

AWARENESS CHANGE THROUGH CONSENSUS BUILDING BETWEEN ADMINISTRATION AND LOCAL COMMUNITIES ON CONSTRUCTION AND OPERATION OF DISPOSAL FACILITIES WITH CLOSED SYSTEM

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INTRODUCTION

Final waste disposal facilities will be required in the foreseeable future for placing waste into a landfill despite continued efforts to reduce, re-use and recycle waste to build a recycling-oriented society.

Yamagata Village built a closed system disposal facility and started placing waste into a landfill in April 1998 under the motto of "disposing of the waste that you produce in your own village". The second-phase disposal facility is now being constructed next to the first-phase facility at the same site.

This paper describes the steps of local consensus building concerning the first- and second-phase construction of the disposal facilities, an approach to the second-phase construction and the public awareness of waste issues raised by the construction of the disposal facilities.

PROFILE OF YAMAGATA VILLAGE

Yamagata Village is located approximately at the center of Nagano Prefecture in the Chubu Area in the central part of Japan. The village is bordered in the east by Matsumoto City and gathers numerous tourists in summer who visit the Northern Alps of Japan. Suburban agriculture has been thriving with watermelons, Chinese yams, apples and flowers grown on a moderate slope at an elevation of 700 m.

Population has recently been increasing in the village, which is in the vicinity of Matsumoto and Shiojiri, because geographical and socioeconomic conditions have been improve with the construction of industrial complexes and an airport. Most of the present village population of more than 8,400 are from other municipalities.

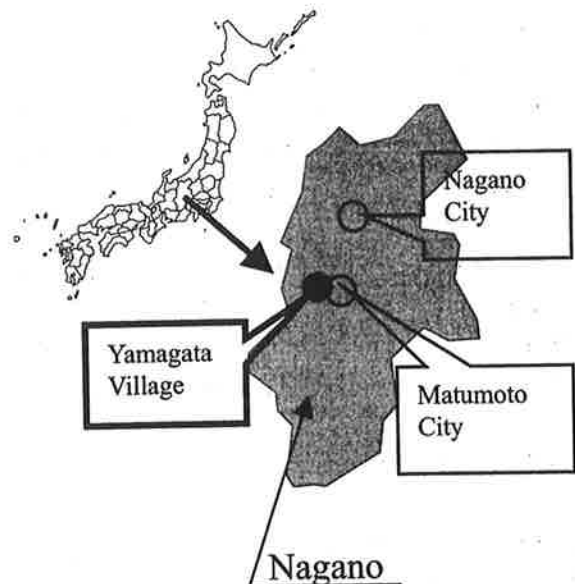
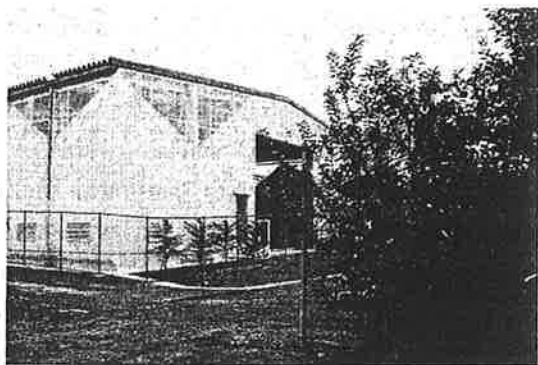


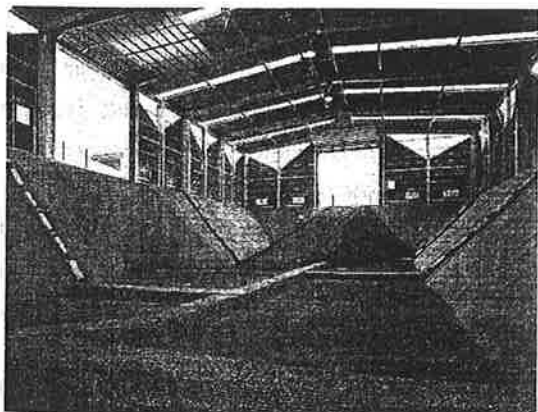
Figure 1 Location of Yamagata Village

OUTLINE OF THE "THANKS BB" WASTE DISPOSAL FACILITY

Final waste disposal facilities are classified into two major categories according to their function and whether internal and external control is possible or not. One is called the "conventional type" with a building in which waste is placed into a landfill. The other is the closed system disposal facility. The conventional disposal facility is directly subjected to external impact including the weather. Wind whirls the waste or rainwater temporarily puts burden on water treatment facilities. The closed system disposal facility is equipped with a cover to prevent the spread of waste or inflow of rainwater. Thus, the surrounding environment can be preserved and environmental loads can be reduced. Availability of a space under control enables the artificial control of the function of the facility.



Photograph 1 Facade of the first-phase disposal facility



Photograph 2 Inside the first-phase disposal facility before the start of landfill

The first-phase disposal facility has an 800-m² area for waste landfill and a 2,660-m³ capacity. The second-phase facility has an 875-m² area for waste landfill and a 3,460-m³ capacity. The second-phase facility is located to the north of the first-phase facility. The nickname "Thanks BB" was selected from among the candidates solicited from the public at the completion of the first-phase facility. It represents "thanks to the waste and its containment in a Big Box".



Photograph 3 Inside the first-phase disposal facility during landfilling

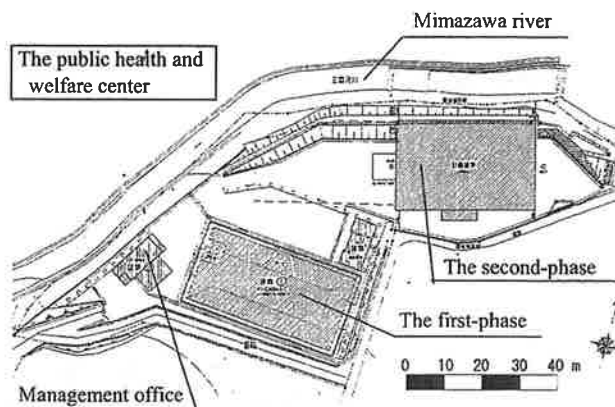
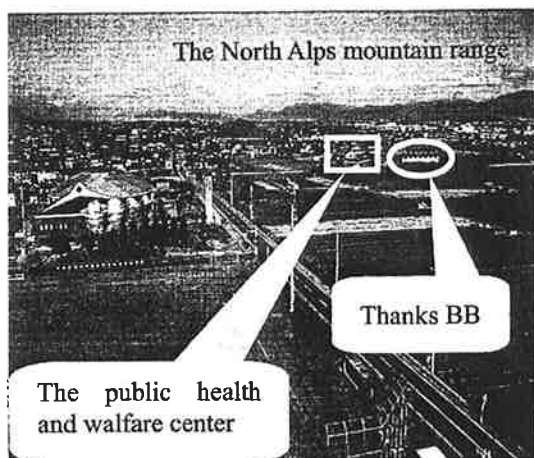


Figure 2 Layout plan

LOCATION OF FACILITIES AND LOCAL CONSENSUS BUILDING

The construction of final waste disposal facilities is always faced with big challenges such as the opposition of local community at the planned site that is worried about the environmental disruption or groundwater pollution. The problems are ascribable to no opportunities for direct contact between the administration and local residents, and the lack of understanding on the part of locals of the existence and

details of administrative organizations. In Yamagata Village, the residents are aware that it is themselves who produce waste and understand that it is their responsibility to dispose of the waste to the end. From an administrative viewpoint, the disposal facility was constructed at the center of the village where municipal facilities are concentrated. The facility is visible to numerous residents. It was located so that it was accessible on foot from the public office building in the village. It has been reported that many other municipalities were forced to construct waste disposal facilities in a mountainous area or along a municipal border where few residents visit. In Yamagata Village, the waste disposal facilities were intentionally located at the center. A public health and welfare center was later built on the opposite bank of a river adjacent to the disposal facilities and has been used daily for physical examination of villagers and also serving as a day-care center for the elderly.



Photograph 4 Location of the waste disposal facilities in Yamagata Village

One of the important aspects of the project is the administrative acceptance of a public suggestion. The closed system waste disposal facility was suggested during the consultations between the administration and the local community concerning the first-phase disposal facility. Seasonal yellow dust from China whirls across the village and sometimes covers the entire village in mist in early spring. Closed system disposal facilities are free from the influence of the

weather and require less cost of water treatment. The village selected the closed system disposal facility to obtain the understanding and consent of the people around the site although some attention had to be paid to the size and shape of the landfill to make the most of the investment in construction. In Japan, government subsidies are granted for waste disposal facilities including final disposal sites. No subsidies were, however, given for the roofing of the first-phase facility. In the construction of the second-phase facility, governmental subsidies were granted for the roofing because the roofing could reduce the cost of construction and maintenance of water treatment facilities and could also be highly cost-effective with other respects.

A water treatment facility of a daily capacity of 1.5 m³ was installed at the first-phase disposal facility. The water treated at the site is led to village sewerage rather than to rivers for further treatment.

When the second-phase facility was built, briefing sessions were held for the local residents as well as at the time of first-phase construction. No opposition was raised in any district to the plan to "construct a similar structure to that in the first phase and to leave the roofing of the first-phase facility intact". The public consent was obtained smoothly without any additional demand.

SECOND-PHASE WASTE DISPOSAL FACILITY AND ENVIRONMENTAL AND AESTHETIC CONSIDERATIONS

The second-phase facility is basically similar to the first-phase structure although the landfill area and capacity are slightly larger. Improvements were naturally made to make a better facility.

The first improvement was the construction of an environment-conscious disposal facility. Controlling dust was required when putting the waste in a landfill in the disposal facility. The earth covering and compaction after landfilling involved water sprinkling to stabilize the landfill material. The stormwater and snow on the roof of the second-phase facility were used for sprinkling. Pervious pavements were constructed

around the disposal facility to return stormwater and snow direct to the ground. Power-generating streetlights (using wind and solar energy) were also installed to use the spring monsoon and abundant annual sunlight energy. These streetlights are of small scale. Coexistence with natural energy was emphasized.

The second benefit of the disposal facility is aesthetic consideration. The public health and welfare center mentioned above has a large space on the south side to enjoy as much sunshine as possible. A parking place, entrance and hall are located in the space. The center constantly commands a view of the north face of the disposal facility. A promenade was constructed on the north side of the second-phase disposal facility and was vegetated to make it aesthetically pleasing when seen from either inside or outside of the disposal facility. The same design was adopted for the roofing and walls of the facility as that of the first-phase facility. A close view of a series of triangles forming the first- and second-phase disposal facilities was integrated with a distant view of extensive North Alps of Japan.

CHANGES IN PUBLIC AWARENESS OF WASTE ISSUES

Yamagata Village daily produces approximately 850 g of waste per villager (estimate for 2003). (Japan daily produces 1,132 g of waste per capita. Source: 2003 White paper on the environment). The public seems to be aware of waste issues. A meeting was held in January 2004 on the "reduction of waste". Villagers took the initiative of forming a working committee and promoting the organization of the meeting. More people attended the meeting than expected. "A field report of waste disposal", a video which was prepared by the village, was played at the meeting. Members of two contractors for the transport of incinerator ash emissions from the Matsumoto Clean Center and two representatives of residents made speeches. The transport company employees talked about the "change in awareness of individuals" and "dissemination of information on waste separation". The resident representatives spoke about their experience in daily

life. They said, "Waste that could not be collected as it was could be transported through the collection channel by separating it into smaller categories" and "Turning garbage into compost for use in growing apples proved effective".

In a session for exchanging opinions, some participants suggested that we should "take specific actions and cooperate with one another as an organization in addition to changing awareness of individuals". Others commented that we should "take the issue seriously" and that "more residents should be involved".

The meeting caused sensation. Villagers demanded subsequent meetings. Local electrical appliance shops were reportedly inundated with inquiries about the equipment that turns garbage into compost mentioned at the meeting.

The administrative authorities published GOMI-DAS/2004, a manual on waste separation, and distributed copies to all the households in the village. The manual specifies how to separate the waste for which numerous inquiries were made in relation to its classification, or toys made of various materials such as metal, wood and plastic. The booklet presents the classifications of waste when it is discharged and the considerations for discharge. Municipalities not only around the village but also out of the prefecture took interest in the booklet and have been making inquiries about it.

CLOSING REMARK

In Yamagata Village, small-scale closed system disposal facilities were adopted both in the first (in service) and second (under construction) phases. The waste disposal facilities can be managed easily despite high cost.

The villagers are becoming more aware of the need of waste reduction probably because they foresee that the small-scale facilities may reach their capacity in short time. This is an unexpected benefit both for the administration and local community.