A STUDY ON USUAL TRADITIONAL DISASTER PREVENTION MEASURES IN NORTH OF AKITA PREFECTURE, JAPAN

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SUMMARY

The object of this study is to clarify the usual traditional disaster prevention measures in Hanawa district of Kazuno city and Umenai district of Futatsui town, North of Akita prefecture, to apply these various wisdoms of ancestors, which now exist in the regional society of this district, to present disaster prevention measures. The relevant data were collected by the fieldworks for the two wooden traditional houses with wooden arcades ‘Komise’ in Hanawa district and the wooden traditional houses with thatched roof in Umenai district and also by the survey of references on the history of Kazuno and Futatsui.

The regional people have taken countermeasures to disasters such as an earthquake, flood, famine and fire. The traditional measures for disaster prevention are not specialized in one disaster. The following knowledge was acquired. The share management and the stockpile of local resources by the resident are effective. It is important to know building structures which are appropriate for the climate in the districts. It is important to consider a measure in a historical cultural background. The various structural functions, which can be used for the daily life, are desirable.

1. INTRODUCTION

A calamity becomes remarkable when external force, such as an earthquake, heavy snow and rain etc., exceeds the disaster prevention capability of the community concerned. Therefore people have raised disaster prevention power taking advantage of a past calamity experience from ancient. The disaster prevention capability of regional society is supported to what is called disaster culture. Not only the structure aiming at damage deterrence but the system of the society which aims at damage mitigation and the device on a life are included in it.

The object of this study is to clarify the usual traditional disaster prevention measures in several north districts of Akita prefecture, to apply these various wisdoms of ancestors, which now existing in the regional society of these districts, to present disaster prevention measures. The relevant data were collected by the fieldworks for the wooden traditional houses in these districts and also by the survey of references on the history.

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2. OUTCOME AND DISCUSSION

2.1 Outlines of investigation field

2.1.1 Location, Climate and History

Figure 1 shows Tohoku area, North part of Japan, location of Kazuno city and Futatsui town and table 1 shows those outline. Two districts, Hanawa and Umenai, were chosen as investigation fields. The former locates in the middle of the city and the latter locates in the north of the town.

The provinces where Kazuno city included are known from ancient times as a productive land. The gold mine was discovered at the beginning of Keityou year (1596-1614) and it is said that rows of houses were formed at Hanawa. Hanawa district had prospered as a castle town which had important functions, also as a key point of traffic of the Nanbu-han which governs a vast territory at the Edo period. Moreover, it is a region where develops before the 2nd World War with Osarizawamine that has about 1,200 years history.

The Futatsui town is a comparatively new municipality that amalgamates by four town and villages in 1955. These town and villages consist by several times of amalgamations in the abolition clan since in 1871. So each village has different features; historical background, way of living and geography etc. Southern area with wide of national forest, and thus forestry has been performed from the Edo period to Showa era. Till the wood boom at the Showa era, there was crowded around the timber yard where was called the largest lumberyard in the East. On the other hand, because of the Akita-sugi (cryptomeria japonica) resource was not rich than the southern part, the life using the surrounding copse focusing on agriculture was performed from in the northern part for many years. Taneume village where the antecedent of the Umenai district is included is a village that Tane village amalgamated with Umenai village in 1889. The history of the village is old, we can see the description of Umenai village in 1605 [1]. Though in those days the district was an undeveloped land, after about 200 years in 1815, 150 houses in Umenai village were recorded [2].

<table>
<thead>
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<th>Table 1 Outline of two fields</th>
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<tr>
<td><strong>Kazuno City</strong></td>
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<td>Population</td>
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<td>Climate</td>
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2.1.2 Disaster

Figures 2 and 3 show frequency of main disasters in some periods in investigation grounds. Figure 2 shows the frequency of those in Kazuno city in 265 years from the Edo period to the Meiji era (1644-1909). Though earthquake disaster occurred slightly 5 times in the whole period, following disaster...
occurred frequently; bad crop and fire are 4 years in 1 time and flood is 7 years. It seems that the countermeasures against these disasters will be very important for regional inhabitant. Especially, the conflagration which occurred on May 27th, 1905 in spreading to wreathe district which is the central urban district, 134 houses are lost in fire, and still, it is handed down as "conflagration in 1905" at present. Snow measure seems also necessary in this place because of long snow season. In this paper we will analyze several case on bad crop, fire, flood and snow measure of Kazuno city. Figure 4 shows the number of lean harvest, great bad crop and famine, where cold weather damage, disasters such as frost damage, insect damage and drought are not included.

2.2 Traditional disaster measures of Hanawa district

2.2.1 Bad crop measures

In Muika-machi which is a town constitutes the Hanawa district, a wealthy merchant has delivered their private storage to the Town for relief. Though bad crop in the late Edo period continued more than ten years and their property became dangerous, he contributed to the relief by providing his several paddy field and field for the neighborhood. The town carries on these lands in the cooperation, establishing
property management organization mainly on the landowner, making stockpile and afforestation, disaster correspondence would be carried out. And, in the village around Hanawa, rice crop was done by the collaborative activity on village common, and not only unhulled rice was preserved in the villages granary, but also lending rice and the repayment by annual installments were done. All town homes had been provided with unhulled rice and cedar log by the use after the conflagration in 1905 of this common property in the restoration countermeasure.

Figure 4 shows the breakdown of the bad harvest of Figure 1. According to Ichikawa [5] “lean harvest” is that the yield of the rice decreases 1/4 of the common, “great bad crop” and “famine” are respectively decreases to 1/2 and 3/4. It can be guessed to be the severe life situation, because the lean harvest in which the yield reduces than bad harvest by half is frequently generating. In this district where Yamase blows, the following have been cultivated: Japanese millet which is resistant to cool weather damage and the millet which is resistant to the drought, wheat, soybean and buck wheat. Especially, this region is also being produced on the food practice in bad crop from such life experience, since it is originally food practice of the autarky type using miscellaneous grain such as millet and buck wheat, soybean and wild plant [6]. In Tohoku area, the bad crop continued from Meiji and Taisho Era to 1935, and paddy field trade before the harvesting and slave trade on farming village became also a social problem.

In the age which was delivering the rice as a tax, two bad crop countermeasures seem to be contrivance of the life various places in Japan. However, it seems that wisdom had been accumulated daily besides the local populace's cooperating and preparing for a useful resource that can be used and the effective use in Kazuno where harvest is only once period in a year and the long winter had to be overcome.

2.2.2 Fire measures
Photograph 1 shows a plaster finished north-side wall of the main building. In the hearing investigation, the wall was for preventing strong north wind and cold. It is thought that not only the protection against the cold but also a fire measures because there is description that Tori-niwa became a shelter road [7], as is shown in the photograph of a town house which raised Udatsu : a traditional fire wall [8]. A part of Udatsu has now been kept in one of the houses (photograph 2).

Though it is possible to observe the use of soil wall and ordinary plaster wall of Udatsu conducted to urbane house as fire control in each place in Japan, these are weak in moisture and snow. In another region in snowy country Akita, there are small examples. Therefore, it can be said that soil and ordinary...
plaster walls are one of the features of Kazuno. This fact is attributable to the influence of the sphere on the culture of the Nanbu-clan territory where the main sphere region of this provinces is the Pacific Ocean side where there are little snowfalls.

Measures on the lifestyles are told such as “Since the spot is left and it becomes impossible to ascertain fire extinguishing in many cases, don't burn fire in the afternoon”, “Don't drain the water of a bath tab till a morning”. Photograph 3 shows the fire prevention prayer called Hibuse, which performed once a year in every neighborhood. In this event the attention to a fire is called. The town officer sprinkled salt and water in the head for this Shinto priest, each key point of a town was purified, after that the amulet of "care of fire" was distributed to each houses from the shrine.

In Hanawa district, transmission for fire and fire prevention prayer has remained each place in Japan. Not only Muika-machi but also Shin-machi, in the neighborhood of these districts Hibuse event has now been held on the day of a festival. In Hanawa district, contribution was collected in the neighborhood and a car pump was purchased from the lesson of the big fire of Hakodate in 1934. It seems that it keeps improving the concern for a fire measures by handing down the conflagration at the Meiji era, and the importance of fire prevention being handed down.

2.2.3 Flood measures
In Ogake village, Hanawa neighborhood, since the irrigation canal was frequently damage by flooding, people worked cooperatively for controlling their common forest which provided woods for disaster prevention construction.

2.2.4 Snow measures

In Hanawa district before, there was a shopping street equipped with wooden arcade, called Komise, on the both sides along the main street. The length about 1km from the south to the north [9]. Photograph 4 is the present view of Komise. According to the document [10] “Snow piles highly like a roof which seems to be a road”, in case of snow coverage. Horses passed along the way out of Komise and thus it seemed that horses walked on the roof of Komise. This wooden arcade played a role in securing the winter life of people as the only traffic road in the snowfall season.

Since Komise was the private land, its width seemed to be different in each houses; 150 cm in about narrow place and 270cm in the large place. It was confirmed that the pillar interval of one investigated Komise was 180cm, the slot for putting a door into each pillar remained and there was the contrivance which prevents that the fallen snow goes into in Komise and the same type of Komise in Hirosaki city and Aomori prefecture. Figure 5 shows shop appearance in Hirosaki city at Edo period. From this features, the structure of Komise in Hanawa seems to be the same structure as in those in Hirosaki and Aomori prefecture.

The function of Komise is not only as for the transportation but also a part of the store which displayed goods by sending board or as children’s playground or as religious place. Photograph 5 shows the inside appearance of Hanawa’s Komise in 1955’s. In Hanawa district, market was held periodically along the Komise from Edo period to 1968. In
addition to the cooperative works for opening a market, the feature of Hanawa’s Komise is in the place for exchanging labor, goods, and information in the mountainous region. It can be said that Komise was an excellent device in snowy countries. In addition to a measure against heavy snow, Komise played many important roles for the people in the north countries.

Because of many reasons Komise began to be removed; 1) Change of transportation system which lasts to Showa from Taisho era, 2) Public works of pavement and widening of the road were advanced as the poor harvest which continued from the beginning of Showa, the business and unemployment policy by change in economic structure, or a measure against a poor harvest. Especially, the road construction was widely proceeded through the high economy growth period correspond to the automotive society, and thus most of Komise disappeared. The establishment place of market has been moved from along the road to the corner of the town along with it. It means that the road would be required for ensuring the traffic function by snow removing machine work, that the private land as public space becomes mere private land and lost the relation to the disaster prevention which all the members of the region has participated, it had only a single function of traffic.

Komise was a wooden shopping arcade that was also called Gangi, and was seen in widely in the snowy zone from Tohoku to the Hokuriku area. Komise in every places were removed with the development of automobiles. The Komise in Hanawa has lost the main function on snow measures, however, the function exchanging goods and information has now been maintained.

2.3 Traditional disaster measures of Umenai district
2.3.1 Flood measures
In the Edo era, it was called “Kawa-kake” (which means river is lacking) that a river rise and fields are ruined. Flowing quantity increased with the thaw water and the heavy rain in two big rivers in Futatsui, and the damage of the weir and the gutter was generated frequently. Then, the improvement was attempted by using two digging technologies, “Ana-seki” and “Iwa-seki” for stable supply of irrigation water. The former means hole weirs for making tunnels, and the latter means rock weirs for digging weirs in bed rock. It is said that one of the rock weir is being used now which was made in a 1615-1623. Moreover, since references of town history describes the fact that willow trees were embedded laterally on riversides for their reinforcement, it is easily supposed that the prevention-of-flood woods were also employed [13].

2.3.2 Bad crop measures
Until the beginning of the Showa era, food was stocked at saving warehouses of each village. Since the feudal administration period, the warehouses was called “village warehouse”, which was used for
protecting village people from lean and bad harvest [2]. Satake clan, who was the governor of Akita had agricultural administration method called “Satake’s rice field method” for crisis managements. This custom continued until the beginning of Showa era, and the position of the village warehouses is written in the home map which is presented in history references of Taneume village at 1955. According to the history book the rule succeeded from the Edo period is stipulated by reserve rice management of Taneume village in 1891.

The amount of paddy that had been saved at that time corresponded to 20 percent of annual products in the year sales in the village. Although the right of management of a warehouse suited the village mayor from the middle of Meiji era, actual management was carried out in the district. The poor farmer was able to borrow unhulled rice for storage 3 times in a year. They had to pay back unhulled rice in kind with interest at the harvest time.

There was at least one warehouse even in a small village. The scale and the number of warehouses were different depending on the size of villages. Moreover, there were warehouses which were supported by each farmers. They supplied their own crops as sharecrops. Thus, it is said that the head family might deliver branch-family sharecrop. In this region, because of the limited area of paddy field, mountain plants and cereals such as millet and soybeans were eaten as foods. Usually cereals, radish and others were eaten by mixing them with rice.

2.3.3 Fire measures
In the district, several times of fire occurred after the Taisho era. The fire, especially on April 15th of 1900 caused heavy damage to the Umenai district. Most part of the district, 37 doors were lost. Photograph 6 shows a general view of a warehouse. Rice warehouse of every door is built in a place left from the main house that becomes a house where is easy to become the origin of a fire because of the spreading prevention.

The district was surrounded before by the weir which was used for irrigation and daily life. The weir was once used for fire extinguishing. At present the weir was repaired, so that the water can be used even in the winter season. It is also called the “Precaution weir” now. Photograph 7 shows the situation of the weir which flows the inside of the district.

After a fire occurred in the district, in addition to rice, log from the common wood was provided as architectural materials to a person whose house was burn out. The bridge is built by using this wood, and the emergency has been overcome with sharing the common property. Management of the common property is also carried out by the rule from the ancient at present (photograph 8).
3. RESULTS

The present study clarified the effectiveness of traditional disaster measures to disasters such as bad crop, fire, flood, and snowfalls in two districts of the north Akita Prefecture. The present results should be applied to modern disaster measures.

1) The common management and savings of regional resources are effective for local people: Common to any disasters, managements and savings of community properties in the districts are operated by the people in use for daily life, though a slight difference is there in executive organization depending on the districts. Management of the local resources by the residents themselves is not only functions, in addition to a limited function to a stockpile, for promotion of quality of every life. Therefore, it is important to consider the management and the stockpile of local resources in view of training local residents according to the social structures in the districts.

2) To grasp the effective regional resource for emergency: Both districts also established the food practice using miscellaneous grains and plants of the mountains, because of cool climate of the districts, and thus of low yield of rice harvest. It can be said that accumulation of the wisdom by observation and everyday-life environment makes it possible to clarify the effective local resources for emergency.

3) To clarify measures by taking account of regional features: The two districts and their type of houses are different from each other. In Hanawa district an old merchant’s house is now preserved. The house is built as rows of houses which are equipped with Udatsu for protection of fires by introducing stud wall frames, the both sides of which are finished. On the other hand, Umenai where farmhouse dotted each house has prevented the spread of a fire in consideration of arrangement of a warehouse. For disaster prevention, it can be said that the measure in consideration of such a district’s feature, characteristic rows of houses and the street form is required.

4) It is necessary to think about countermeasures along the historical and cultural context in a region concerned.

5) It is necessary to build houses by taking account of structures which is appropriate for the climate characteristic in the region.

6) The disaster prevention education at home must be important. It must be effective for succession and continuation of enlightenment activities by using festivals of districts so as to include whole community.

7) The multifunctional construction of communities must be preferable to everyday life as well as to disaster measures.

4. CONCLUSIONS

Two districts surveyed in Akita Prefecture are accepted to be leading districts in view of the depth of tradition and of the high standard of culture. The everyday life in the districts may differ from those in cities, thus measures for disasters in the districts may be somewhat different from those of cities. Especially, it is thought that "Strong posture where it tries to live as a regional community" before very often differs greatly from "Disaster prevention consideration of the modern people who tend to rely on the administration", and suggests a new ideal way of disaster measures in the future.

As depending on the location and the history suffered from disasters, countermeasures of the two districts surveyed seem to be different from those of congested area in large cities. However, it seems that the
tradition and culture of an area still remains in the present life without depending districts. Especially the strong attitude, which intends to be effective as a local community, is greatly different from the modern disaster prevention consciousness who tends to depends on administration.

5. ACKNOWLEDGEMENTS

I give a reward to the people in Kazuno city and Futatsui town including people in the Hanawa and Umenai district, who helped the present investigation. Moreover, gratitude is also expressed to Professor Tsuneo Takahashi of Tohoku Institute of Technology, students of Division of Architectural History and Design and Masaaki Tanaka who participated in joint investigation.

6. REFERENCES

(Published in Japanese)