¥400,000
1994	11		821	
1995	11	Fixed rate (the municipal government + JA) Dairy farming households: ¥200,000 Dry field farming households: ¥100,000	650	Since the scale of dairy farming is larger, the amount of subsidy was set at ¥200,000. Average amount spent by farming household: approximately ¥20,000 to ¥50,000.
1996	9		600	
1997	10		650	
Total	50		3,812	

Source: Data from Koshimizu Municipal Office

Note: The subsidy system was terminated in fiscal 1997.

Moreover, efforts to use starch liquid wastes as material for "Yusui" were made. In 1994, the municipal government and JA Koshimizu established a facility to make liquid manure from starch liquid wastes in a starch factory.

In this way, starch liquid wastes discharged from factories were sent to the facility to make liquid manure through pipelines, gaining renewed value as "Yusui." Yusui made from starch liquid wastes are spread on approximately 2,000 ha of agricultural land in the town after harvesting wheat or before plowing in green manure. Eight sprinkler trucks (slurry lorries) owned by JA Koshimizu spread the liquid manure over the fields (3 to 4 tons per 10 are). For burden charges of sprinkling, producers who use the field to be sprinkled pay ¥600 per 10 ares and are subsidized ¥100 per ton (municipal government: ¥50; JA: ¥50). This allows farmers to continue to make their field sprinkled with "Yusui".

As mentioned above, through financial aid given by the municipal government and JA Koshimizu, "Yusui" was popularized. However, it should be specially mentioned here that since the material is livestock excreta, Yusui must be used only within the town.

In order to prevent livestock epidemics and other problems from occurring, the municipal government and JA Koshimizu do not distribute "Yusui" outside the town.

For this reason, it is a principle that "Yusui" made from starch liquid wastes should be spread on the fields of farmers who plant potatoes, from which liquid waste is produced, so that all produced "Yusui" can be completely used.

We should not decide prematurely that such limitations on the use of "Yusui" (it should be used only within the town) is a disadvantage, because the "disadvantage" promoted "Yusui" to be used not only by farmers but also by general citizens. At present, citizens use "Yusui" to make compost from garbage to apply it on kitchen gardens, which is another effort to use all produced "Yusui." To make this effort, the municipal government and JA Koshimizu established a facility (storage tank with the capacity of 30 tons) to use "Yusui" for various purposes in fiscal 1995. Citizens using Yusui can obtain a maximum of 20 liters per person by visiting the facility from 2:00 to 6:00 p.m. on Thursdays from June to September every year.

In this way, the use of livestock excreta and starch liquid wastes as the liquid manure "Yusui" through support by the municipal government and JA Koshimizu allowed the development of "clean" and recycle-oriented agriculture involving not only farmers but also general citizens.

(3) Appearance of vegetables cultivated through the use of "Yusui" and holding of the Yusui Saibai Festival

Information about the recycle-oriented agriculture realized by concerted efforts of townspeople, as mentioned above, is provided for places outside the town. Posters, pamphlets and videos are prepared for places outside the town by the Koshimizu Soil Fertility Improvement Promotion Council to offer such information.

In addition to provision of information, the Council registered a trademark of "Yusui-grown vegetables" in 1996 to give them a brand name. After that, the Council prepared guides and stickers to publicize "Yusui-grown vegetables," aiming to increase value-added agricultural products in Koshimizu.

On the other hand, the municipal government and JA Koshimizu cooperate with the patentee in preventing unregulated proliferation of "Yusui" in order to protect the originality of "Yusui" technology.

As indicated earlier, "Yusui-grown vegetables" are cultivated while maintaining the identity of the town. Their sales prices are a little higher than general agricultural products, although agricultural incomes have not been improved because of higher costs. Therefore, further reduction of costs to improve profit ratios is a challenge for the future.

The main distribution channel for "Yusui-grown vegetables" is consumers' cooperatives. To increase agricultural incomes, it is essential to extend the market. For this purpose, farmers in the town are playing a leading role in taking measures: women engaged in growing vegetables with Yusui when harvesting conduct on-the-spot sales regularly.

Moreover, as an event to publicize "Yusui" nationwide, the Yusui Saibai Festival was held in 1996 for the first time. In the festival, sales of "Yusui-grown rice" produced in Imadate Town, Fukui Prefecture, which is related to Koshimizu through Yusui, and "Yusui-grown vegetables" produced in the town were conducted, and a talk on Yusui was held outdoors. Thus, the whole town has been making efforts to establish the brand of "Yusui-grown vegetables," although there are many challenges because the sales of the vegetables outside the town have just started.

Technological advice on "Yusui" has been given not only in the town, but also to approximately 150 farming households and agricultural organizations in other parts of Hokkaido, and consumers' cooperatives, contractor farmers and other related organizations in other prefectures. To establish the identity of "Yusui" and give impressions that it belongs to farmers in Koshimizu, arrangements have been made to ensure that every farmer who has given samples used for giving technological advice outside Koshimizu can be identified. A portion of fees for technological advice is passed on to the farmers.

"Yusui-grown vegetables" have allowed the recycle-oriented agriculture in Koshimizu to develop, contributing to building up an attractive image for the local agriculture. It can be said that the "horizontal development" of the results to other regions is the very evidence that achievements attained through local activities have been received widely.

3. Factors and results of "town revitalization with soil improvement as its starting point"

(1) Factors of "town revitalization with soil improvement as its starting point"

Koshimizu has grown based on agriculture since the pioneer cultivation, and it is not true that they have not tried to maintain soil fertility. For example, production of sugar beets, which are now a key crop in the agriculture in Koshimizu, was recommended as a measure to maintain soil fertility, and to establish a rotation and promote agriculture in a cold region to be linked with stock-holding agriculture. The crop is a value-added product as material for composting, not to mention as material for sugar. Thus, the town has never neglected soil fertility when establishing a rotation.

Although we are in the age when agricultural markets are required to provide a stable amount of high-quality products, damage to soil probably caused by weakened soil fertility and disease and insect pest outbreaks have lowered the quality of agricultural products, leading to the reconfirmation of the importance of soil improvement. With this sense of crisis regarding weakened soil fertility, farmers started improving soil with active support from the municipal government and JA Koshimizu with the slogan "The most important thing in agriculture is to improve soil fertility," said by Kiyoshi Kawai, the present mayor of Koshimizu.

Now, what made "The most important thing in agriculture is to improve soil fertility" the key concept for town revitalization?

One factor is that the municipal government and JA Koshimizu regarded the improvement of soil fertility not as a problem of individual farm management but also as a challenge for the town. The popularization process of Yusui through the efforts by the municipal government and JA Koshimizu is outlined as follows.

- 1) Establishment of Koshimizu Soil Fertility Improvement Promotion Council
- 2) Confirmation of the importance of soil improvement and discovery of "Yusui" effects
- 3) Establishment of facilities for "Yusui" in a municipal stock farm
- 4) Subsidizing expenses required to build "Yusui" facilities to farmers who operate individually
- 5) Introduction of "Yusui" facilities to treat starch liquid wastes
- 6) Establishment of "Yusui" facilities for citizens' benefits

The popularization process indicates that countermeasures were taken to dispose of livestock excreta and starch liquid wastes, a problem for both farmers and townspeople, through the promotion and support of "Yusui" technology, resulting in soil improvement involving townspeople and economic development of the town.

The other factor is the naming of "Yusui," the liquid manure which allowed Koshimizu to improve soil fertility in a unique way.

"Yusui" was named after Dr. Uchimizu. Thirteen years ago, he was invited by Shin Takeda, the head of a livestock clinic, and seven dairy farmers, to their study meeting. A processing solvent which employed a self-purification method using soil bacteria nearly came into existence at that time as the fruit of the study group's efforts. They named the processing solvent as a patent name after the first letter of the last name ("u") of Dr. Uchimizu, who had only a short time to live, as a tribute to his achievement. The name of the liquid manure "Yusui" also coincides with the origin of the town's name, which comes from the name of the "ekitei" (roadside station with accommodations offering postal and transportation services also) established in the town in 1891. The station was named Koshimizu (little clear spring water) because springwater ("yusui" in Japanese) near the Ponyanbetsu River along the road was praised as very clear drinking water. The coincidence (Yusui also means springwater in Japanese) is another reason for the popularity of Yusui. Giving such a friendly name to it reduced citizens' detestation for livestock excreta and starch liquid wastes caused by their bad smell, and made it easy to make citizens understand that "Yusui" is a key word for town revitalization.

(2) Results of "town revitalization with soil improvement as its starting point"

Soil improvement has brought grand results to Koshimizu.

The first result is that soil fertility has been improved, which was also the original objective. In these years, the amount of crops harvested has been larger than the amount on average in Hokkaido, with stable soil

fertility maintained. For Koshimizu, which is an entirely farming town located in Hokkaido, one of the most important food production centers in Japan, maintaining and increasing crop yields is a precondition for survival. Moreover, addressing fundamental problems in agricultural production and succeeding in resolving them must have given confidence and pride to agricultural producers, who worried about their management survival.

The second result is that farmers were given new opportunities to challenge themselves in making value-added products by growing vegetables using "Yusui," instead of only trying to ensure the amount of products harvested. It can be said that farmers in Koshimizu have gained an advantage in competition among production centers in the circumstances where even producing processes are indicators of values in the market with a surplus of agricultural produce.

The third result is from the treatment of livestock excreta and starch liquid wastes using "Yusui." These days, problems in dealing with livestock excreta and industrial waste confront people particularly in advanced countries. Preventing such problems in advance while leading to a new agriculture – recycle-oriented agriculture – involving not only agricultural producers but also general citizens through "Yusui" is a grand result.

The fourth result is to find the possibility of regional economic development through "recycling." Soil improvement in Koshimizu features material recycling in which products in the town are used there through "Yusui."

This idea of recycling is also used in supporting a shopping center in the town; a portion of profits gained by stores in the shopping center passed on to citizens who use the center, through "Koshimizu Fureai Stamps," coupon stamps which can be used anywhere in the center.

From the concept of recycling in the town through soil improvement, Koshimizu has been revitalizing itself.

Shimokawa Town

Charcoal production boosted by forest damage

Embraced by forests, Shimokawa is a town of wood. The main products of the past, construction materials, however, were threatened by imported lumber, and the municipal government and forest owners' associations were seeking countermeasures. In such a situation, wet snow greatly damaged forests of Japanese larch trees, and an idea occurred to deal with the damaged forests: production and sales of charcoal.

The town aims to revitalize itself by developing human resources and forming a recycling-oriented society.

Shimokawa is attracting the attention of people in Hokkaido and all other parts of Japan. It is because there are energetic local activities by citizens in this town in spite of rapidly advancing depopulation and aging. In particular, community development utilizing local resources and activities conducted by Industrial Cluster Study Society are quite distinct from other activities elsewhere in Hokkaido.

Shimokawa Forest Owners' Association plays a leading part in these activities. Here are research findings on why such activities started and have been developing in the area where life is not easy, and why the activities center on the forest owners' association.

1. Overview of Shimokawa

(1) Local characteristics

Shimokawa is located in the northern part of Kamikawa Subprefecture in Hokkaido (north latitude: 44° 18'; east longitude: 142° 38'). With a total area of 644 km², the town stretches rectangularly 21 km from east to west and 31 km from north to south.

In the middle of the town, the Nayoro River, a tributary of the Teshio River, runs slowly toward the west. The whole basin consists of a small area of flat land and continuous gentle hills. On the other hand, the Sanru area to the north, the Ichinohashi area to the east and the Okunayoro area to the south are steep mountainous areas. Mountains and forests account for 92% of the total area, making the town a mountainous region.

With severe weather conditions, the town is a cold, snowy region. The annual differences between high and low temperatures are great, with 30°C in the summer and occasionally -30°C or lower in the winter. The snow period is from late October to late April, and the annual mean snowfall is approximately 1 m, which makes the town an area with relatively less snow in Kamikawa Subprefecture.

The climate of the town is closer to the Mombetsu area rather than to the northern Kamikawa area in weather reports, owing to the influence of the Sea of Okhotsk. Forests are basically northern-type mixed forests of needle-leaved trees, including Sakhalin spruce and firs, and broad-leaved trees, including white oaks, Japanese lindens and Japanese elms.

Full-scale cultivation in Shimokawa started in the 1900s. At that time, the Shimokawa area belonged to the present City of Nayoro (Village of Kaminayoro at that time). Separating from Kaminayoro, the area became independent as the Village of Shimokawa in 1924 (reorganized as a city in 1924).

Industries of the town centered on agriculture, forestry and manufacturing. In and after the late 1960s, the industrial structure changed remarkably. In 1965, the number of workers 15 years of age or older in key industries was 1,792 (28.6%) in agriculture, 733 (11.7%) in forestry, and 838 (13.4%) in mining, showing the importance of these three industries. The proportions of workers 15 years of age or older in key industries in 1975, however, were 732 (17.3%) in agriculture, 394 (9.3%) in forestry, and 598 (14.1%) in mining; the number in 1995 was 469 (18.8%) in agriculture, 109 (4.4%) in forestry, and 4 (0.2%) in mining. Thus, the number of workers in mining decreased greatly. Due to the reduction in the operational scale of the copper mine in the town following the influence of copper trade liberalization (1963), the mine became a non-operational mine (1983), which means it practically closed.

Accordingly, the population of the town, which stood at 15,555 in 1960, fell to less than 10,000 in 1975.

As of 2000, it decreased to one third of its peak population. According to the 2000 national census, the population of Shimokawa was 4,413, or 334 less than that of five years ago. In addition to depopulation, aging is also advancing. The aging rate, which refers to the percentage of people at the age of 65 or older in the local population, was 24.8% in Shimokawa in 1995, slightly higher than those of neighboring municipalities.

Abolishment of a train line (Nayoro Main Line) in 1989 has also had effects on the depopulation of Shimokawa. Transportation for citizens consists mainly of buses and their own cars. When it is necessary to go to Nayoro (approx. 20 min. by car) or Asahikawa (approx. 2 hr. by car) to buy things other than daily necessities which are available at stores in the town, the elderly in particular must feel inconvenience.

(2) Initial stage of community improvement leading to the development of specialties

As was mentioned above, Shimokawa suffers from drastic depopulation. Then, what measures against an exodus were considered? One countermeasure was to attract enterprises and implement large-scale public works. The countermeasures included construction of test courses by Suzuki Motor Corporation (starting in 1986). However, it is difficult to expect and depend on only "imported" development, such as attraction of enterprises, because Shimokawa does not have favorable geographic conditions. In addition, since attraction of enterprises is greatly influenced by business conditions, enterprises may withdraw suddenly. For large-scale public works, the plan to construct the Sanru Dam is now under way in order to control flooding of the Sanru River, a tributary of the Nayoro.

On the other hand, dependence on public works is expected only to increase temporary demand for civil engineering and construction, not leading to sustainable growth. Sustainable local development requires making the most of local resources for community improvement. Accordingly, Shimokawa has long directed its attention to forest resources and forestry as a key industry.

Although the forestry workforce has decreased even greater than the agriculture workforce, forestry output exceeds agricultural output when forestry-related industries in the town are included. While the agricultural workforce in 1995 was 469 with gross agricultural output of approximately ¥2.1 billion (1997), the shipment value of lumber and wood product manufacturing was approximately ¥4.3 billion (1997 workforce: 221), exceeding the shipment value of agriculture. The figures show the results gained from producing raw wood and manufacturing products with value added in the town. Forestry operations and wood processing and manufacturing are the key industries in Shimokawa.

(3) Forest policy in Shimokawa

Forestry is more restricted by growing periods of products than agriculture. The cutting cycle begins after several decades. The industry requires quite a long time, from capital investments to paybacks. Accordingly, forest development needs to have consistency and continuity with long-term prospects. Recognizing the characteristics of forest development, the municipal government began forest management at an early stage of municipal development.

After the town system was established, Koshimizu purchased a national forest (approx. 1,200 ha) from the central government under the National Forest Consolidation Provisional Measures Law in March 1953. In order to conduct afforestation independently, the town needed to purchase a national forest. With the purchase as its starting point, the municipal government was planning to operate and manage municipal forests. However, Typhoon No. 15 in the following year, 1954, knocked down many trees, damaging up to one third of the national forest and half of the municipal forests.

After suffering from the damage, the municipal government aimed to take measures for new management of forests. They included disposal of trees brought down or damaged by the wind and early payment for the national forest by felling. In 1962, payment was completed.

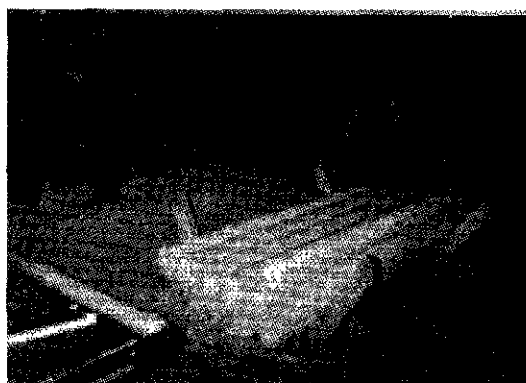
Another measure was systematic afforestation. The town created a system for systematic afforestation of 40 to 50 ha per year, that is, a "cyclical system (Harada System) which allows for repetitive felling and planting" (Takehiko Hobo, *Spontaneous Development Theory and Farming Villages in Japan*: Iwanami Shoten, 1996), a sustainable utilization system of local resources. Mr. Harada became a member of the

municipal government in charge of forestry administration when the town purchased the national forest in 1953, and served as the Mayor of Shimokawa from 1983 to 1999. This project conducted by a member of the municipal government came to serve as a great strategy for community improvement.

After the purchase of a national forest, the municipal forests continued to be planted with a method for afforestation operated directly by the town. In 1967, work, including forestry labor management, was entirely commissioned to the forest owners' association, with the purpose of establishing a place for employment in the association and stabilizing the operation of the association. The forest owners' association is a cooperative established to conduct joint projects for forest management for those who are owners of forests and members of the association. Main projects include giving advice for forest management and conducting commissioned forest management (*Encyclopedia of Cooperative Associations*, new ed., Ie-no-Hikari Association, 1986, p.491). The relationships between the forest owners' association and the municipal government are not limited to afforestation projects. When examining changes in the administrative organization in Shimokawa, it is found that the forestry administration section was established in 1967, when the mayor also assumed the position as president of the forest owners' association, and the manager of forestry administration section (Mr. Harada, who later served as mayor) held the position of councilor of the association. In 1971, the forestry administration section was merged into the agriculture and forestry section. In 1996, the section was separated again into the agricultural affairs section and the forestry affairs section. These actions indicate that the organizational system had been changing according to conditions of local resources, including those of agriculture and forestry, as well as conditions of their markets.

Now let us look at forestry structure improvement projects to learn more about relationships between the municipal government and the forest owners' association. Starting in 1967, the first forestry structure improvement project was conducted with subsidies of 70% of the expenses provided by the national and prefectural governments. The project included expansion of municipal forest areas through liquidization of forestry land, widening of forestry roads and introduction of new facilities. Moreover, a supplementary forestry structure improvement project started in 1972, and the second project started in 1976. After that, the new forestry structure improvement project, the forestry structure revitalization project and the forestry structure improvement project for establishment of lumber supply areas were conducted in 1983, 1992 and 1997 respectively.

Most of these projects, except for excavation for forest roads, were conducted by the forest owners' association. Shimokawa is the only municipality that has conducted such a large number of forestry structure improvement projects.



Logs for charcoal production

Fig. 1-1 Changes in the areas of forests

(ha; %)

Year	Total area	National forests		Municipal forests		Private and communal forests	
		Area	Percentage	Area	Percentage	Area	Percentage
1968	56,546	50,847	89.9	1,537	2.7	4,162	7.4
1975	56,795	50,882	89.4	1,537	2.6	4,376	8.0
1980	57,706	50,891	88.2	1,732	3.0	5,083	8.8
1984	57,689	50,881	88.2	1,757	3.0	5,051	8.8
1990	57,302	50,524	88.2	2,188	3.8	4,590	8.0
1995	57,464	50,006	87.0	2,911	5.1	4,547	7.9

Note: prepared from "Outlines of Demographic, Social and Economic Conditions in Municipalities"

Figure. 1.1 indicates that the municipal government and the forest owners' association cooperated closely in promoting ownership of municipal forests and developing seedbeds, afforestation and forest management.

As of 1998, Shimokawa owned approximately 3,000 ha of municipal forests. The town continued to increase the area of municipal forests in order to stabilize the forest development cycle from tree planting to felling. In this way, the town was endeavoring to create a place for stable employment while making use of local resources, forests. However, the prices of felled wood stagnated for a long time under the influence of imported wood, which forced the town to take some countermeasures. The measure taken was to manufacture and sell value-added products. Since Shimokawa has many local wood-related industries, including chip mills, sawmills and plywood factories, the town also had to develop new products to avoid competing with these industries. It was charcoal products that met the need. An incident which occurred in 1981 also forced the town to develop charcoal products.

2. Development of the local industry, and the municipal government and citizens' organizations

(1) Details of the development of charcoal processing products

The incident refers to the damage of Japanese larch tree forests caused by wet snow. With the damaged area of 1,067 ha, of which 496 ha of forests was actually damaged, Shimokawa suffered damages of ¥350 million in total. Moreover, if the damaged forests had been left without any countermeasures, a second disaster, such as disease and insect damage, would have occurred. In dealing with these problems with the damaged forests, Shimokawa decided to manufacture and sell charcoal. In fact, a decision was made at that time to implement the new forestry structure improvement project in the town. This subsidized project aimed mainly to construct facilities for producing charcoal, wood vinegar and carbon, as a measure for lumber from thinning.

Since Japanese larch lumber was produced as construction material as in other regions, producing charcoal from Japanese larch trees was a new project which the town had not experienced.

However, production of charcoal from Japanese larch trees was the only choice when seeking a processing project which would not clash with other local industries while trying to make the use of local resources as a general rule. In the general assembly of the forest owners' association at that time, questions such as "is production of charcoal from Japanese larch trees really profitable, is it possible to return profits to owners of forests and who accepts the responsibility if losses occur" arose. The president of the forest owners' association, however, suggested that they begin with test operations and expand the scale if there was a possibility, and that only by trying they would be able to see any results. And this suggestion led to the implementation.

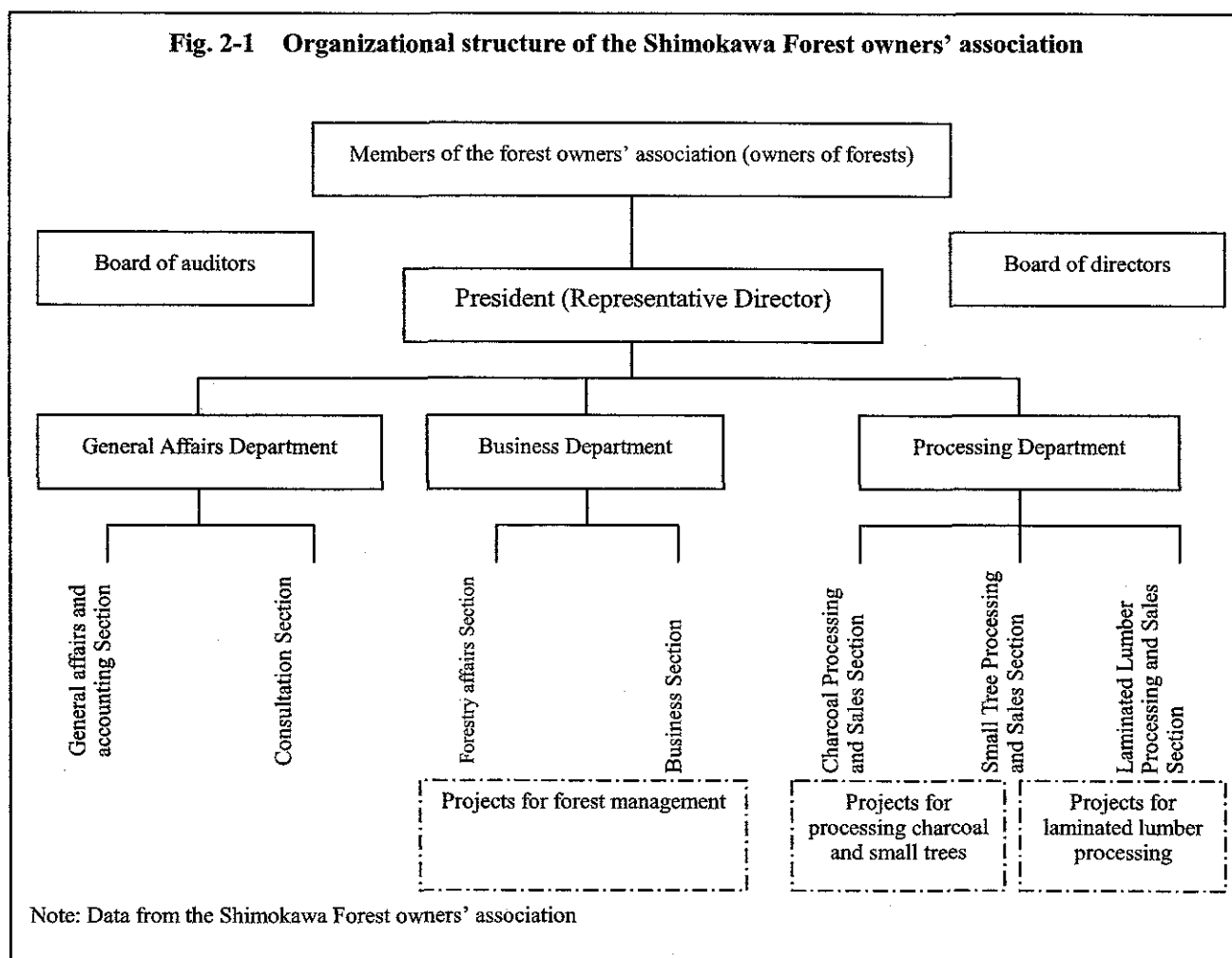
The forestry structure improvement project at that time was conducted from 1983 to 1989. In fiscal 1984, two charcoal making kilns were installed with the establishment of a charcoal-making factory, and two additional kilns were installed in 1988.

The subsidized project conducted in 1990 was named the model project for promoting formation of a local lumber producing center and was subsidized mainly for constructing facilities for laminated lumber processing.

Receiving subsidies for various purposes, the town realized commercialization of charcoal and many kinds of wood processing products.

(2) Business details of the forest owners' association

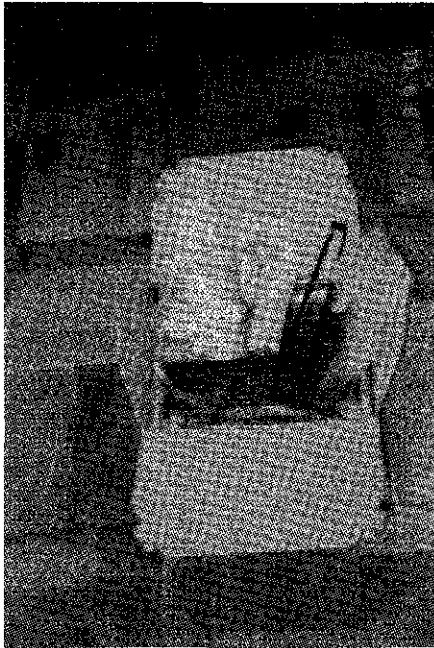
As of 1999, the number of the association members was 362, and had remained at the same level for the past ten years. Figure 2-1 shows the organizational structure of the association. The association consists of the Business Department, which conducts projects for forest management, the Processing Department, which conducts projects for processing charcoal and small trees and laminated lumber processing, and the general affairs department. While projects for forest management include afforestation, silviculture and nursery, which are conducted in other forest owners' association, projects for processing charcoal and small trees are unique to this association.



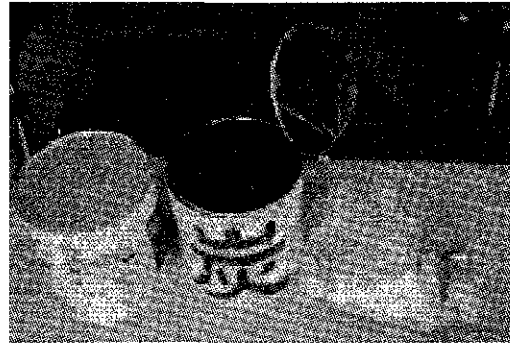
As Fig. 2-1 shows, in projects for processing charcoal and small trees, many kinds of products have been developed: “Shimokawa Mokutan (charcoal)” used as fuel, “Karamatsu Tanso (Japanese larch carbon)” also used for purifying water, charcoal ash for improving agricultural soil and promoting snow-melting, “Furusato Konro (cooking stove) for recreational activities, and “Tan (charcoal) CAN.”

Several sizes of charcoal packages from 1 kg to 10 kg are available, and charcoal can be used in many situations, including cooking and bathing. In particular, charcoal for humidity control under floors has been attracting public attention recently. It is charcoal powder in a 45-cm² bag. Laying approximately 16 bags under a floor of 1 *tsubo* (Japanese measurement of area equal to 3.306 m²) when constructing a house will serve as a measure against sick house syndrome, a current problem.

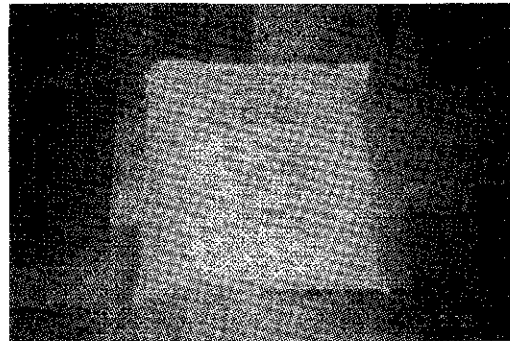
Product development is entailed by hardships. For example, officials of the forest owners' association found difficulty when trying to sell “Shimokawa Mokutan (charcoal)” to supermarkets and restaurants in order



Contents of Furusato Konro



Tan CAN



Charcoal for humidity control under floors

to extend the market because charcoal made from Japanese larch trees had a bad reputation. An official who noticed that charcoal and cooking stoves were sold separately in retail stores conceived the idea of selling a set including a cooking stove, charcoal, ignition material and a net, which came into practical use as the product "Furusato Konro (cooking stove)."

Small trees, approximately 15 cm in diameter and 2 m in length, are processed into column material, smoked lumber, antibacterial lumber, materials for park fences and sand control dams, and many other kinds of products. Small trees are processed through the use of unique manufacturing technology to differentiate themselves from those produced by other competing manufacturers.

All of the officials of the association are conducting activities for sales promotion. In addition, a person living in Tokyo was appointed as councilor of the association to provide related information. Sales through the Internet also started in 2000. Thus, many efforts have been made to extend the market.

Table 2-1 Products in the project for processing charcoal and small trees

Material	Products	Uses
Block furnace charcoal	Shimokawa Mokutan (charcoal)	Fuel, purifying water, charcoal laying
	Karamatsu Tanso (Japanese larch carbon)	Purifying water, feeding, construction
	Yukashita Choshitsu Mokutan (charcoal for humidity control under floors)	Health-oriented houses
Open-hearth furnace charcoal (ash)	Shimokawa Tanso (carbon)	Improving agricultural soil, lawn caring, greening/horticulture
	Yusetsu Tanso (carbon for snow melting)	Promoting snow-melting
Other types of charcoal	Furusato Konro (cooking stove)	Cooking stove set etc.
	Tan CAN (canned charcoal)	Cooking stove set etc.
	Bincho-tan (high-quality charcoal)	Many uses
	Koyoju-tan (charcoal made from broad-leaved trees)	Many uses
	Kasseitan (activated carbon)	Many uses
	Mokusakueki (pyroligneous acid)	Deodorization, improvement in soil, insecticide, sterilization, insect repellent
Charcoal processed for columns	Karamatsu Enchu-zai (Japanese larches for columns)	Log houses, guide plates, signs, flower gardens
	Kun-en-zai (Smoked lumber)	Fences, flower boxes, benches
	Bofu Kako-zai (material processed into antibacterial lumber)	Pasture fences, wooden paths, wooden bricks, wooden stairs, supporting posts Panels for embankment, materials for civil engineering, greening and rivers

Note: Prepared from the Shimokawa Forest owners' association data

The total project amount in fiscal 1980 (settled in March) was approximately ¥290 million as indicated in Table 2-2. It increased to approximately ¥350 million in fiscal 1989 and ¥790 million in fiscal 1995, and has been between ¥700 million and ¥800 million since then.

Table 2-2 Expenses of the projects conducted by the forest owners' association

(Unit: thousands of yen; %)

	Sum total	Sales	Use	Purchase	Instruction and financing
1980	289,165(100.0)	88,489(30.6)	172,429(59.6)	25,158(8.7)	3,089(1.1)
1985	349,637(100.0)	134,544(38.4)	183,119(52.4)	29,650(8.5)	2,324(0.7)
1990	424,941(100.0)	218,642(51.5)	175,667(41.3)	26,802(6.3)	3,830(0.9)
1992	791,010(100.0)	566,372(71.6)	200,153(25.3)	19,232(2.4)	5,253(0.7)
1993	874,807(100.0)	640,066(73.2)	208,530(23.8)	19,775(2.3)	6,436(0.7)
1994	746,219(100.0)	511,107(68.5)	213,686(28.6)	16,132(2.2)	5,294(0.7)
1995	731,316(100.0)	484,247(66.2)	212,900(29.1)	17,964(2.5)	16,205(2.2)
1996	829,601(100.0)	597,245(72.0)	206,233(24.9)	13,523(1.6)	12,600(1.5)

Note: Prepared from the bills of the Shimokawa Forest Owners' Association's general assembly

The increase in the total project amounts owes mainly to the increase in sales projects. In 1980, the percentage of sales projects was approximately 30% of all the projects. Since the wood processing projects were expanded, the amount of sales projects came to account for 70% of the total amount, with the projects for use, purchase, advice and financing accounting for the rest of 30%. However, the annual output of charcoal, which was 118,931 kg in 1990, decreased to one third, 35,314 kg, in 1999. This was because of severe price competition caused by importation of low-priced charcoal and great changes in demand. Sales amount of material for columns sharply increases when demand for it as material for civil engineering increases, but the converse also occurs. Accordingly, the forest owners' association is always addressing development of new products using charcoal.

What is mentioned above outlines businesses conducted by the forest owners' association. It can be said

that the association had developed its business depending greatly on the administration. Such development represents the characteristics of the association's activities until the early 1990s, and its business details have changed more greatly since the mid-1990s.

(3) Development of the forest owners' association and improved human resources

The development was brought by the improved human resources. The forest owners' association had 76 employees as of April 2000. There are various types of employment, with 51 year-through employees.

Many of the rest are temporary employees, consisting of 30 for processing factories, 34 for forest management and 12 for the office. The association is one of the biggest employers in the town, and it also serves as a place for turning out leaders for the region. On another note, most of the employees are "U-turn" people (young people who worked or studied in big cities and returned to their hometowns to find employment) and "I-turn" people (young people who worked or studied in big cities and move to rural areas to change their career).

The total number of employees newly accepted by the association since 1989 is 48, including 14 new graduates from schools in the region, which only account for approximately 30% of the total number. Most of the employees in their 30s are U-turn and I-turn people. The turnover of the workforce is also great. Some people leave the association because business activities do not fit their purposes, or they cannot bear the heavy labor. On the other hand, the turnover of the workforce contributes to creating the dynamism of employees.

The high turnover is a factor which allows new ideas to come up in product development, and plays a role in building new human networks. Thus, the networks greatly help promote marketing for processed wood products.

What brought I-turn people – new inhabitants – to Shimokawa? It dates back to 1992, when a job-offering article appeared in a magazine specialized in forestry, and seven of nine people who inquired about the offerings were employed by the association. Since then, such acceptance of people has continued, and it provides the association with opportunities to develop new activities steadily.

Specifically speaking, the first stage is that even if new residents move to the town due to their enhanced awareness of the global environment and forest conservation, it happens that they often leave the association because work for forest management is boring and emphasizes productivity rather than ecosystems. The second stage is that awareness of old residents changes through continuous talks with new residents. The third stage is that such talks between old and new residents cause them to address specific activities. One of these activities was "Forest Communication in Shimokawa," a tour for experiencing forests and forestry, in 1996, in which residents on the third stage are involved. The gradual effects of the tour on community improvement include: participants in the tour moved to Shimokawa later; the project was conducted by the executive committee established jointly by the municipal government, the Shimokawa Society of Commerce & Industry and the forest owners' association and therefore developed local cooperative relationships.

The Shimokawa Industrial Cluster Study Society appeared as an extension of the effects. The fact that core members of the executive committee "Forest Communication in Shimokawa" participate in each working group of the study society also shows the continuity of the activities of the two organizations.

With an image of a bunch of grapes, the industrial cluster refers to a group of enterprises in various areas in a region which are structurally linked with each other, and is a strategy for developing regional economy through the interaction of enterprises. It is thought that the primary industry should be the core of the groups.

The Hokkaido Industrial Cluster Research Association was established by the Hokkaido Federation of Chambers of Commerce and Industry, the Hokkaido Employers' Association, the Hokkaido Economic Federation and the Hokkaido Committee for Economic Development. The Association paid attention to Shimokawa, highly valued the Shimokawa Industrial Cluster Study Society and has subsidized its activities for three years since 1998.

The activities of the Shimokawa Industrial Cluster Study Society in fiscal 1998 were conducted by three working groups (WG): "Grand Design," "Wood Processing," and "Product Development." The Grand Design Working Group shows the future direction of the whole regional society centering on forestry as the

local key industry and is trying to prepare a grand design which leads to specific activities.

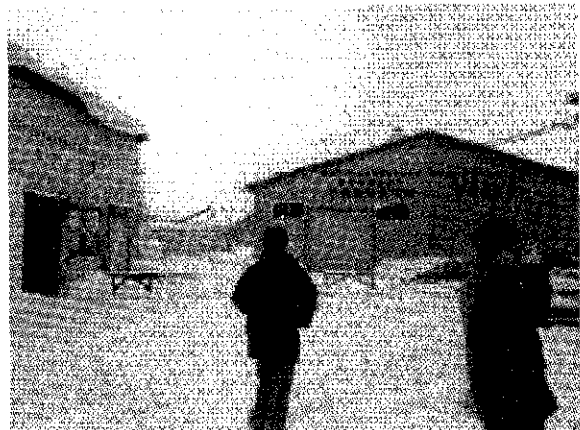
The Wood Processing Working Group is conducting comprehensive research on collaboration, cooperation and grouping for the development of the wood processing industry. The Product Development Working Group is researching and developing products with the theme of “forests.”

The Shimokawa Industrial Cluster Study Society is characterized by the following four points, according to the data of the society.

First, forestry is the center of the industries. Second, the unit for the industrial cluster is a municipality in a mountainous area, i.e., a mountain-type industrial cluster. Third, the region does not have any influential private companies, universities or research institutes with which it can build cooperative relationships. Fourth, policies not only for industries but also for regional society are required. In other words, the society aims to build a recycling-oriented and independent community centering on forestry, under the concept of “Zero Emissions (no waste).”

The forest owners’ association is designing a community where waste is recycled to be used as the second resource: using pyroligneous acid generated from charcoal processing as material for agriculture; making charcoal even from sawdust generated from wood processing.

For this purpose, the Industrial Cluster Study Society is trying to direct the future course of projects toward effective use of local unused resources, including manufacturing oil refined from leaves, and chips processed from branches to use them as spreading material in cow barns. As a matter of course, they do not neglect to conduct basic studies for putting their ideas into practical use. The activities in fiscal 1999 included 1) holding of lectures given by invited specialists and researchers and 2) holding of meetings to report activities conducted by the society, as well as ordinary activities and meeting for projects. In fiscal 2000, the society implemented eight projects, including “Regional Currency” and “Functional Food” with approximately 50 participants from inside and outside of the town, showing the multi-faceted expansion of the activities.



Processing and storage facilities

3. Factors which led to community improvement related to forest resources and the results

(1) Factors which led to community improvement related to forest resources

Shimokawa is attracting public attention as an advanced area in spontaneous development through the use of local resources, in spite of its depopulation. With the forest owners’ association as the core, the town is not only conducting business by felling and sales of forest resources, but also developing wood processing industries, and is shifting its viewpoint to the local recycling system.

The factors for such change include the existence of Mr. H. S., the former mayor of Shimokawa, Mr. Y, the current resident of the forest owners’ association, and Mr. H., a “new citizen.” In particular, Mr. H. S., as a director of the association and the person in charge of the municipal administration, commissioned afforestation to the association and earlier introduced the larger number of projects for forestry structure improvement than those in any other regions, to establish a recycling-oriented community through the use of forest resources.

It can be thought that the existence of the forest owners’ association, which had developed its potential, is the very reason why the town succeeded in charcoal-related projects by taking advantage of the wet snow damage, in spite of the rapid depopulation. It is believed that its success has enabled the association to develop independently.

Mr. Y. endeavored not only to develop products and find new distribution channels in processing projects of the forest owners’ association, but also to develop human resources through acceptance of U-turn and I-turn

people. He listened to ideas of such people, and developed their ideas through talks. Without his original idea developed through such interaction, the Industrial Cluster Study Society could not have developed.

Mr. H., as a new citizen and the director of the processing department of the forest owners' association, aims to develop local recycling-oriented projects, instead of conserving the traditional projects of the association. Moreover, he is creating a network of citizens as a measure for local spontaneous revitalization.

That is to say, when old citizens had difficulty in developing projects using forest resources, ideas of new citizens who moved to the town were linked with those of old citizens organically to arouse their enthusiasm for new development. It is no exaggeration to say that Shimokawa owes its community improvement to these people.

The second factor is the accumulation of facilities and equipment with the administrative supports. In a series of projects for forestry structure improvement, many facilities and equipment were purchased, constructed or improved: tractors, cranes, micro buses to transport workers, charcoal manufacturing kilns, charcoal manufacturing factories, facilities for laminated lumber, etc. Even the Gomi Hot Spring facilities (recreational facility for forestry employees) were remodeled.

It is worthy of special mention that the municipal government did not come to the front, but commissioned the projects to the forest owners' association as an "independent" organization. Political power of Mr. H. S. mentioned above and activities for community improvement with visions for the future have allowed capital accumulation and will bring forth fruit as the industrial cluster.

(2) Effects of activities for community improvement related to forest resources

The effects of activities for community improvement related to forest resources in Shimokawa can be summarized in the following three points.

First, citizens are beginning to engage in activities voluntarily. In addition to improvement in management of forest resources and processing facilities and equipment, new and old citizens are ready to unite and campaign to change traditional structures. Their efforts include activities for "zero emissions" and the development of environmentally-friendly charcoal products. Playing a central role in the activities, the Industrial Cluster Study Society has the possibility of creating venture businesses. In other words, if each idea of the society serves to promote business, spontaneous businesses will probably appear one after another.

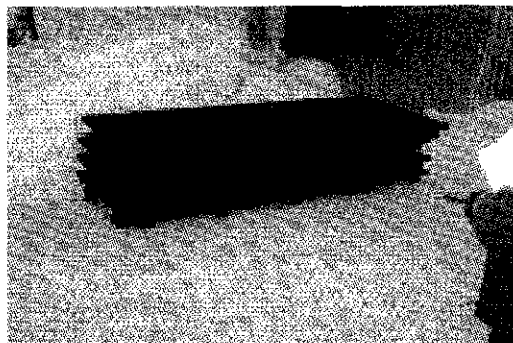
Secondly, the depopulation of the town is changing. Shimokawa was said to suffer from rapid depopulation like a "snowslide." Since 1990, however, I-turn and U-turn people and artists who moved to Shimokawa have brought a change in the town. It cannot be denied that the population has decreased gradually, yet the forest owners' association provides employment, and business promotion is expected to create opportunities for employment.

Thirdly, the activities for community improvement stimulate other industries in the region. When charcoal products were developed, local people involved in commerce cooperated in giving ideas. At present, the forest owners' association and five private companies are conducting joint research and development to utilize large Japanese larch trees. Activities by the forest owners' association have effects on local related industries and revitalize them.

One challenge is how to coordinate products and ideas resulting from research and development and put them on the market. Further efforts by Shimokawa are greatly expected.



Smoking house



"Shimokawa Mokutan" before processing