

Creating a sustainable community through recycle-based forest management and forest biomass

Shimokawa Town, Hokkaido



Background and Reason for the Project

Shimokawa is a town located in northern Hokkaido with a population of about 3,000 with 88% of its area covered by forests. To fully utilise this abundant resource, Shimokawa is working to combat global warming and revitalise the local economy through sustainable forest management, adding value to its unused resources, and expanding the use of forest biomass as thermal energy.

Project Aims

1. A stable supply of lumber and employment through sustainable forest management.
2. Resolve regional issues through integrated environmental, economic, and social initiatives.
3. Village revitalisation with woody biomass as a primary source of energy.

Project Outline

Recycle-based forest management

Shimokawa's forest development is based on the philosophy of 'recycle-based forest management' that continuously repeats logging and reforestation. The forest harvesting season is 60 years, and the town has ensured a forest base that allows for 50 hectares of logging and reforestation each year.

Utilising forest biomass

With the foundation of 'recycle-based forest management', woody biomass boilers have been installed in public facilities to supply heat as a new way to utilise the forest and its lumber. The wood

chips used as fuel are created from leftover wood at logging sites, thus making effective use of formally unutilised resources.

Ichinohashi Bio-Village initiative

The Ichinohashi area is located approximately 12 km east of downtown Shimokawa. With a population of approximately 90 and roughly 50% considered elderly (as of 2009), the village was struggling to maintain the community with the decline not only in population, but in their industries as well. In response, the village and its residents worked together to formulate the 'Ichinohashi Bio-Village Initiative', a grand design for the future of the community.



Forest owned by Shimokawa



Woody biomass boiler

Special Features and Innovations

Recycle-based forest management

To reduce the cost of and add value to forest maintenance, Shimokawa is developing initiatives for the comprehensive utilisation of its forests, including the introduction of high-performance forestry machinery, acquisition of the FSC (Forest Stewardship Council) forestry certification, and the installation of woody biomass boilers in public facilities.

Utilising forest biomass

In 2005, the first woody biomass boiler was installed at Gomi Onsen, a public hot spring facility in Hokkaido. Since then, more have been increasingly installed in public facilities, with a total of 10 boilers currently in operation. Compared to fossil fuels, the cost was reduced by approximately 38 million yen in FY2021, half of which was set aside for boiler replacement costs, and the other half was allocated to the village's childcare support program to improve services for residents of child-rearing age.

Ichinohashi Bio-Village initiative

The 'Ichinohashi Area Heat Supply System' initiative, which supplies heat to the entire community using woody biomass boilers. The community is also working to revitalise the community and create new industries based on self-sufficiency in thermal energy, including the construction of high-performance residential housing and a special forest products cultivation laboratory that cultivates shiitake

mushrooms.



Ichinohashi Bio-Village

Results of the Project

Recycle-based forest management

Currently, 3,000 hectares of planted forests are being managed in a recycle-based manner to stabilize local jobs and provide a stable supply of lumber to local lumber processing factories.

Utilizing forest biomass

10 woody biomass boilers supply thermal energy to about 30 facilities, and the village is self-sufficient with 56% of its total thermal energy coming from biomass boilers.

Ichinohashi Bio-Village initiative

Compared to 2009 before the village rehabilitation project was initiated, the population has slightly increased to 111 (versus 95 in 2009), and the ratio of elderly residents has decreased to 28.8% (versus 51.6% in 2009) (as of April 2022).

Issues, Problems and Responses

Recycle-based forest management

Shimokawa is working to secure and train forestry workers by accepting students from nearby agricultural high schools and forestry colleges for practical forestry training. In addition, they are also promoting forestry operations using ICT to improve efficiency.

Utilising forest biomass

While the installation of woody biomass boilers in public facilities that require large amounts of heat has been completed, as the boilers will need to be replaced around 2023, it is necessary to continue considering possible energy supply systems.

Ichinohashi Bio-Village initiative

The circulation pumps for the heat supply system's hot water operate at their rated output 24 hours a day and there have been issues with the cost of electricity maintenance. From 2019, the output of the hot water circulation pumps has been controlled by an inverter control to improve the efficiency of the entire heat supply system and reduce maintenance costs.

Future Developments (expected effects and project vision and issues)

Recycle-based forest management

Improve the efficiency and economy of forestry operations by securing forestry workers and promoting ICT-based forestry.

Utilising forest biomass

Supply heat to residential areas while keeping in mind the upcoming woody biomass boilers replacement period. Consolidate the area's heat supply/resources and develop heat supply pipelines to operate at high efficiency.

Ichinohashi Bio-Village initiative

Maintain and develop the Ichinohashi area through the creation of industries using the Ichinohashi area heat supply system.



Reference URL

<https://www.town.shimokawa.hokkaido.jp/jigyo/2020/01/post-10.html>

(More about recycle-based forest management)

<https://www.town.shimokawa.hokkaido.jp/section/2020/01/post-92.html>

(More about forest biomass energy)

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