

Paper:

Are Cash for Work (CFW) Programs Effective to Promote Disaster Recovery? Evidence from the Case of Fukushima Prefecture

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This paper aims to evaluate CFW programs as a disaster recovery policy tool in terms of the psychological aspects, using the questionnaire survey data of 897 participants in Fukushima Prefecture. The main findings are as follows: those who “want to contribute to the reconstruction of Fukushima,” “to newly acquire experience or skills” and “have access to trainer or instructor” significantly felt being “connected” and thought “positively” to the future. Interestingly, evacuees as a group generally had positive views for the future. The primary conclusion is that CFW has been successfully targeted to a vulnerable group, and has a psychologically positive impact on the participants, and especially on the evacuees.

Keywords: disaster resilience, recovery, livelihood, job generation, Cash for Work

1. Introduction

Cash for Work (CFW) is a method of employing disaster victims in various kinds of work that occur in the process of response, reconstruction and recovery from disaster, and paying them cash as a method to support disaster victims. CFW was developed in the field of international humanitarian assistance, and is still used today in developing countries at sites that are recovering from disasters or conflicts. Well-known examples include the CFW program implemented at Banda Aceh by non-governmental organizations such as the Mercy Corps in the reconstruction process from the large-scale Indian Ocean tsunami of 2004 [1], or the program carried out by international organizations such as the United Nations Development Plan (UNDP) and United States Agency for International Development (USAID), and governmental organizations in the reconstruction process of the 2010 Haiti Earthquake [2].

This paper discusses the CFW program implemented in the reconstruction process following the 2011 Great East Japan Earthquake disasters, and quantitatively evaluates its effect through questionnaire results obtained from participants of the Kizuna (ties) Program carried out in Fukushima Prefecture.

The paper consists of the following contents. Section 2 introduces prior studies on CFW programs, providing an overview of their history, definition, and significance. In Section 3, we describe the CFW program carried out following the Great East Japan Earthquake disasters. Section 4 gives an overview of the questionnaire survey carried out against participants of the CFW program (Kizuna project) implemented by Fukushima Prefecture, and Section 5 empirically examines what kind of psychological effects the program had on the participants. The conclusion is presented in Section 6.

2. What is CFW?

2.1. History of CFW

CFW programs originated as an alternative to the Food for Work (FFW) schemes. FFW programs are those that employ refugees produced by famine and damage caused by wind or flood in the Sub Sahara region as laborers for infrastructure reconstruction, etc., and in exchange provide them with food.

Subsequently, it came to be recognized that there are cases in which providing support by cash may be better than food assistance. For one thing, the cost of handling is lower with cash rather than food, secondly, the disaster victim is able to purchase what he or she needs, not just only food, so that the welfare level is higher, and thirdly, the provision of cash creates a demand within the regional economy, and thus serves to speed up economic recovery [3]. Due to this growing recognition, CFW programs have been increasingly implemented in the field of humanitarian aid in developing countries.

The advantages of CFW programs can be summed up into following five categories.

First, they provide disaster victims with opportunities for obtaining income and contribute to empowering those victims. Obtaining an income through one's own labor is an important factor for disaster victims to become self-supporting and have dignity [4].

Second, the work done by disaster victims promotes the recovery and reconstruction of the disaster-hit community. By setting work as a condition, rather than extending unconditional cash transfer, the work thus obtained can



help to promote recovery of the disaster-hit areas [5].

Third, CFW programs encourage disaster victims to participate and unite together in reconstruction efforts. When disaster victims become directly involved in the reconstruction of the areas in which they had lived, it is believed that the community itself is strengthened [1].

Fourth, CFW programs stimulate recovery of the local economy. It is believed that, when the disaster victims are provided with cash, the money circulates within the disaster-hit area, and promotes economic recovery [1, 4].

Fifth, CFW programs encourage self-targeting. With unconditional donations such as charity funds, people who are not necessarily in need will also try to receive them. If the cash support is provided in exchange for labor, however, those not in need are less likely to participate in the program. Thus, it is believed that the limited resources available for relief efforts can be channeled to those actually in need of support. In this connection, it is recommended that the wages provided by CFW programs be set at a level 10-20% lower than that during normal times [1]. It is also recommended that CFW programs be terminated as soon as normal economic activities are resumed. The reason for this is that CFW programs are a means specifically designed to create employment in the short run, and not to be continued over a long period, i.e., they are considered as an emergency measure. For instance, the CFW programs implemented in Aceh after the 2004 Indian Ocean tsunami [6] and during the reconstruction program after Cyclone Nargis in 2008 by the Myanmar Red Cross Society [5] were both terminated about a year after the disaster.

2.2. Prior Studies on the Effects of CFW Programs

Doocy et al. [6] have conducted an empirical study on the effects of CFW programs in disaster reconstruction. Their findings suggested that self targeting was functioning in the CFW program conducted in Banda Aceh, which was hit by the 2004 Indian Ocean tsunami. They showed that the CFW program was the only source of income for most of the participants, and that on average 93% of the income of participants came from the CFW program. Furthermore, 91% of the survey sample indicated that CFW helped to facilitate return to their communities. They also found that the CFW program provided disaster victims with an opportunity to participate in the reconstruction process, and promoted cooperative community work.

Meanwhile, Echevin et al. [7] found in their study of the CFW program in Haiti empirical evidence that was quite contrasting. They found that the CFW program was not reaching the poorest stratum which had the most need, that the participants were those who had lost the least farm assets, and that households whose main income earner was a female member were least likely to participate in CFW. Thus, they had so negative conclusion on CFW that they instead recommended considering the feasibility of unconditional distribution of cash to all households immediately after a disaster.

3. Job Creation Program by the Government After the Great East Japan Earthquake and Tsunami

3.1. Employment Policy Measures by the Government

Immediately following the Great East Japan Earthquake disasters, many businesses were directly affected by the disaster, lay-offed a large number of workers. According to a private think tank, this number was estimated to be as high as 200,000 people. The Japanese government implemented the following three categories of measures to deal with the unemployment resulting from the disasters.

First, it allotted more funds to increase employment adjustment subsidies. These are governmental subsidies that cover one-half to one-third of the salary paid to the workers, and are a protective measure for the workers not to be discharged. Second, the government implemented special measures on employment insurance. This included extending the period of unemployment payments to disaster victims who had lost their jobs forcibly. Third, the government applied the emergency job creation project. This provided funds for local governments and private businesses to employ disaster victims who had lost their jobs, in work that was related to disaster response, recovery, and reconstruction.

The first and second measures had been implemented after the Great Hanshin-Awaji Earthquake, but the third measure, namely, "the emergency job creation program," in which the government set up job creation funds that enable the local government to directly hire disaster victims, was a step previously not undertaken by the government¹. The number of employed people in the three prefectures struck by the disaster (Iwate, Miyagi, and Fukushima) up to fiscal 2012 amounted to 65,729 people, which was about 20% of the new employment in the three prefectures during the same period.

The emergency job creation program served an extremely important role for local entities, such as local governments, NPOs, NGOs and private businesses, being engaged in activities to support reconstruction. The program was not only to maintain the employment of disaster victims, but also financially sustain the local entities during the post-disaster reconstruction process, mobilizing the unemployed into various types of victim relief work which had not existed previously had been created by the disaster, and it had no longer become possible for existing administrative bodies and relief groups to handle this work on their own. Examples of such work newly created by the disaster or as responses to the nuclear plant accident included providing support to residents of refuge and temporary housing, and conducting radiation monitoring.

1. A summary of employment measures implemented after the Great Hanshin-Awaji Earthquake is presented in a report by the Japan Institute for Labour Policy and Training [8].

3.2. Kizuna (Ties) Project Implemented by Fukushima Prefecture

In Fukushima Prefecture, the area within a 20-kilometer radius of the Fukushima Daiichi Nuclear Power Station, the site of the accident, was designated as an evacuation zone, and another area which has a particularly high radiation dosage was designated as a planned evacuation zone. These zones are indicated by the striped areas in **Fig. 1**. The population that had lived in the evacuation zone was about 81,300, of which 58,589 have evacuated to locations within Fukushima Prefecture. Many evacuees lost their jobs and their sources of income. Since so many evacuated people were living in various locations within the prefecture, there arose a great need to provide support for their livelihoods.

To this end, the Fukushima prefectural government implemented the Kizuna project, taking advantage of the job creation fund². This is a project which aims at “building up ties among evacuees and with local residents by strengthening the operational system of temporary housing, and providing economic assistance through employment to evacuees and those who had lost their jobs,” according to Fukushima prefectural government. The actual operation entails not just the management of temporary housing, etc., but covers a wide range of activities including administrative work and management of events.

The Kizuna project is perhaps the largest single funded project implemented for the purpose of disaster victim relief. For instance, there were 52,624 newly employed people in Fukushima Prefecture in fiscal 2011, of which 14,260 were under the emergency job program. Of those, 5,855 were employed under the Kizuna project.

Under the Kizuna project, Fukushima Prefecture is divided into six blocks, as shown in **Fig. 1**, in each of which a single private staffing agency is subcontracted to hire a certain number of the affected unemployed. The Employment and Labor Relations Section of the Fukushima prefectural government issues directives on assistance to the designated private staffing agency, upon an assistance request from other sections of the prefectural government or local municipalities that were struck by the disaster. The agency then hires the affected unemployed to carry out the requested operation on behalf of the party that made the request. Under this scheme, the affected unemployed is hired by the staffing agency and works under its directions.

3.3. Features of the Kizuna Project as a CFW Program

The job creation funding program, through which the Kizuna project receives funding, has been created as an unemployment measure since before the Great East Japan Earthquake struck, and so is a policy implementation that occurred in an entirely different context to that of CFWs. Yet, the policy is designed to offer work that occurs in

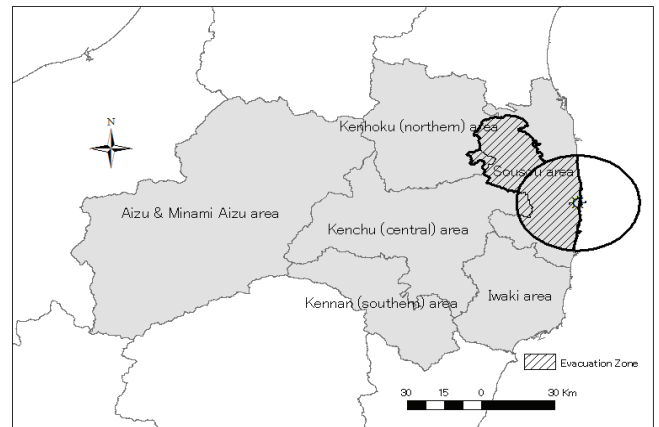


Fig. 1. Six areas under jurisdiction of the Kizuna project and evacuation zones.

the process of post-disaster reconstruction to the disaster victims and in this manner attempts to empower those victims, and in this regard is thus quite similar to CFW programs [10, 11].

The job creation funding program does not, however, make an attempt to keep wages at a level lower than the prevailing job market. In other words, there is no intent to induce self-targeting, which is a feature of CFW. In this sense, it cannot be called a typical CFW program. There have been CFW programs, however, in which the participants are chosen through community dialogue [5] rather than self targeting. So the emergency job creation program can be considered to fall under CFW, in the sense that it is targeted at the unemployed, who make up a vulnerable social. Furthermore, since a major objective of the Kizuna project is to unite communities, it can be said to overlap with CFWs in this regard as well.

Incidentally, programs similar to CFWs have been implemented in industrialized countries as well, although they are not normally categorized as such. For instance, the Federal Emergency Management Agency (FEMA) of the United States sponsors a program called the local hire program, under which disaster victims are employed locally. Although the upper limit of the employment period is 120 days, which differs from the Kizuna project, the intent can be considered to be in agreement with the CFW concept.

4. Analysis of the Effect of the Kizuna Project as a CFW Program

4.1. Description of Data

The data used for analysis is based on a questionnaire survey conducted against participants of the Kizuna project, with cooperation from the Employment and Labor Relations Section of the Fukushima prefectural government and the employment support agencies that carry out the operations [12]. The questions can be categorized under those falling under A) individual attributes,

2. The overall scheme of the Kizuna project is described in detail in Hashimoto [9].

Table 1. Time period of survey and number of collected questionnaire results.

Area	Survey period (in 2012)	No. of Target participants (A)	No. of respondents (B)	Rate (B/A) (percent)
Aizu and Minami Aizu area	Apr. 4-13	120	101	84.2%
Kenhoku (northern) area	Apr. 2-27	300	206	68.7%
Kenchu (central) area	Mar. 30-Apr. 19	351	346	98.6%
Iwaki area	Apr. 2-16	142	110	77.5%
Sousou area	Apr. 18-21	80	48	60.0%
Kennan (southern) area	Mar. 30-Apr. 20	140	83	59.3%
Total		1133	894	78.9%

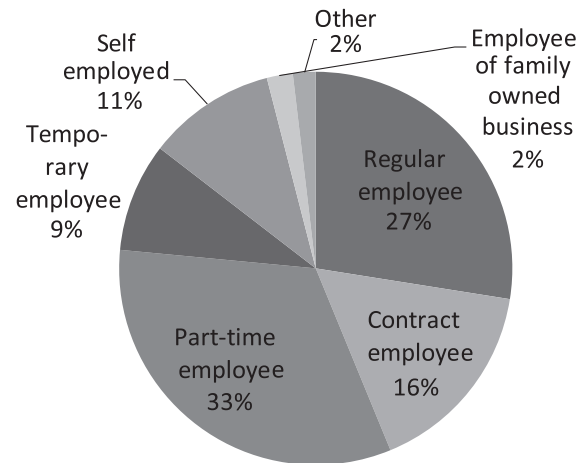
B) evacuation conditions, C) work prior to the Great East Japan Earthquake, and D) work under the Kizuna project. In each of the six blocks of Fukushima Prefecture (Aizu and Minami Aizu, Kenhoku (northern), Kenchu (central), Iwaki, Sousou, and Kennan (southern)), the subcontracted staffing agencies directly distributed the questionnaires to all participants who were working under the Kizuna project at the time of this survey, and then collected the responses. The filled questionnaires were received and placed in envelopes, so as to protect the respondents' anonymity. **Table 1** presents the number of target participants, the number responded, and the collection rate. The average rate was 78.9%, while it differs for each block.

It should be noted that the results represent those when about one year had passed since the Great East Japan Earthquake, and is not a representation of the all participants from the entire operational period of the Kizuna project. The Kizuna project was started in August, 2011, and is being continued as of January, 2014. The questionnaire consisted of nine questions on the respondents' attributes, two on their lives as evacuees, five on their jobs prior to the earthquake and tsunami disaster and 19 on their employment by the Kizuna project.

4.2. Characteristics of Program Participants

Targeting successful to some extent in the Kizuna project

What kind of people are employed in the Kizuna project? In terms of the work prior to the Great East Japan Earthquake, only 27% had been working as regular employees (**Fig. 2**). According to the "General Survey on Diversified Types of Employment" of 2011, regular employees make up 61.3% of the total working population, so we can see in comparison that the overwhelming majority of those employed by the Kizuna project are non-regular employees. "Laborers" (i.e., consisting of regular employees, contract workers, part-time employees, and temporary employees) make up 85.4% of the total number of participants (i.e., those who responded to the questionnaire), which is somewhat lower than 87.0%, the figure given for Japan in the August 2012 Labor Force Survey, Statistics Bureau, Ministry of Internal Affairs and Communications, but the difference is minor. When the area in which the participant lived prior to the East Japan Earthquake is cross-tabulated, however, this figure falls to

**Fig. 2.** Employment prior to East Japan Earthquake ($N = 894$).

70.8% for the Sousou area. Thus, it can be seen that the majority of those working under the Kizuna project are those who had a relatively vulnerable employment environment rather than regular employees, who are assured of receiving employment insurance benefits³.

Meanwhile, about 40% of the participants stated that they were the highest income earner in their respective households, indicating that they were the main household supporters (**Fig. 3**). For these people, at least, it is likely that it would be difficult to support their households without the income from the Kizuna project.

Of those people employed by the Kizuna project who had lost their previous jobs at companies and businesses, 37.0% stated that they had lost their jobs for "company reasons (related to the disasters)"; including "their own reasons (related to the disasters)," 57.5% lost their jobs due to the disasters (**Fig. 4**). Meanwhile, of those who had previously been self-employed or had engaged in freelance work, 61.9% stated that "it had become difficult to continue my work because I had been forced to evacuate

3. Following the Great East Japan Earthquake disasters, the special extension of the benefit period (of unemployment insurance) for individual cases, which is 60 days in principle, was further extended by 60 days as a preferential measure, in those cases when disaster victims who had lost their jobs found it difficult to find employment. Beginning on October 1, 2011, a further extension of 90 days was applied to the coastal areas of the three disaster-struck prefectures, since the employment situation in those areas remained severe.

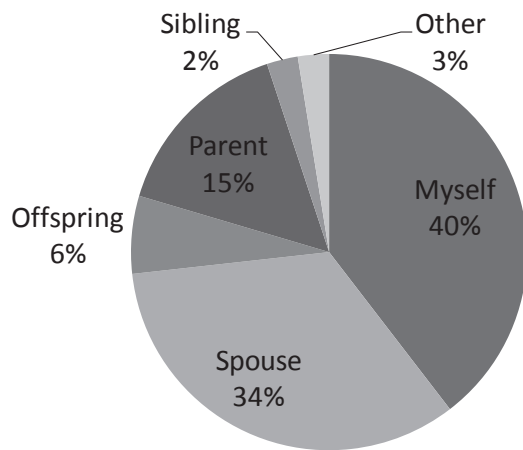


Fig. 3. Highest income earner of household currently ($N = 894$).

by the earthquake or tsunami,” indicating that the earthquake and tsunami disaster was clearly the cause.

From these responses, we can infer that many people who had been unemployed prior to the Great East Japan Earthquake were being employed. Still, over half of the participants stated that they had lost their jobs due to the disaster. Thus, we can state that the Kizuna project, as a CFW program, had achieved a measure of success in targeting those vulnerable social strata.

Participants of the Kizuna project include many evacuees of the nuclear plant accident

How many evacuees of nuclear plant accident are in fact included in those employed by the Kizuna project?

The evacuees are expected to have a high need for short-term employment programs such as CFW programs, since many evacuees of the nuclear plant accident were relocated to distant areas, and find it difficult to make future plans. On the other hand, those who had been forced to evacuate by orders receive monthly compensation from Tokyo Electric Co., so that their need to find employment to earn an income is lower than other disaster victims.

In this survey, we found that 33.7% of the participants live as evacuees (**Fig. 5**). Virtually all of them can be considered to be evacuees from the nuclear plant accident. Based on another estimation, evacuees from the nuclear plant accident were found to make up 26.8% of the total unemployed population (see Appendix).

This indicates that there is a relatively high number of evacuees from the nuclear plant accident among the participants of the Kizuna project. Their reason for participation, however, is not because they are economically in dire straits. We believe that emotional factors are the major reason, as we shall see later.

Many types of work are offered in the Kizuna project

Many of the CFW programs implemented in developing countries employ people in manual labor such as the removal of rubble or reconstruction of infrastructure. In contrast, the Kizuna project was set up to employ people mainly in light duties, such as life support activities

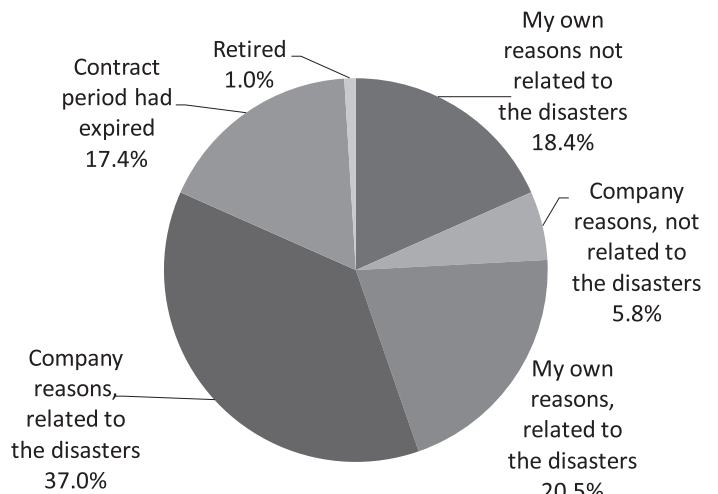


Fig. 4. Reason why respondent was unable to continue previous work ($N = 414$).

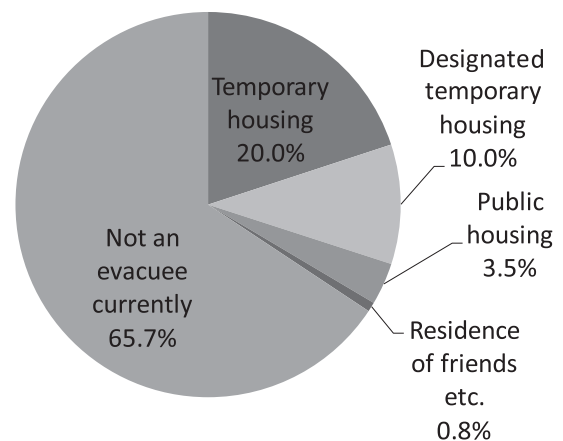


Fig. 5. Evacuee status and location ($N = 877$).

for temporary housing, and the survey found that disaster victims were employed to a wide range of work, including office work, community support, and radiation monitoring (**Fig. 6**). Furthermore, 63.8% of the respondents stated that their previous employment experience was useful to some extent (“Very helpful” and “Helpful to some extent”) in their current work assignments (**Fig. 7**).

The work assignments given in the Kizuna project do not all involve routine tasks. Only 19.5% of the respondents stated that they engaged in “mostly routine work that must be carried out as directed” (**Fig. 8**). With regard to the amount of work, responsibility given, and wage level, about 60% stated that they were “appropriate” (**Fig. 9**). However, over half of the men aged 59 and below stated that the wage was “low.”

In sum, disaster affected unemployed are engaged in various types of work and occupations in the Kizuna project, and over 60% of the participants stated that their previous employment experience was helpful. While there was a range in the amount of judgment allowed by and responsibility given to workers, some 60% stated that they were “appropriate,” showing that more than half of

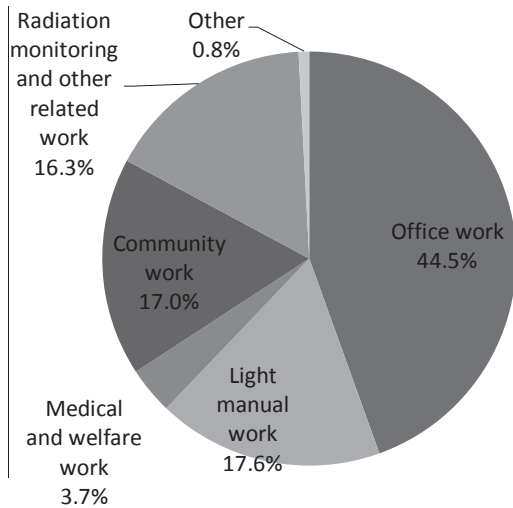


Fig. 6. Types of work assignment in the Kizuna project ($N = 845$).

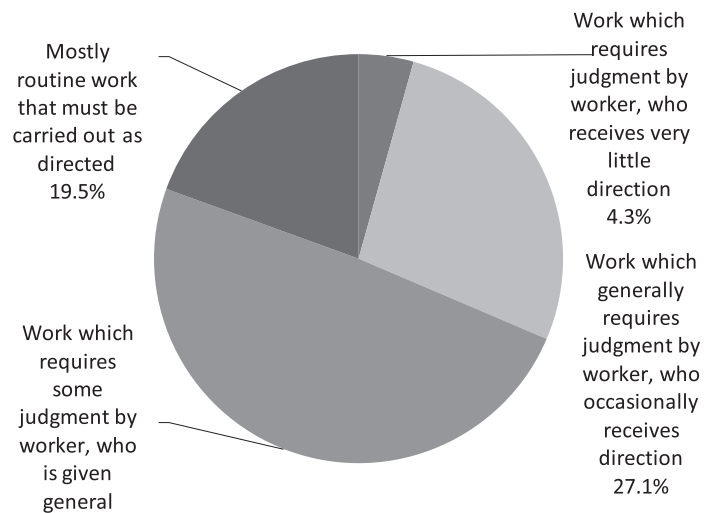


Fig. 8. Amount of judgment required in work ($N = 853$).

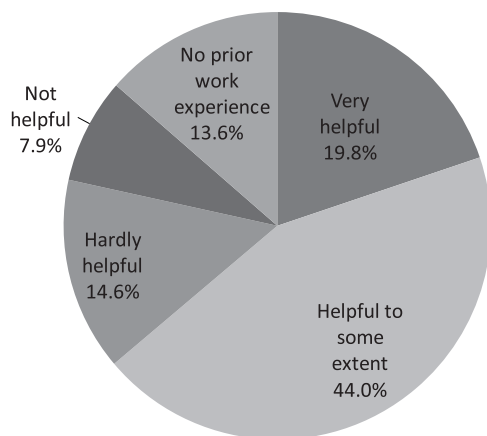


Fig. 7. Work experience prior to Great East Japan Earthquake ($N = 868$).

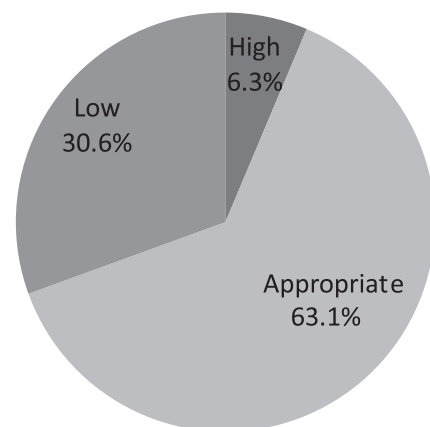


Fig. 9. Wage level ($N = 851$).

the participants were employed in work in which their abilities were useful.

5. Quantitative Analysis of Emotional Satisfaction of Participants in Kizuna Project

5.1. Participants' Subjective Evaluation of Kizuna Project

The questionnaire included 14 questions on the satisfaction level in their work and their subjective evaluations, in addition to individual attributes, background and type of work the participant engages in. The respondent answers the questions on a five-level Likert scale. The questions were formulated to especially address the emotional effects, based on the effects of CFW pointed out in prior studies cited in Section 2. The questions and the summed responses are presented in **Fig. 10**. Generally speaking, many participants of the Kizuna project have gained emotional satisfaction through their work. Over half of the participants gave a positive response to questions such as “1. My sense of solidarity with other disaster victims has grown,” “2. I have become more attached to Fukushima.” and “4. The work has given me hope for the future,” indicating that, generally speaking, many participants of the Kizuna project have gained emotional satisfaction through their work. However, the responses to questions such as “5. Temporary housing complexes and local communities which receive support through my work have become vitalized.” and “10. The Kizuna project is successful in tying up with local self-initiatives such as neighborhood associations and local self-governing bodies.” are not so affirmative, suggesting that the Kizuna project may not be so successful in its goal of “building up ties among evacuees and with local residents.” In the rest of the paper, we shall call the level of personal satisfaction or the subjective evaluation regarding one's work “emotional satisfaction.”

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5.2. Dependent Variable: Emotional Satisfaction Factor of Participants

In this and the following sections, those factors that underlie the emotional satisfaction of the project employees are examined using multiple regression analysis.

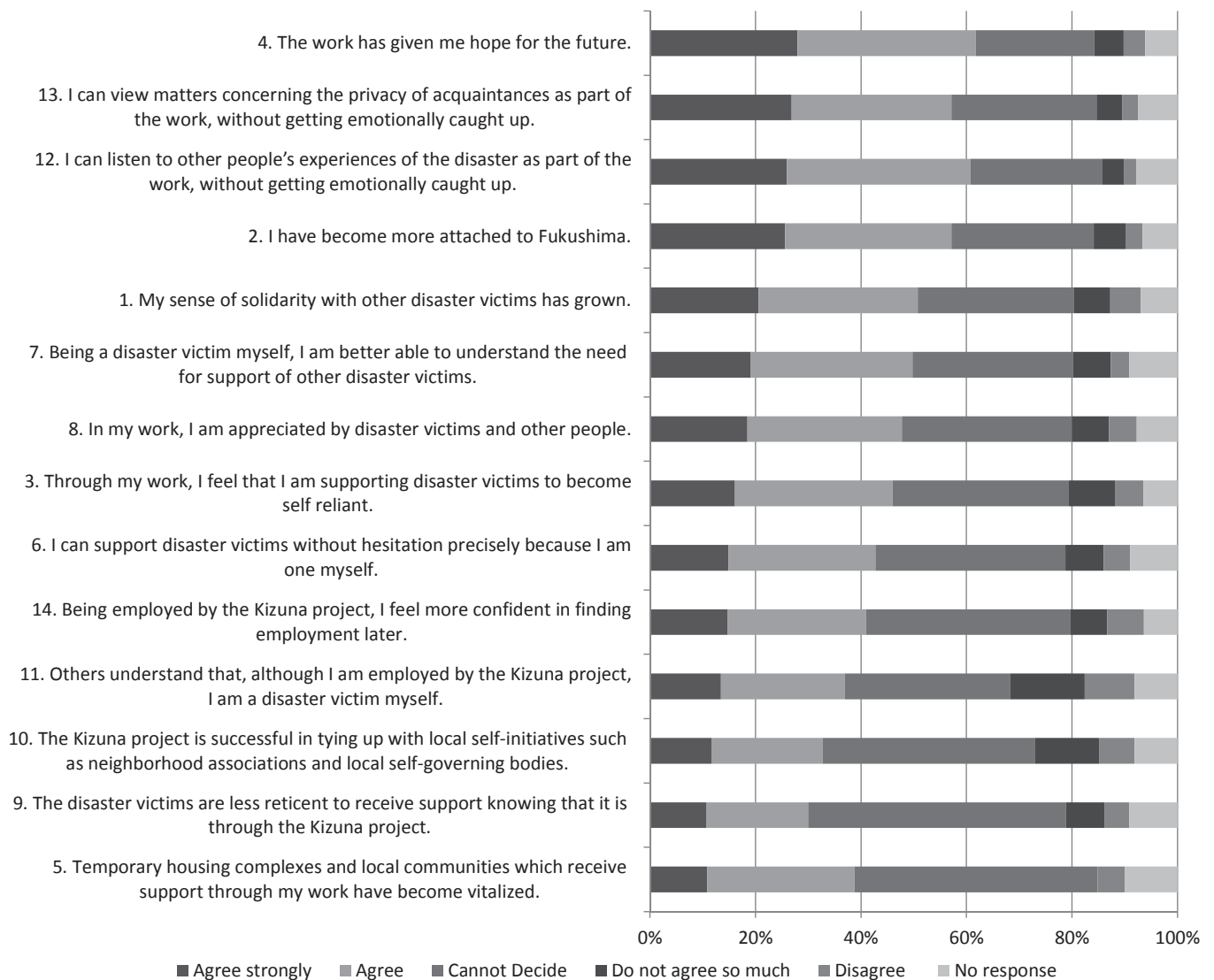


Fig. 10. Participants' emotional satisfaction with Kizuna project ($N = 894$).

We need to set up, as the dependent variables, quantitative variables that indicate the level of emotional satisfaction of the respondents from the Kizuna project. To this end, we carried out factor analysis of the 14 questions described earlier, in order to extract the common factors in the responses. Extraction was done using the principal factor method, and promax rotation carried out assuming inter-factor correlations. Those questions which had a factor loading under 0.4 for all factors were deleted, after which analysis was repeated. Those factors with a factor loading that do not exceed 0.4 against three or more questions were not used, and the analysis repeated by removing the question item. As a result, we were able to obtain the simple structure presented in **Table 2**, where two factors were extracted.

For the first factor, we interpret it as "connectedness." Since questions which had a high factor loading were, "my sense of solidarity with other disaster victims has grown," it has led to "temporary housing complexes and local communities which receive support through my work have become vitalized," and "successful in tying up

with neighborhood associations and local self-governing bodies," which can be interpreted as positive evaluations regarding the Kizuna project's role in promoting a sense of "connectedness" among disaster victims. Furthermore, the questions "I can support disaster victims without hesitation precisely because I am one myself" and "being a disaster victim myself, I am better able to understand the need for support of other disaster victims" also can be considered as evaluations on "connectedness" since the effective implementation of support work is promoted by the fact that the project participant and recipients of support are both disaster victims. For these reasons, the first factor shall be called "connectedness."

We also interpret the second factor as "positivity." While the "connectedness" factor focuses on the relationship between disaster victims or between the program participant and disaster victims, the second factor had a high factor loading with respect to items such as "I have become more attached to Fukushima," "Through my work, I feel that I am supporting disaster victims to become self reliant," "Being employed by the Kizuna project, I feel

Table 2. Result of factor analysis regarding emotional satisfaction.

	Factors	
	Connectedness ($\alpha = .884$)	Positivity ($\alpha = .784$)
11. Others understand that, although I am employed by the Kizuna project, I am a disaster victim myself.	.765	-.197
6. I can support disaster victims without hesitation precisely because I am one myself.	.724	.122
10. The Kizuna project is successful in tying up with local self-initiatives such as neighborhood associations and local self-governing bodies.	.718	-.018
8. In my work, I am appreciated by disaster victims and other people.	.714	.023
7. Being a disaster victim myself, I am better able to understand the need for support of other disaster victims.	.674	.134
1. My sense of solidarity with other disaster victims has grown.	.546	.213
5. Temporary housing complexes and local communities which receive support through my work have become vitalized.	.514	.289
4. The work has given me hope for the future.	-.252	.988
14. Being employed by the Kizuna project, I feel more confident in finding employment later.	.165	.538
2. I have become more attached to Fukushima.	.227	.496
3. Through my work, I feel that I am supporting disaster victims to become self reliant.	.263	.465
Eigenvalue	5.71	1.03
Factor contribution rate	51.90	9.35

Factor extraction method: principal factor method
Rotation method: promax with Kaiser normalization

more confident in finding employment later,” and “The work has given me hope for the future,” which concern the positive changes taking place in the minds of the disaster victim or support-provider. Therefore, we shall henceforth call the second factor “positivity.”

Note that the sign (+/−) of these factor scores are reversed when they are used as variables in the regression analysis, so that the higher factor score represents the high level of “connectedness” or “positivity.”

5.3. Variables Used

By computing the factor scores from the results of **Table 2**, we can determine the level of “connectedness” or “positivity” the respondent felt from his or her work. In this section, we carry out regression analysis using the explanatory variables listed below in order to identify those variables that can explain these factors. The descriptive statistics of all variables, including the explained variables, are presented in **Table 3**. The table also presents the test statistics of the difference in the average values between those who had undergone evacuation and those who had not, for the analysis described later.

(a) Variables related to individual attributes

Binary dummy variables were used for nominal scale variables. The “gender dummy” is a variable that is 1 for male, 0 for female. “Age” is the respondent’s age as of April 1, 2012, rather than the birth date. The “university graduate dummy” is a dummy variable that is 1 when the respondent is a university graduate or has a higher degree,

and 0 for others. The “main income earner dummy” is 1 when the respondent has the highest income in his/her household, and 0 when otherwise. The “lost job for company reasons due to the earthquake or tsunami” dummy is 1 when the respondent had lost his/her previous job due to company reasons arising from the disaster, and 0 when otherwise. “Evacuation or not” is 1 when the respondent had evacuated from his/her previous home and was living as an evacuee whatever the current living situation was, whether temporary housing or living in a relative’s house, and 0 otherwise. The “regular employee dummy” is 1 when the respondent who had been employed at the time of the earthquake and tsunami disaster was a regular employee, and 0 when otherwise. Similarly, the “self-employed, employed by family business dummy” is 1 when the respondent had been self-employed (including work in fishing industry), engaged in freelance work, or employed by his or her family business, and 0 when otherwise.

(b) Variables related to reasons for participating Kizuna project

These are dummy variables that take on the value 1 whenever the given reason applies, concerning the reasons for participating in the Kizuna project.

(c) Area dummy variable

These are dummy variables that express the area (area applies = 1, other = 0) in which the respondent was employed in the Kizuna project. The areas of evacuees do

Table 3. Descriptive statistics of variables and difference of average values depending on evacuation experience ($N = 690$).

		Average			T-stat.	Std. dev.
		Total	No Evac.	Evac.		
	Connectedness	-0.014	-0.208	0.328	<i>7.114***</i>	0.925
	Positivity	-0.029	-0.054	0.066	<i>1.604</i>	0.491
Individual attributes	Gender dummy (male=1, female=0)	0.404	0.362	0.489	<i>3.219***</i>	12.737
	Age	44.864	42.451	49.658	<i>7.014***</i>	0.463
	University graduate dummy (graduated university or above=1, other =0)	0.312	0.355	0.225	<i>3.477***</i>	0.484
	Main income earner dummy	0.372	0.316	0.485	<i>4.329***</i>	0.379
	“Lost job for company reasons due to the earthquake or tsunami” dummy	0.174	0.120	0.281	<i>5.280***</i>	0.472
	Evacuation or not	0.335				0.431
	Regular employee dummy (regular employee before disaster =1, other=0)	0.246	0.240	0.260	<i>0.577</i>	0.298
	“Self-employed, employed by family business” dummy (employed by family business before disaster =1, other=0)	0.099	0.037	0.221	<i>7.636***</i>	0.483
Reasons for participation	1. Because I wanted to contribute to the reconstruction of Fukushima	0.371	0.418	0.277	<i>3.622***</i>	0.435
	2. Because I could make use of my previous experience or skills	0.254	0.275	0.212	<i>1.776*</i>	0.414
	3. To newly acquire experience or skills	0.219	0.259	0.139	<i>3.617***</i>	0.361
	4. Because recruitment was quick and it was convenient.	0.154	0.161	0.139	<i>0.780</i>	0.361
	5. Because I could maintain my private life (housekeeping, nursing care, child-rearing, etc.) while working at the same time.	0.154	0.157	0.147	<i>0.332</i>	0.500
	6. Because I needed an income.	0.471	0.486	0.442	<i>1.099</i>	0.417
	7. Work conditions such as wages were better than other work.	0.223	0.272	0.126	<i>4.367***</i>	0.418
	8. Because I could receive social insurance, etc.	0.225	0.246	0.182	<i>1.911*</i>	0.223
	9. Because my unemployment benefits had expired or was about to expire.	0.052	0.061	0.035	<i>1.469</i>	0.489
	10. Because I could work close to home.	0.394	0.399	0.385	<i>0.340</i>	0.452
	11. Because it was reliable since it was a prefectural government program.	0.286	0.322	0.212	<i>3.026***</i>	0.391
	12. Because I couldn’t find any other work.	0.188	0.185	0.195	<i>0.305</i>	0.194
	13. No special reason.	0.039	0.041	0.035	<i>0.432</i>	0.266
Area	Kennan (southern) dummy (kennan=1, other=0)	0.077	0.100	0.030	<i>3.252***</i>	0.413
	Kenhoku (northern) dummy (kenhoku=1, other=0)	0.217	0.237	0.177	<i>1.801*</i>	0.493
	Kenchu (central) dummy (kenchu=1, other=0)	0.416	0.414	0.420	<i>0.150</i>	0.308
	Aizu and Minami Aizu dummy (Aizu or Minami Aizu =1, other=0)	0.106	0.081	0.156	<i>3.030***</i>	0.223
	Sousou dummy (Sousou =1, other=0)	0.052	0.044	0.069	<i>1.431</i>	0.497
Work type	Office work dummy (Office work=1, other=0)	0.446	0.573	0.195	<i>9.424***</i>	0.197
	Medical and welfare work dummy (Medical and welfare work =1, other=0)	0.041	0.028	0.065	<i>2.299**</i>	0.362
	Light manual work dummy (Light manual work=1, other=0)	0.155	0.063	0.338	<i>9.393***</i>	0.364
	Community work dummy (Community work=1, other=0)	0.157	0.078	0.312	<i>7.952***</i>	0.369
	Radiation-related work dummy (Radiation-related work =1, other=0)	0.162	0.222	0.043	<i>6.011***</i>	0.486
	Contact with disaster victims	0.383	0.233	0.680	<i>11.381***</i>	0.768
	Amount of judgment required	2.155	2.118	2.229	<i>1.804*</i>	0.739
Environment	Workplace situation (have access to trainer or instructor)	3.368	3.370	3.364	<i>0.113</i>	0.752
	Workplace situation (have access to operational manual)	3.203	3.200	3.208	<i>0.121</i>	0.767
	Workplace situation (training sessions provided)	2.871	2.819	2.974	<i>2.502**</i>	0.698
	Workplace situation (occupational ability or skills have improved)	3.199	3.233	3.130	<i>1.833*</i>	0.000

Note: *, **, and *** denote statistical significance at 10%, 5% and 1% respectively.

not necessarily match their former resident areas. These variables can also be considered as dummies representing the employment support agency in charge.

(d) Work type dummy

These are dummy variables concerning the content of work the respondent is engaged in. The “contact with disaster victims” dummy is a dummy variable that is 1 only when the respondent comes into contact with disaster victims on a mostly daily basis. The “amount of judgment required” is an explanatory variable for which the four-level responses to the questions on the routineness of work or the amount of judgment required are used. The larger the value, the respondent is engaged in work which is the more routine and requires less judgment.

(e) Work environment

These variables are expressed by three values: the higher the value, the more the given “workplace situation” applies.

5.4. Results of Regression Analysis

Using the “connectedness” and “positivity” factors multiplied by (−1) as the explained variables, and the explanatory variables described above, statistical analysis based on ordinary least squares (OLS) was carried out. The results are presented in **Table 4**. Due to space limitations, those variables that were found to be statistically insignificant are omitted. The higher the coefficient of the variable, the greater is its effect toward increasing “connectedness” or “positivity.”

We now examine the results in some detail. Of the variables on individual attributes with respect to “positivity,” “male” is negatively significant and “age” is positively significant. In other words, the “positivity” factor is higher among females and in higher-aged people.

With respect to “connectedness,” the “regular employee dummy” and “self-employed, employed by family business dummy” are positively significant. There might be a tendency for respondents who had previously been employed as regular employees or had been self-employed or employed by their family businesses to appreciate the human connections under their new working environments. Or we might say that the “connectedness” factor is lower among part-time workers and other non-regular workers.

A noteworthy finding is that “evacuation or not” had a positive significance to both factors and, in particular, the magnitude of the coefficient with respect to “connectedness” is high in comparison to the other variables. In other words, those respondents who were leading lives as evacuees tended to feel higher “connectedness” and “positivity” score under the Kizuna project.

This finding is consistent with prior studies on evacuees due to the nuclear plant accident. Sato, Narita and Tamba [13] identified 28,184 evacuees who had previously lived in the eight municipalities in the Futaba area from municipal residents list, and conducted a questionnaire survey against them. They carried out a regression

analysis of the explanatory factors of the mental health status of disaster victims, and found that the prospects for work had a high statistical significance in terms of exerting a positive effect. We shall examine this issue in some more depth later.

Next, we examine the reasons for participation in the Kizuna project. Those who participate “because I wanted to contribute to the reconstruction of Fukushima,” “to newly acquire experience or skills,” or “because it was reliable since it was a prefectural government program,” displayed significantly high coefficients to both “connectedness” and “positivity.” Furthermore, the reason “because I needed an income” also had a significantly positive value with respect to “positivity.” This finding makes intuitive sense since those who need an income would naturally feel positive about earning an income. These findings suggest that the Kizuna project provides a degree of satisfaction to not only those respondents whose main motivation was to support disaster victims and contribute toward reconstruction efforts, but also those whose motives lay in finding work or furthering their careers, including acquiring new knowhow or skills, or earning an income.

However, the level of emotional satisfaction was significantly low among those respondents who participated in the Kizuna project for the reason, “because I couldn’t find any other work.” It is intuitively understandable that respondents who had been participated by a “process of elimination,” i.e., because there was no other work available, would have a low sense of satisfaction, but this could be said for any type of work and not just the Kizuna project.

None of the “area” variables were found to be statistically significant, showing that there were no differences among the recruitment areas (or employment support agencies). For the work type, the “contact with disaster victims” dummy variable had a statistically significant positive value for both explained variables. This means that respondents who had frequent direct contact with disaster victims tended to evaluate the Kizuna project in a positive light; this also is natural since it would be rather difficult to gain emotional satisfaction in line with the spirit of the Kizuna project if there is no contact with disaster victims. With regard to the work environment, the variable “have access to trainer or instructor” was positive and statistically significant. This indicates that the ready availability of instruction or training sessions serves to increase the degree of emotional satisfaction of the respondents, not only because it can be useful for finding later work, but because it gives them a sense that they are helping disaster-struck areas as well as hope for the future.

5.5. Difference Between Those Who Had Evacuated and Those Who Had Not

The Kizuna project employs a mixed group of people including those who had been directly affected by the Great East Japan Earthquake and Tsunami and those were not so affected. The process by which they gain emotional satisfaction through employment in the Kizuna project

Table 4. Results of regression analysis on evaluation of Kizuna project.

Dependent variables		“Connectedness”		“Positivity”	
	Explanatory variables	Coef.	T-stat.	Coef.	T-stat.
	Constant term	-2.245	-7.153***	-2.660	-8.445***
Individual attributes	Gender dummy (male=1, female=0)	-.127	-1.605	-.363	-4.571***
	Age	.005	1.602	.009	3.286***
	Evacuation or not	.384	4.449***	.176	2.029**
	Regular employee dummy (regular employee before disaster =1, other=0)	.150	2.009**	.037	.500
	“Self-employed, employed by family business” dummy (employed by family business before disaster =1, other=0)	.222	1.925*	.158	1.367
Reasons for participation	1. Because I wanted to contribute to the reconstruction of Fukushima	.268	3.826***	.285	4.053***
	2. Because I could make use of my previous experience or skills	.128	1.668*	.076	0.990
	3. To newly acquire experience or skills	.245	3.130***	.276	3.509***
	6. Because I needed an income.	-.042	-.631	.131	1.978**
	7. Work conditions such as wages were better than other work.	.104	1.288	.151	1.861*
	11. Because it was reliable since it was a prefectural government program.	.280	3.686***	.263	3.457***
	12. Because I couldn’t find any other work.	-.178	-2.165**	-.179	-2.168**
	Office work dummy (Office work=1, other=0)	-.352	-2.091**	-.154	-0.913
	Contact with disaster victims	.270	3.176***	.195	2.280**
Environment	Workplace situation (have access to trainer or instructor)	.202	4.137***	.199	4.056***
	Workplace situation (have access to operational manual)	.088	1.780*	.063	1.265
	Workplace situation (training sessions provided)	.107	2.227**	.031	.652
	Workplace situation (occupational ability or skills have improved)	.168	3.280***	.306	5.964***
	Degree of freedom	689		689	
	F statistics	8.464***		7.735***	
	R-squared	0.324		0.305	
	Adjusted R-squared	0.286		0.266	

Note: *, **, and *** denote statistical significances of 10%, 5%, and 1%, respectively.

may differ between these two groups. In the earlier analysis, we saw that the degree of emotional satisfaction differs greatly depending on whether the respondent had experienced life as an evacuee or not. In this section, statistical analysis was carried out by dividing the sample population into two groups: evacuees (evacuation), considered to have been strongly affected by the disaster, and others (no evacuation). The descriptive statistics of the variables for the two groups are given in **Table 3**. It can be seen that statistically significant differences between the “evacuation” and “no evacuation” groups exist in the average values of the variables. It is interesting to find that “connectedness” is overwhelmingly high for the evacuation group. With regard to individual attributes, the evacuation group has a higher portion of main income earners, and of those who had lost their jobs due to the disaster. Furthermore, the portion of those who had clear reasons for seeking employment under the Kizuna project, such as “I wanted to contribute to the reconstruction of Fukushima,” “to newly acquire experience or skills,” or “work conditions such as

wages were better than other work,” is lower in the evacuation group. It can be surmised that, among evacuees due to the nuclear plant accident, many sought employment under the Kizuna project mainly as an interim measure, without possessing any active motivation.

The results of the regression analysis for the two groups are presented in **Tables 5** and **6**. As in **Table 4**, those variables which were found to have no statistical significance are omitted for reasons of space limitation.

The analysis results show that the process of gaining emotional satisfaction differs greatly between the evacuees and others. We first examine the results with respect to positivity. The coefficients for the “male” dummy variable are negative with statistical significance in both groups, but the magnitude is greater in the evacuation group, indicating that male evacuees have a lower sense of positivity relative to the women. Since a greater proportion of men had been employed before the disaster, it is possible that they have a low sense of positivity due to having no choice but to engage in work that differs from

Table 5. Comparison between groups “no evacuation” and “evacuation”: Positivity (excerpted).

Explanatory variables	No evacuation		Evacuation	
	Coef.	T-stat.	Coef.	T-stat.
Constant	-2.357	-5.937***	-2.982	-5.228***
Gender dummy (male=1, female=0)	-.245	-2.511**	-.460	-2.936***
Age	.010	2.678***	.007	1.304
University graduate dummy (graduated university or above=1, other =0)	-.174	-2.141**	.198	1.388
1. Because I wanted to contribute to the reconstruction of Fukushima	.260	3.023***	.247	1.791*
3. To newly acquire experience or skills	.295	3.246***	.194	1.140
4. Because recruitment was quick and it was convenient.	.225	2.082**	-.277	-1.625
11. Because it was reliable since it was a prefectural government program.	.305	3.335***	.158	1.014
12. Because I couldn't find any other work.	-.202	-1.926*	-.112	-0.775
Contact with disaster victims	.216	1.883*	.227	1.557
Workplace situation (have access to trainer or instructor)	.108	1.765*	.313	3.455***
Workplace situation (have access to operational manual)	.039	0.640	.112	1.138
Degree of freedom	458		230	
F statistics	5.558***		3.485***	
R-squared	0.322		0.393	
Adjusted R-squared	0.264		0.280	

Note: *, **, and *** denote statistical significances of 10%, 5%, and 1%, respectively.

Table 6. Comparison between groups “no evacuation” and “evacuation”: Connectedness (excerpted).

Explanatory variable	No evacuation		Evacuation	
	Coef.	T-stat.	Coef.	T-stat.
Constant	-2.051	-5.120***	-2.184	-3.882***
Gender dummy (male=1, female=0)	-.136	-1.664*	-.008	-0.057
Age	.260	2.803***	-.057	-.403
1. Because I wanted to contribute to the reconstruction of Fukushima	.261	3.013***	.285	2.096**
3. To newly acquire experience or skills	.266	2.901***	.203	1.206
4. Because recruitment was quick and it was convenient.	.214	1.962*	-.244	-1.452
11. Because it was reliable since it was a prefectural government program.	.237	2.563**	.385	2.508**
12. Because I couldn't find any other work.	-.203	-1.924*	-.157	-1.099
Contact with disaster victims	.283	2.446**	.339	2.356**
Workplace situation (have access to trainer or instructor)	.087	1.402	.365	4.083***
Workplace situation (have access to operational manual)	.153	2.559**	.067	.751
Workplace situation (occupational ability or skills have improved)	.185	2.924***	.109	1.106
Degree of freedom	458		230	
F statistics	4.783***		2.879***	
R-squared	0.290		0.348	
Adjusted R-squared	0.229		0.227	

Note: *, **, and *** denote statistical significances of 10%, 5%, and 1%, respectively.

their previous work because of evacuation. The reasons of non-evacuee disaster victims for losing their jobs were ultimately based on decisions by the company or themselves, even when the disaster had been the cause. In con-

trast, there is no room for such judgment for evacuees, who would perceive their being deprived of employment as a great loss.

Meanwhile, most of the coefficients of the variables for

“reasons for participation” do not display statistical significance in the evacuation group. Furthermore, neither age nor the “university graduate” dummy is statistically significant. Thus, while the emotional satisfaction of the “no evacuation” group is affected by their “reasons for participation” or individual attributes, this cannot be said for the “evacuation” group, which displays a high positivity across the board.

Another feature is that, among the variables for the “work environment,” the coefficient for “have access to trainer or instructor” is statistically significant, and about three times that in the “no evacuation” group. Meanwhile, the coefficient for “occupational ability or skills have improved” is found to be higher in the “no evacuation” group. This can be interpreted to mean that a large portion of evacuees from the nuclear plant accident hope to return to their previous jobs after the contract period of the Kizuna project terminates⁴, and thus are not so interested in improving their skills, but instead appreciate the presence of a supervisor who understands their situations, and that this is serving to increase their sense of positivity.

When “connectedness” is the explained variable (**Table 6**), the “male” dummy variable is statistically insignificant for both groups, unlike “positivity.” With respect to “reasons for participation,” “because I wanted to contribute to the reconstruction of Fukushima” and “because it was reliable since it was a prefectural government program” are statistically significant in the evacuation group, although the “reasons for seeking employment” have a lower effect on the sense of connectedness as compared to the “no evacuation” group. Here too, the evacuees are found to share a high sense of connectedness across the board, regardless of their individual attributes or reasons for participation. “Contact with disaster victims” has a statistically significant effect on connectedness in both groups, but the effect is slightly greater in the evacuation group. This can be interpreted to mean that the Kizuna project has been helpful in restoring community ties among the evacuees, most of whom have become separated from their families or communities.

In the above analysis, additional explanatory variables, consisting of the hourly wage and evaluation of wage level used in **Fig. 8**, were introduced to conduct another round of statistical analysis. Neither variable was found to be statistically significant in regression equations in which the factors of connectedness or positivity were used as the explained variable. In other words, the wage level appears to have no effect on emotional satisfaction. Note, however, that this should not be interpreted as providing justification to the CFW approach of keeping wage levels low. This is because the wage levels provided by the Kizuna project are in most cases similar to the ongoing market rate and in some cases even slightly higher, and there is no guarantee that wage levels considerably below the market rate, such as those adopted in CFW schemes, would not reduce the emotional satisfaction of participants.

4. 14.8% of the “no evacuation” group stated that they “hoped to return to their previous jobs” after the contract period of the Kizuna project expires, while 34.6% of the evacuation group stated likewise.

6. Conclusion

The CFW program implemented in Fukushima Prefecture targets the unemployed, including many who are not taken up by employment safety nets, such as self-employed, part-time and temporary (dispatched) workers. Furthermore, the CFW program provides the main income for the 40% of participating households. Targeting is therefore found to be functioning successfully. Unlike CFW programs in developing countries, which are centered on manual labor, the Fukushima project offers a wide range of work including office work. It was found that, in this manner, the participants’ previous experience and skills are being made use of to some extent in their current assignments.

While the level of emotional satisfaction is generally high among the participants of the Kizuna project, evaluation regarding items such as promoting ties within communities or among evacuees, which is the stated goal of the Kizuna project, is somewhat low in relative terms. This indicates the difficulty of providing community support based on paid work, and presents an issue for future investigation.

From an analysis of the disaster victims’ subjective evaluations of the Kizuna project, the two factors, “connectedness” and “positivity,” were extracted. In the sample group consisting of those who had not evacuated, it was found that these factors increased by having frequent contact with disaster victims, and by the presence of personnel to train or instruct them. These are points that need to be emphasized when designing future CFW programs.

Meanwhile, the “connectedness” factor is overwhelmingly high among evacuees as compared to others, indicating that the mere fact of being an evacuee is itself a major factor that works to increase emotional satisfaction by participating in the project. This effect can be interpreted to mean that the communities which had disintegrated due to evacuation were reconstructed through employment. This suggests that the CFW program is more effective in disasters that accompany long-term evacuation.

Furthermore, it was found through this analysis that the participants’ work environment affected their emotional satisfaction. It is thus essential to provide suitable instructions and training opportunities to project participants, just as in normal times, even when the adopted program is a post-disaster emergency measure.

It should be noted, however, that the findings arrived at in this study pertain to victims of nuclear plant accidents and may be unique to them. Whether our conclusions can be extended to generally apply to other natural disasters is an issue that requires further investigation.

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References:

- [1] Mercy Corps., "Guide to Cash-for-Work Programming," 2007.
- [2] UNDP, "Haiti: One Year Later," United Nation Development Programme, 2010.
- [3] P. Harvey, "Cash-based responses in emergencies," HPG Report 24, Overseas Development Institute, 2007.
- [4] GTZ, "CASH FOR WORK: A Contribution to the International Debate based on Lessons Learnt in Northern Afghanistan," Federal Ministry for Economic Cooperation and Development, Germany, 2009.
- [5] MRCs, "Myanmar : Cyclone Nargis Operations: Cash for Work (CFW) Program," Myanmar Red Cross Society, 2009.
- [6] S. Doocy, M. Gabriel, S. Collins, C. Robinson, and P. Stevenson, "Implementing cash for work programmes in post-tsunami Aceh: experiences and lessons learned," *Disasters*, Vol.30, No.3, pp. 277-296, 2006.
- [7] D. Echevin, F. Lamanna, and A-M. Oviedo, "Who Benefits from Cash and Food for Works Programs in Post Earthquake Haiti," Munich Personal RePEC Archive, MPRA Paper No.35661, Dec. 31, 2011.
- [8] JILPT, "Case studies for considering job recovery from Great East Japan Earthquake: Unsen-Fugendake eruption, Great Hanshin-Awaji Earthquake, Niigata Chuetsu Earthquake, Noto peninsula Earthquake and Chuetsu-oki Earthquake," The Japan Institute for Labour Policy and Training, No.106 (in Japanese).
- [9] S. Hashimoto, "Kizuna project in Fukushima and the function of NPO in local community: Job creation, life support and local community," *Kyodo no Hakken*, No.236, pp. 68-81, 2012 (in Japanese).
- [10] S. Nagamatsu, "Livelihood and Job Creation, The World Bank, Learning from Megadisasters: Knowledge Notes," Cluster 4: Recovery Planning, Note 4-5, 2012, <http://wbi.worldbank.org/wbi/document/job-creation> [accessed Feb. 22, 2014]
- [11] S. Nogawa, "The Great East Japan Earthquake and a future vision for Labor Law in Japan," *Japan Labor Review*, Vol.9, No.4, pp. 105-123, 2012.
- [12] CFW-Japan, "A questionnaire survey on the participants of Kizuna Project in Fukushima," Cash for Work Japan, 2013 (in Japanese), <http://www.cfwjapan.com/reportinfo/detail?id=15> [accessed Feb. 22, 2014]
- [13] K. Sato, K. Narita, and F. Tamba, "Psychological Wellness of Evacuees from Futaba Residents following Fukushima Nuclear Accident and Hope for Recovery Program," *Journal of Social Safety Science*, No.198, pp. 189-198.

Appendix A.

The proportion of evacuees due to the nuclear plant accident among potential applicants for employment in the Kizuna project, as of the end of March, 2012, is estimated.

First, we determine the number of potential job applicants. According to the population census conducted in October, 2010, just before the disaster, there were 71,915 people who were wholly unemployed in Fukushima Prefecture. Since the number of wholly unemployed at the time of our survey is unknown, this is estimated by multiplying the above by the rate of change of the number of recipients of employment insurance benefits over the time period in question. The number of recipients of employment insurance benefits, including individual extensions of benefits, increased from 10,862 as of October, 2010, to 19,658 as of March, 2012. Assuming that the number of wholly unemployed increased at the same rate, there were an estimated 130,151 unemployed people in Fukushima Prefecture as of March, 2012.

How can we estimate the number of evacuees among the unemployed? According to the Fukushima prefectural government, 58,589 people have evacuated from the planned evacuation and evacuation zones to emergency temporary housing units (including private units rented by local municipalities for use as temporary housing) located within the prefecture. Since the employment rate in the eight municipalities in the Futaba area before the earthquake was 59.6%, by multiplying by this figure, we obtain 34,919 as the number of people who would be seeking employment. Thus, we have

$$\begin{aligned} & \text{(Number of evacuees seeking employment)} / \text{(Number of wholly unemployed)} \\ &= 34,919 / 130,151 = 0.268 \end{aligned}$$

suggesting that evacuees from the nuclear plant accident make up about 26.8% of the potential job seekers in Fukushima Prefecture.

However, this figure is likely to be excessively high. The reasons are that 1) while the above estimation is based on the assumption that all evacuees are unemployed, there is likely to be a considerable number of municipal employees and company workers who were able to retain their jobs by relocating, etc., and that 2) the evacuees receive a monthly stipend of 100,000 yen from Tokyo Electric Co. as compensation for the emotional distress of having to live an evacuee's life, so that their financial need to find employment is likely to be lower than the unemployed population at large. If so, evacuees would make up a smaller share of the job seekers.

Taking the above into account along with the fact that evacuees from the nuclear plant accident make up over 30% of the participants of the Kizuna project, we can conclude that the Kizuna project serves as a system for employing a relatively high number of evacuees from the nuclear plant accident. It should be noted here that "evacuees from the nuclear plant accident" are restricted in this paper to those who had resided in the evacuation or planned evacuation zones and had been forced to evacuate to live in temporary housing units or private units rented by municipal governments as temporary housing, and thus are eligible to receive support from local administrative bodies or Tokyo Electric Co. In other words, voluntary evacuees are not included here.



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