

REGENERATION FOR SOCIO ECOLOGICAL PRODUCTION LANDSCAPE IN SERIOUSLY ENVIRONMENTAL DAMAGED RURAL AREA

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ABSTRACT: This research aims to explore the regeneration for socio ecological production landscape in seriously environmental damaged rural area through the field survey of prior efforts around the area. In Fukushima, six years have passed since the nuclear accident, and evacuation orders for about 32,000 people living in Namie, Iitate, Tomioka and Yamakiya District of Kawamata, have been lifted by April 2017. However, since the socio ecological production landscape has lost, the lifting of this evacuation order will not lead directly to the return home of residents. The challenge is how to restore people's former life which was based on agriculture and forestry and this research looks into the ways of regenerating the socio ecological production landscape, using interview with local community representatives and field observation. The case study has revealed that the decontamination of the forest is still in a trial stage and the key obstacle is the fact that there are still a few people who wish to return because the future concrete outlook is still not visible. However, a new community has been gradually generating by the approach which a part of farmers resume farming with external researchers and volunteers with interest. It seems to lead to the potential for regeneration of the socio-ecological production landscape.

Keywords: Socio-ecological Production Landscape; Serious Environmental Damage; Fukushima; Community Participation

1. INTRODUCTION

1.1 Background and Objectives

Recently the number of mountainous rural areas where it is difficult to maintain villages due to the rapid depopulation and aging have been increasing [1]. In these areas, the functions of the village community have been lost, and the collapse of the Socio Ecological Production landscape which had been maintained by villagers has started [2, 3]. Socio Ecological Production landscape is dynamic mosaics of habitats and land uses where the harmonious interaction between people and nature maintains biodiversity while providing humans with the goods and services needed for their livelihoods, survival, and well-being in a sustainable manner [4]. Among them, regeneration of the socio ecological Production landscape in the area affected by serious environmental damage requires a strict risk management against various stigmas as well as the burden of restoring the environment.

Especially in Fukushima, six years have passed since the nuclear accident, and evacuation orders for about 32,000 people living in Namie, Iitate, Tomioka and Yamakiya District of Kawamata, has been lifted in March and April 2017 [5].

However, since the Socio Ecological Production landscape has lost, the lifting of this evacuation order will not lead directly to the return home of residents [6]. People in this area have been living by agriculture and forestry for a long time and it is indispensable to regenerate the socio ecological production landscape in order to restore the former life. The decontamination of forest is still a trial stage and it is a situation that the future concrete outlook is still not visible.

This research aims to explore the regeneration for Socio Ecological Production landscape in seriously environmental damaged rural area of Fukushima through the survey of prior efforts around the area. And we look into the ways of regenerating the Socio Ecological Production landscape, using interviews with local community representatives and field observation.

1.2 Fukushima Daiichi Accident and Residency Restriction

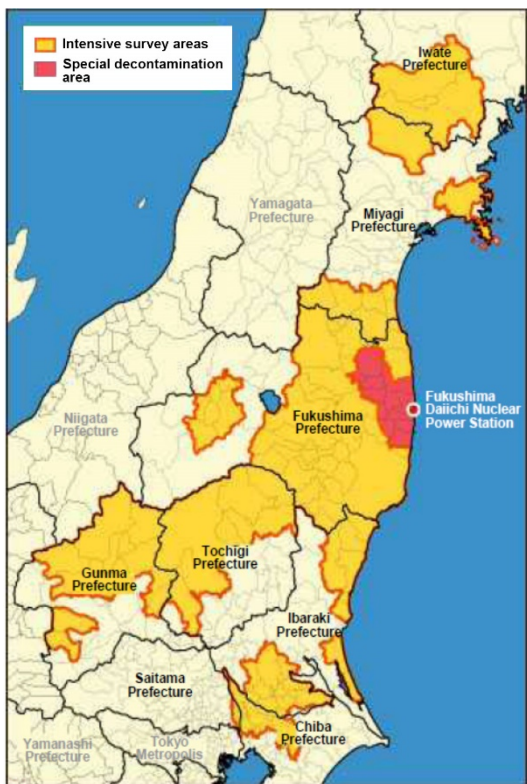


Fig.1 Designated areas in Special Measure Act for Radioactive Pollution in 2012 [7] (Courtesy Ministry of Environment)

The Great East Japan earthquake had occurred on March 11, 2011. The tsunami hit the Fukushima Daiichi Nuclear Power Plant (FDNPP) and it exploded. The radioactive pollutant from FDNPP had diffused widely in the surrounding area. 332,691 residents were forced to evacuate. To tackle this catastrophic event, the Special Measure Act for Radioactive Pollution came into force 2012. Two types of areas were designated in the Act which is Intensive Contamination Survey Areas (ISA) and Special Decontamination Areas (SDA). Figure 1 shows a map of ISA and SDA. ISA (under 20 mSv/y) shows yellow color in the map, which municipalities were obliged to implement decontamination. SDA (over 20 mSv/y) shows red color in the map, which the national government carries out decontamination. Left side map of Fig.2 is taking a close-up the SDA, within Red dot line, the area where residency is restricted or prohibited by the national government in 2012. Red color shows the zones (over 50mSv/y) where residency is prohibited for an extended period. Yellow color shows the zones (from more than 20mSv/y to less than 50mSv/y) where residency is restricted. Green color shows the zones (20mSv/y) where residents will be allowed to return after decontamination.

After six years from the disaster, decontamination work has progressed. On April 2017, residency restriction of 12 areas was lifted. They are shown as green color areas in Right side map of Fig.2.

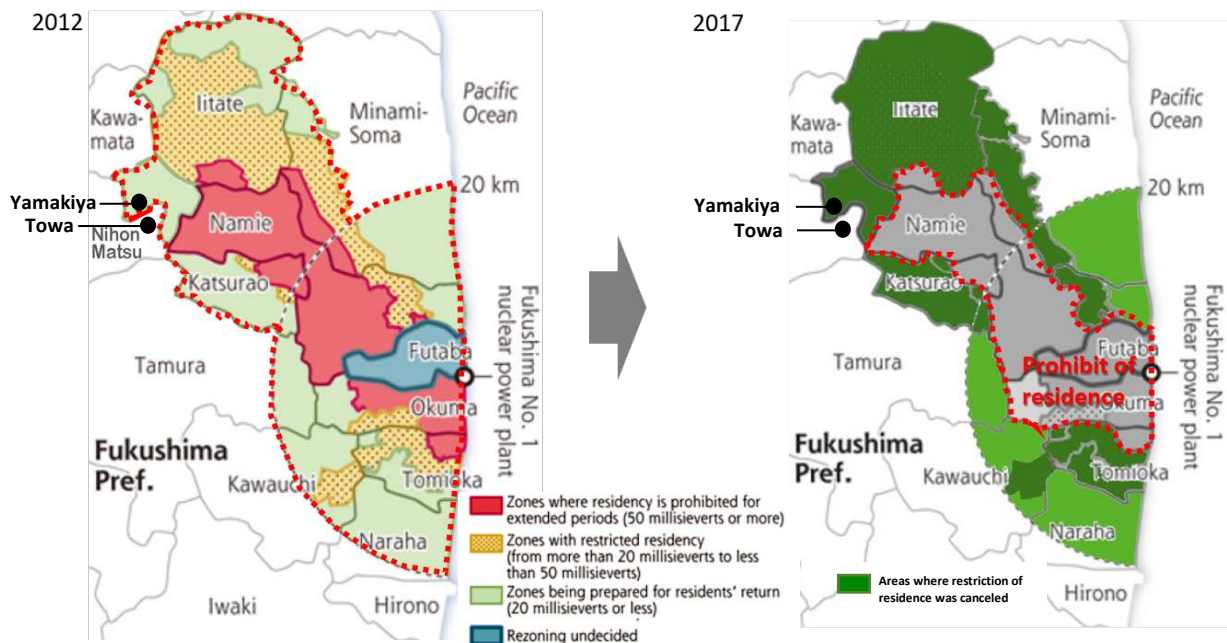


Fig.2 Change of SDA /left: Jan. 2012/ right: April 2017 (author edited the SDA map of Ministry of environment [5, 7])

The range of residency prohibits area (within the Red dot line) has decreased to one-third of the initial area. Also, the decontamination of the living area of a human being (areas within only 20 meter from the settlements) had been completed, and the residents of these areas could return to home. From now on, it is necessary to resume farming and to ensure security against radioactive contamination.

This paper aims to explore the regeneration for socio ecological production landscape in seriously environmentally damaged rural area of Fukushima through the field survey of prior efforts around the area. It will focus on two areas; the Yamakiya area and the Towa areas which are neighboring villages (See Fig.2). Yamakiya Area was located within the SDA. On the other hand, the Towa Area was located outside the SDA. Neither area was completely decontaminated, and the degree of contamination is not significantly different. However, residents in the Towa Area were allowed to return home and restarted agriculture soon after the nuclear disaster.

This paper will investigate leading activities in the Towa Area that have taken countermeasures against various social problems aiming for reconstruction which was located outside SDA despite the actual damage of radioactive contamination. We also aim to obtain knowledge for the regeneration of socio-ecological production landscapes in other rural areas.

Study methods used in this research are literature reviews and field survey regarding on current condition of the two villages and interviews with five representatives and young farmers of Towa area and Yamakiya area.

2. RESULTS AND DISCUSSIONS

This research investigated prior attempts in contaminated areas. We conducted an interview survey on representative people in both Areas. In fact, it appeared to be a gap of in their reconstruction in the two areas. Here, we show some noteworthy activities and initiatives in the Yamakiya area and the Towa area.

2.1 Towa Area

2.1.1 Current Condition

The changes in the population of Towa in Nihonmatsu City from 2000 to 2016 are shown in Fig.3. It was maintaining a gradual rate of descent from before the earthquake in Towa area. This is a common phenomenon in many mountainous areas in Japan. It can be seen that no significant population decline has occurred before and after the disaster. Also, because the Towa area was outside the evacuation instruction area, it can be

inferred that the community maintenance of the agricultural field was achieved in spite of the contamination. In the following results from the four interviews are presented.

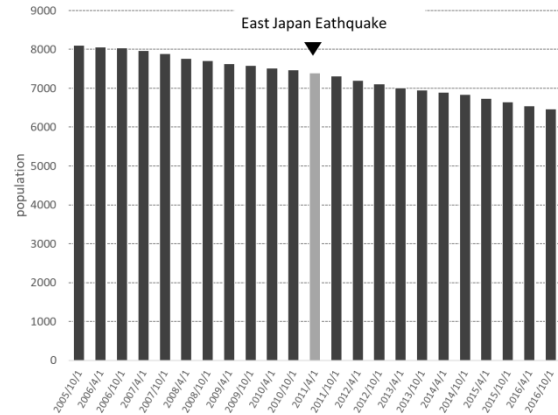


Fig.3 Changes in Population of the Towa in Nihonmatsu City/ 2000-2017 (Data of Nihonmatsu City [8])

2.1.2 Interview of a Young Farmer; Representative of Farm Company

Interviewee A is the representative of Farm Company. She is also one of the young farmers who decided to return to the TOWA area to continue parents' farming by organic cultivation. When she graduated from a university in Tokyo, the Great East Japan Earthquake occurred. She said that the Towa area was in a difficult situation, there was harmful rumor damage, and the workers were aging.

It is necessary to increase the number of people involved in the town, and to continue to increase the people who can work in the community maintenance of the town, by conveying the current situation to many people. And I believe that it is important what to produce a diversity of the number of people.

Therefore, she established the Farm Company. This company aims to get many people to be informed about the current situation of Fukushima through engaging in agricultural experience and farmer tour around the Towa area. Also, this company promotes organic cultivation of rice and vegetables, and web sales etc. She talked about the green tourism of the post-disaster;

I would like to focus on not only agriculture but also career building and education in the area. And, I would like to not only engage in the

framework of disaster reconstruction but also expand activities with people outside the region from now on.

Also, she talked about agriculture,

Although general agriculture has resumed, there are still harmful rumors regarding radioactive contamination. The number of farmers resumed is very small. Moreover, they are almost over 65 years old. Then, they can only last ten to twenty years if young farmers don't return.

Furthermore, she said about the future of the Towa area

*Even now, there is no change in the severe situation, but increasing the number of people involved in the town and communicating the situation of the town will be a solution to the problem. How many key person can connect the local person and the person who wish to immigrate here?
And I want to increase the number of people who can be active and create diversity.*

2.1.3 Interview of Representative of Fukushima Organic Agricultural Network

Interviewee B is the representative of Fukushima Organic Agricultural Network and Director of NPO Yuuki no Sato Towa Association (YSTA). He is also a person who is familiar with the process of reconstruction and promotion for agriculture in Towa Area. NPO YSTA was established in 2005 which has members of approximately 250 households, including local farmers who felt a sense of crisis when being marginalized during the 'Municipal Merger' by government Policy. After the disaster, the group was entrusted to the operation of the road side station 'Michi-no-Eki' from the city and acted as a base of activities on reconstruction. Local residents of this group have comprehensively undertaken various activities such as branding of local agricultural products, sixth industrialization (agricultural diversification), support of new farmers, and exchange with cities and green tourism etc.

The interview respondent talked about the road side station Fukushima Towa in his book published in 2012 [9].

We are positioning the station of the road as a base for local production and local consumption by small-quantity multipurpose agriculture centering mainly on vegetables and

upland field creation.

We also open a variety of events, and the office of NPO YSTA is also installed.

It is not only a function to sell products but also a place for joint activities in the area and a place to tackle the issue of community development..

'Satoyama Rebuilding Project' started from 2009 with the goal of regenerating local communities, farmlands, and forests. As an extension of the project, in August 2011 after the earthquake, 'Yuuki no Sato Towa Satoyama Rebirth Plan / Disaster Reconstruction Program' started. It was notable that the efforts of such a framework after the earthquake disaster and the restoration with a long-term perspective were carried out at an early stage.

He talked about the difference between the Towa area and the Yamakiya area.

There is a big difference between the Yamakiya area and the Towa area. One of them is a neighboring town guarantee system-being responsibility by Tokyo Electric Power Company. There was compensation of 100,000 yen per person in the Yamakiya area what is located inside the SDA, but no compensation was offered in the Towa area since it was outside of SDA.

The farmers in Towa had to start soon after the disaster without the compensation after the disaster in spite of under decontamination process.

2.1.4 Summary of the Towa Area

The findings in this section are summarised as follows.

1. It is necessary for the regeneration of environmentally damaged rural area to increase the number of people involved in the town, and to continue to increase the people who can work in the community maintenance of the town, by conveying the current situation to many people.
2. In the Towa area, there is a framework called NPO YSTA, this organization played a great role in comprehensively connecting people and towns.
3. It was notable that the efforts of such a framework after the earthquake disaster and the restoration with a long-term perspective by utilizing the government measures such as "Reconstruction Plan / Disaster Recovery Plan", were carried out at an early stage.

2.2 Yamakiya Area

2.2.1 Current Condition

The changes in the population of Yamakiya district in Kawamaya Town from 1995 to 2018 are shown in Fig.4. It was maintaining a gradual rate of descent from before the earthquake in the Yamakiya area.

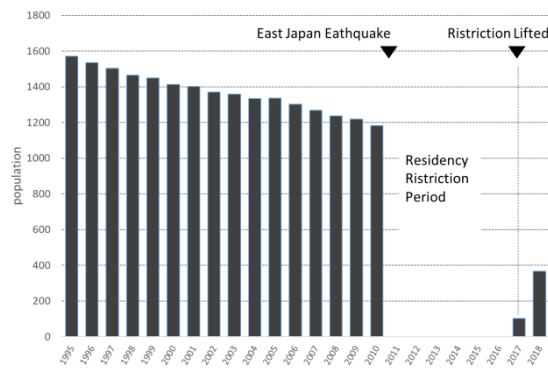


Fig.4 Changes in Population of Yamakiya/ 2000-2017 (Data of Town Council of Kawamata [10])

This is the same as Towa. However, from 2011 (after the disaster) to 2017 (until the lifting of the evacuation order), there was no resident. Even after the evacuation direction was canceled the number of residents was 100 in 2017, 300 in 2018, and only about 20% of the total residents had returned, and the number of evacuees still remains high in Yamakiya.

2.2.2 Interview of Young Farmer, member of Abukuma Cut Flower Group

Interviewee C is also one of the few young farmers who decided to return to the Yamakiya area. He would like to keep the community of Yamakiya by cultivating Turkey bellflower. And he is devoted to continuing the Abukuma Cut Flower Group (Fig.5).



Fig.5 Cultivating Turkey bellflower (Author's photo)

People in the Yamakiya area were forced to evacuate due to the disaster, cultivation was canceled in 2011 and 2012. After that, by utilizing the 'Fukushima Prefecture Farming Resumption Support Project' in 2013, we tried to demonstrate a good example of the cultivation of Turkey bellflower in the evacuation area, decontaminated agricultural land beforehand and carried out test cultivation. After completing the trial of cultivation, they planted seedlings in 2014, and 9450 bottles of flowers shipped. Overcoming the blank for three years, they are shipping high-quality Turkish bellflower. The interview respondent talked about the Community development

First of all, it is important that you can make a stable living as a farmer in the Yamakiya area. And I think that we can increase the number of members of this group

In addition, he suggested about a matter of the Yamakiya Area.

I heard that the number of people who are thinking of returning to Yamakiya will increase little by little.

However, the Yamakiya area originally had many elderly people, and from now on, it is predicted that the population of the town will decrease more, so the survival of local community maintenance like the association of neighborhood is a problem.

Also, I think that it is better to encourage revitalization as a commercial facility for "Tanya no Sato" as a reconstruction base facility.



Fig. 6 Tonya no Sato (Author's photo)

Tonya no Sato, one of the 'Michi-no-Eki' (Fig.6), is to be developed as a symbolic facility of reconstruction based on 'Plan for promoting

commercialization of the Yamakiya area restoration base (March 2015)'. It has been planned to contribute to the living support of people who returned home from evacuation, as a facility for people to gather and create bustling, and to revitalize local communities scattered by evacuation.

He talked about the decontamination

Radioactive contamination in Yamakiya area is not worrying too much, since there are some higher points of air dose rate in the Towa area outside of SDA higher than Yamakiya inside of SDA.

The grace of the mountains such as wild vegetables and mushrooms was familiar to people in the Yamakiya area long ago, but decontamination of Satoyama is a serious task, so I think that I do not have to force it.

2.2.3 Interview of Young Musician, Chairperson of the traditional performance group

Interviewee D is the leader of the traditional performance group. This group was formed in 2001 to raise reputation of the region with traditional drums that have been played for a long time at the summer festival in the Yamakiya Area. He suggested about a matter of Yamakiya Area.

The Yamakiya area is rich in nature, but the climate in winter is severe. Many people from Yamakiya work in Kawamata Town and Fukushima City.

Six years have passed since we evacuated, but many people still do not come back to the Yamakiya area. I hope that Yamakiya will become a place where they can come back at any time, even if I do not live in the Yamakiya area,

And, unless the Great East Japan Earthquake happens, there is a connection that was not born.

Many people have supported me, so I believe that I can give back them.

2.2.4 Interview of Chairperson of the Neighbourhood Farm Association of Yamakiya

Interviewee E is Vice Chairman of the Yamakiya Farm Association. He is a person who participated widely in activities, such as events and community dialogues as well as agriculture since the disaster.

He talked about the community.

There was a place point of time I was almost giving up as it is a disaster, but with the cancellation of the evacuation

order in the Yamakiya area, I had to think about what to do in the town. I tried to resume the living of the old Yamakiya area, but I could not see anything of the future vision. And I noticed that there was no human connection in this current area.

Furthermore, he raised a concern about the Yamakiya Area.

Although there is a strong belief among the people who have returned to the Yamakiya area now, there are many elderly people who do not have physical strength or energy and the problem is that the young generation does not return. There is a system of the central government that supports agriculture, but it is necessary to plan things ahead for years and there is anxiety as to whether or not to continue. I think that it is good to create places other than agriculture where we can do what we can do.

2.2.5 Summary of the Yamakiya area

The findings in this section are summarized as follows.

1. Various activities and efforts at Yamakiya have a big role in reconstruction. Each activity contains a strong intention for the revitalization of the town. However, in the current Yamakiya area, there is no organizational structure that strongly connects residents, each of which remains independent activities.
2. The current situation of Yamakiya and the Towa areas which are neighboring towns presented a big difference by the division caused by the administrative boundary of inside or outside SDA. This contrasting recovery process was a negative effect on community revitalization because this is a typical administrative division caused by the central government's policy. It seems that a more flexible approach to designating SDA is needed.

3. CONCLUSIONS

In this research, we examined the activities in two contrasting areas in Fukushima. Results are as follows.

1. Various activities and efforts at Yamakiya played a critical role in reconstruction. Each activity contains a strong intention for the

revitalization of the town. However, In the Yamakiya area, there is no public organization system that strongly connects residents, and each follows currently an independent activity. On the other hand, in the Towa area, there is a framework called NPO YSTA which gives a framework for comprehensively connecting people and towns.

2. The current situation of the Yamakiya and the neighboring Towa area had a big difference caused by administrative division by the government's policy on evacuation order. This contrasting recovery process was a negative effect on the community redevelopment. It seems that a more flexible approach for designating SDA is needed.
3. It is necessary for the Yamakiya Area to increase the number of people involved in the rebuilding of the town, and to continue to support the people who can work in the community maintenance of the town, by disseminating the current situation to many people. The role of rural tourism is important as in the Towa Area important.
4. It should be noteworthy that the efforts in anticipation of such a framework after the earthquake disaster and the restoration with a long-term perspective by utilizing the government measures such as "Reconstruction Plan / Disaster Recovery Plan", were carried out at an early stage in the Towa Area.

The challenge is how to restore people's former life that was based on agriculture and forestry and this research looked into the ways of regenerating the socio ecological production landscape, using interview with local community representatives and field observation. The case study has revealed that the decontamination of the forest is still in a trial stage and the key obstacle is the fact that there are still a few people who wish to return because the future concrete outlook is still not visible. However, a new community has been gradually generating through an approach which some farmers resume farming with external researchers and volunteers who are interested in the regeneration. It seems to be lead to the potential for regeneration of the socio-ecological production landscape.

4. ACKNOWLEDGMENTS

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