A Case Study on the Preservation Process of Meijibashi Bridge as an Industrial Heritage in Comparison with Chikugo River Lift Bridge

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ABSTRACT: In this paper, the process of the preservation efforts for Meijibashi Bridge and the currently applied preservation mechanism in Japan are carefully reviewed. The study finding include for shows the followings: The heritage registration based on the amended law is not sufficient enough to assure active preservation of old civil engineering structures; NPOs and other local community groups could become central driving forces of active preservation of heritage bridges when they could get continuous support from the local governments as well as the previous operators; and finding alternative ways of reusing those structures, such as tourism destination and children's attraction, is a major step for secure preservation.
KEYWORDS: preservation, bridge management, industrial heritage, civil engineering,

1.INTRODUCITON

The Agency for Cultural Affairs defined civil engineering structures which the industrialization of Japan supported from Meiji era to the Second World War so industrial heritage recently regarded as resources of tourism as will, the agency began reviewing major industrial heritage candidates over Japan in 1990 for conservation. As a part of the effect the agency prepared a list of candidates for preservation in 1996 and structures constructed 50 years ago listed as the culture property and preserved. It is grown a method of preservation of Industrial heritage. Also, the agency defined industrial heritage structures as important cultural properties in 2001. This defilation added industrial heritage structures the value as cultural property. In 2003, Chikugo River Lift Bridge was designated as an important cultural property (Photo 1.1) by the agency and thereafter the bridge has been welcoming 80 thousand visitors every year.

However, the preservation of old industrial structures for regional tourism resources so not always an easy business due to the difficulty of creating local support.

Many of the structures that are regarded as cultural and historical important, are not registered yet. And many of them need to be repaired as soon as possible. In addition, Amarube Train Bridge, which is owned by the West Japan Railway Company, is an example that was removed because of deterioration.

The purpose of this paper to understand the role of concurred citizens and organization as well as the method of fund raising preserving for industrial heritage structures by case studying Chikugo River Lift Bridge and Meijibashi Bridge (Photo 1.2). Figure 1.1 shows the positions of two bridges.

Photo 1.1 Chikugogawa Movable Lift Bridge

2. PREVIOUS STUDIES

There are several types of studies preservation of industrial heritage, Agency for Cultural Affairs issues many reports and surveys in Japan from 1990. The Committee on Historical Studies of Japan Society of Civil Engineers (JSCE) is also investigating industrial heritages in Japan.

Yasuda et al (2004) conducted questionnaire survey about simple processes of preservation and the present condition of industrial heritage for 81 owners of industrial heritages.

Nagata et al (2005) make survey about repair plan for 31 iron bridges repair business cases.

Kon et al (2002) presented a report about suggestion on the preservation activity of old Shihoro Line's bridges by citizens.

Sugihara et al (2006) prepared a report about structural and material investigations of Meijibashi Bridge and Yamaguchi et al (2006) summarized a questionnaire survey about history of Meijibashi Bridge.

Ito (1992) showed the list of movable bridges in Japan and their presence and its historical evaluation.

Photo 1.2 Meijibashi Bridge

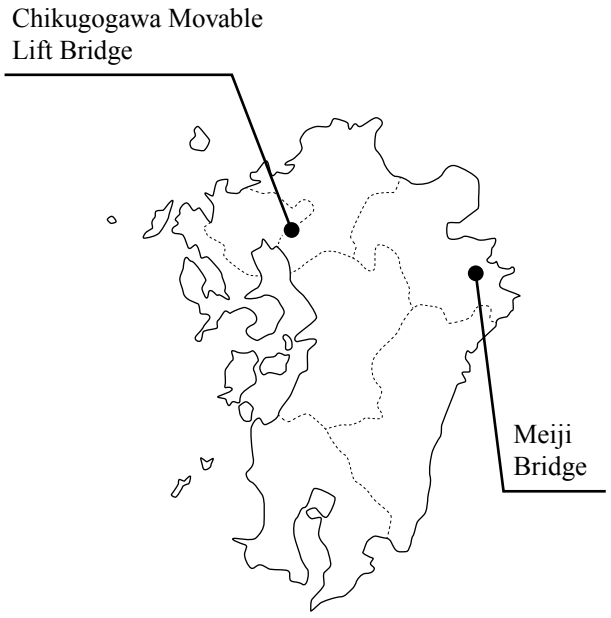

Figure 1.1 A position of three bridges (Map of Kyushu)

3. RESEARCH METHOD

Major in formations used in the discussions on this paper are based on the following two sources.

1) Printed materials: books and articles which are concerned about Meijibashi Bridge, Chikugogawa Movable Bridge, particularly preservation of Industrial heritage
2) Interview: Conducted by the author to major participates of the preservation processes of both Meijibashi Bridge and Chikugo River Lift Bridge, that includes Kohei Yamaguchi (JSCE), Fumiko Taura (Kyushu University), Okawa-si, old Morodomi-machi (Saga-si), Chikugo River Lift Bridge Foundation, and Agency for Cultural Affairs.

4. OUTLINE OF MEIJIBASHI BRIDGE AND CHIKUGO RIVER LIFT BRIDGE

4.1 Meijibashi Bridge

(1) History of Meijibashi Bridge

Meijibashi Bridge was constructed in 1902. (see Table 4.1) It was used as a national highway until 1961. Now, it was used as footbridge because national highway next to Meijibashi Bridge doesn't sidewalks. Therefore, habitants in Nozu-machi need Meijibashi Bridge as bridge. It is the second oldest

bridge in Japan. It is the oldest steel girder bridge of the existed. Thereafter, it just has been used as a footbridge. In 1990, it was scheduled a Nozu-machi's an important cultural property. It was also scheduled in Oita prefecture and listed civil engineering heritage in Japan society of civil engineers.

However, it was not enough maintenance from construction repainted has only one time, nevertheless of use for 100 years. So that, bridge steel girder of Meijibashi Bridge hardly has painting

Meijibashi Bridge has evaluated from two points.

First point is technical value of Meijibashi Bridge; it is the oldest bridge in existed steel girder Road Bridge in Japan. In addition, Meijibashi Bridge has the then balustrades made by cast iron in Japan today. Other bridge has their balustrade is only Kiyomi Bridge in Kagoshima, Japan. Piers also has made by rubblework is greatly rare.

Second point is regional value of Meijibashi Bridge, It predict that Meijibashi Bridge was constructed purpose of military road or railroad nonetheless of few transport by car at the time. Thus it was made as an steel girder bridge, and it had continued to use as a roadway bridge until 1991 for ninety years.

(3) Ongoing Preservation Process

A history of movement for preservation about Meijibashi Bridge and to people and organizations concerned about preservation of Meijibashi Bridge is shown in Figure 4.1.

A member in Hitachi Zousen appealed for a bridge researcher in university, which triggered movement for preservation of Meijibashi Bridge. They invested Meijibashi Bridge in the field. The bridge researcher presented about the bridge investigation in seminar on Japan Society of Civil Engineering (JSCE).

A working party about Meijibashi Bridge was made by JSCE. Purpose of the party at the beginning is to preserve Meijibashi Bridge, which is the oldest steel girder bridge of the existed in Japan, everlastingly. Members of organization are mainly bridge researcher and bridge engineers, and an administration staff and local history researcher participated. They investigated a condition and a history first in 2004. As a part of lifelong learning, a bridge engineers in the working party only presented about Meijibashi Bridge side by side with investigation in local seminar. Results of investigation presented in Committee on Historical Studies in Civil Engineering of JSCE in 2005.

The bridge has listed as an important cultural property in Oita-prefecture and a civil engineering's heritage in JSCE.

4.2 Chikugo River Lift Bridge

Elements of Chikugo River Lift Bridge are shown in Table 4.2.

This bridge was constructed in 1935. It is bridge which is moved a central part of bridge' s girder up and down (lift type bridge) and it is the oldest bridge of existed lift type bridges today. It has

Table 4.1 Elements of Meiji Bridge

Construction year	1902
Bridge length	32.6m
Span	2
Bridge type	I-type steel plate girder bridge
Historical value	the oldest iron girder bridge of existed in Japan

Table 4.2 Elements of Chikugogawa Movable Lift Bridge

Construction year	1935
Bridge type	Movable lift bridge
Bridge's length	507m
Decision of preservation	1996
Listed as a tangible cultural property	1996
Designated as a important tangible cultural property	2003
Historical value	the oldest lift bridge of existed in Japan

been evaluated in Japan.

Preservation process of Chikugo River Lift Bridge is shown as Figure 4.2.

An owner this bridge was the Japanese National Railways (JNR) until 1987. Thereafter, Okawa-city and Saga-city owned the bridge from 1992 because two governments consulted with JNR on the preservation of Chikugo River Lift Bridge for request of preservation by citizens.

In 2003, the bridge was scheduled as an important cultural property in Japan, and 80 thousand users including tourist and habitants who live around bridge visited the bridge every year.

5. DISCUSSION MAFOR ISSUES OF PRESERVATION OF INDUSTRIAL HERITAGE BRIDGES IN JAPAN

5.1 Difficulty of Funding

Like repainting steel girder in case of Meijibashi Bridge, fund for maintenance constantly need in order to make industrialize heritages to maintain good condition. Initial cost for repair also need in a case of scheduled as a cultural property.

Meijibashi Bridge hasn't had fund for repair and clearance until today. So local government couldn't pay fund for repair and preservation. They also has prospected to obtain fund for maintain. If the bridge is scheduled as an important tangible cultural property, they only get grant. When they repair the bridge, they must pay a half of all cost.

On the other hands, in a case of Chikugo River Lift Bridge, local government had preparation for disposal of Land where was disused Saga Line by the government.

Government also haven't need cost for clearance of Chikugo River Lift Bridge in order to

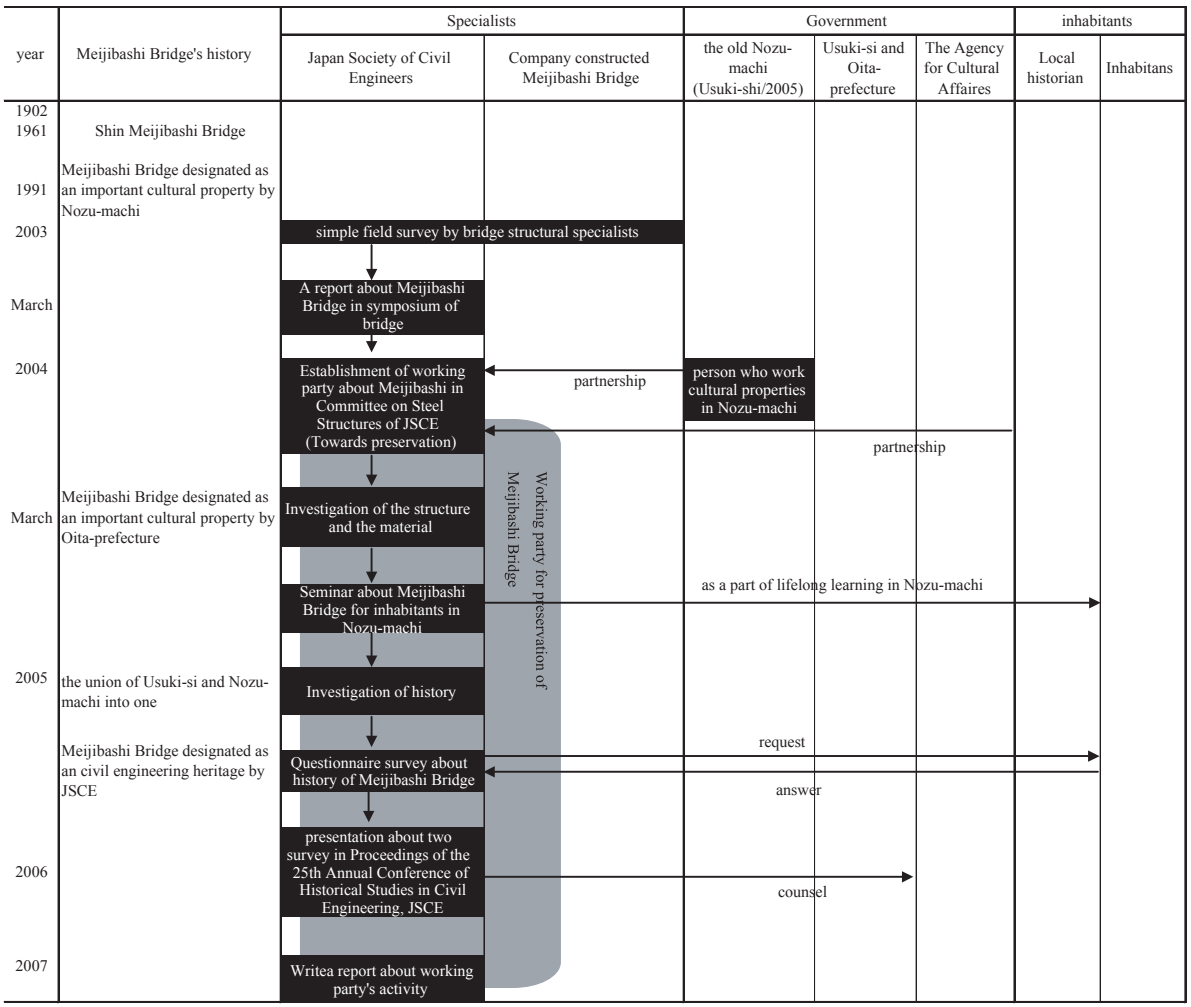

Figure 4.1 Preservation process of Meijibashi Bridge

preserve the bridge. Because these expenses are the same amount, they have offset, and preservation of the bridge had decided. . (Figure 5.1)

Thereafter, local government established Chikugo River Lift Bridge sightseeing foundation to use a preparation for disposal.

Nevertheless system of preservation for Industrial heritage didn't exist, Chikugo River Lift Bridge have decided preservation.

It is difficult for preservation of Industrial heritage to secure fund for repair and maintenance in the present system for cultural property. But Industrial heritages like Meijibashi Bridge need make use of characteristic of road construction. The owner and people to have request for preservation don't prepossess with a cultural property and need seed systems to secure fund for preservation.

5.2 Citizens' recognition on the preservation

In order to preserve bridges of Industrial heritage, it needs will or agreement of citizens on the present system for preservation of Industrial cultural properties.

Meijibashi Bridge was started to preserve by specialists of bridge as a part of activity on Japan Society of Civil Engineers, and they investigated a condition of bridge and they examined Meijibashi Bridge's history for eternal preservation. Then, they held a seminar about Meijibashi Bridge for citizens and they keep information of bridge from citizens. However, these activities haven't connected citizens' motivation on the preservation of Meijibashi Bridge.

In case of Chikugo River Lift Bridge, citizens in Okawa-city, in where Chikugo River Lift Bridge was constructed, have recognized bridge's value,

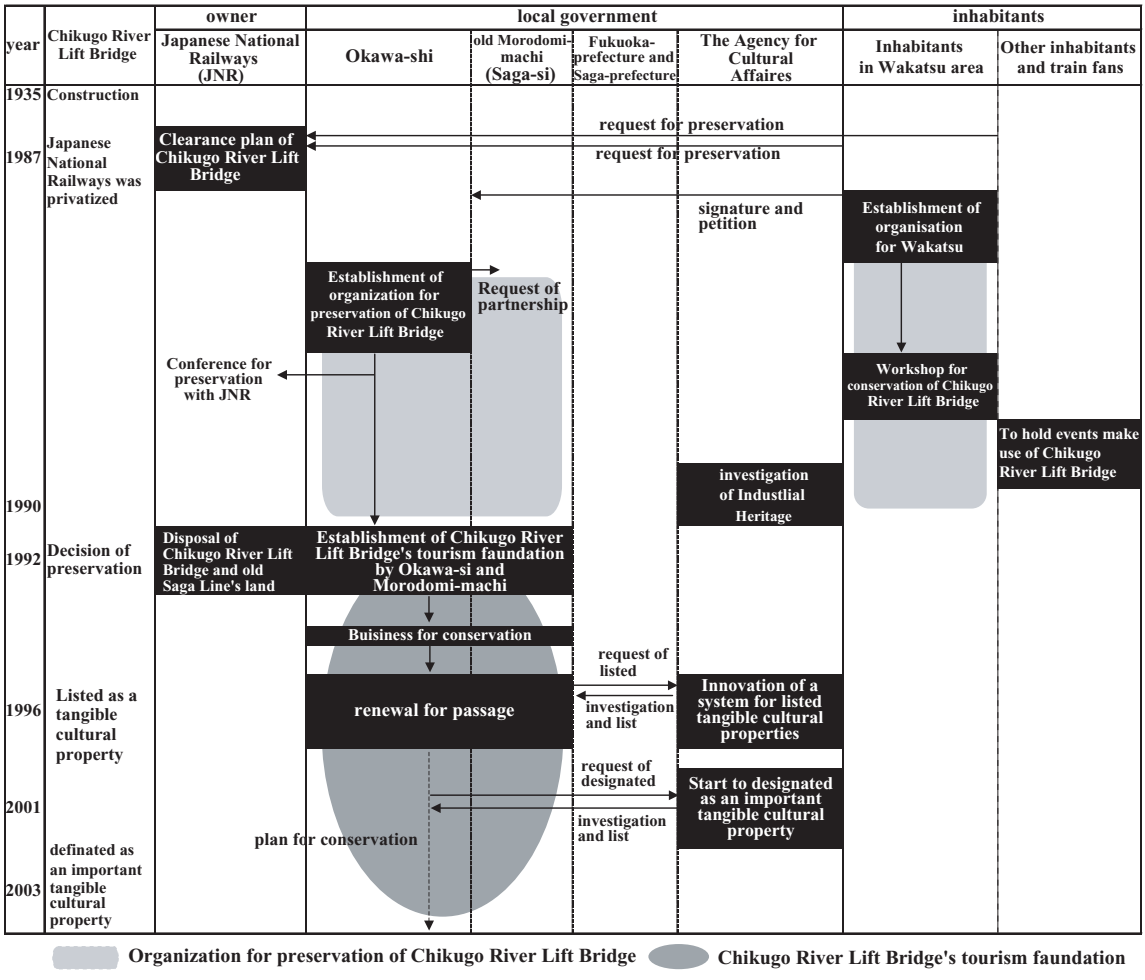

Figure 4.2 Preservation process of Chikugo River Lift Bridge

and they conducted a campaign to collect signatures and requested for preservation to local government and JNR earlier than others. As a result, It was easy for Okawa-city, which is a center of organization for preservation, to negotiate with JNR and government through citizens' will.

When bridge is scheduled important cultural tangible properties, owners need to organize plan for preservation and conservation. Partnership of citizens must need in order to continue to preserve. So sufficient condition to preserve Industrial heritage is for region and for citizens because Industrial heritage bridge need more money to maintain.

6. CONCLUSION

The major findings of this paper could be summarized as the following.

1) In case of standing on the present system, citizens' request must need in order to preserve Industrial Heritage Bridge. It is difficult for local governments to act toward preservation without citizens' recognition or motivation for preservation, especially the present preservation system for cultural property.
2) Preservation method, especially funding, of Industrial heritage is different from ordinal cultural properties'; for example, not only local governments and the Agency for Cultural Affairs but also Ministry of Transport, the Ministry of Agriculture, Forestry and Fisheries, and other ministries and government offices was concerned with maintenances of Industrial Heritage because many Industrial Heritages continue to use as infrastructure.
3) In case of preservation activity by bridge specialists, it is important for them to penetrate bridge's value to preserve to citizens first.

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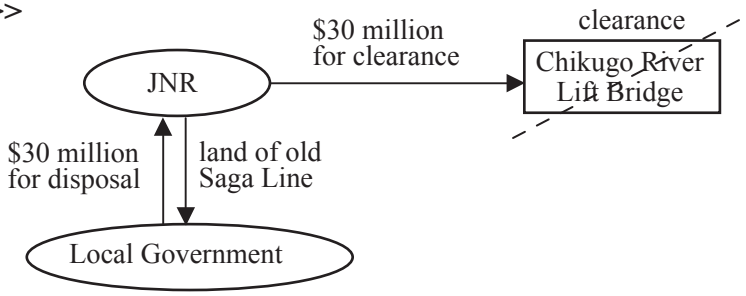

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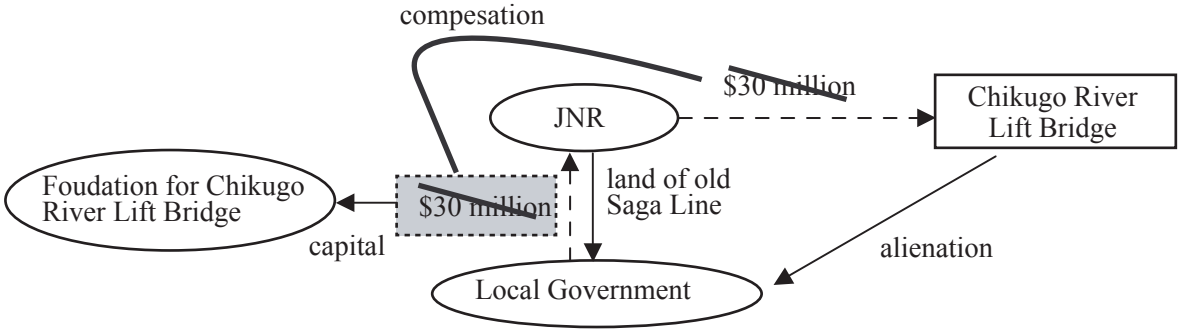

Figure 5.1 Flow of fund for alienation of Chikugo River Lift Bridge

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