

A Research on the Significance of Migrants' Social Capital in Disaster Risk Reduction and Recovery of Communities

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(1) BACKGROUND. Large scale and even local disasters creates adverse effects to people's lives. Beyond the changes in the infrastructure and the physical environment, changes happen in the social fabric. People are placed in various degrees of vulnerabilities; and migrants are among those in a relatively disadvantaged position in times of disaster. Over the recent years, there has been a shift in the views of migrants in disasters. The 3rd World Conference on Disaster Risk Reduction in Sendai (March 2015) emphasized that migrants are significant stakeholders in disaster risk reduction:

(vi) Migrants contribute to the resilience of communities and societies and their knowledge, skills and capacities can be useful in the design and implementation of disaster risk reduction. (Sendai Framework for Disaster Risk Reduction, March 2015, 21)

To fully implement this new recognition of migrants' contribution in the disaster risk reduction of their communities, it is important to identify the skills and capacities to participate. Among these capacities that migrant can avail comes from their network of social relations within and across their spheres of connections. Social capital is a key and intangible resource in disaster risk reduction. It primarily assumes that the available forms of connections (bonding, bridging and linking) inherent to migrants had a substantial relation to their disaster response and recovery. The study assesses the significance of migrants' (foreign residents) social capital in the Disaster Risk Reduction and Recovery of their communities. This study focuses on the case of foreign residents and the 2011 Great East Japan Earthquake.

The study looks at the potential people in the migrants network and how they contribute to their disaster response and recovery. Trusting people is a form of risk-taking, thereby it can be predicted. By using statistical modeling, this study sought these preferred people across this migrants network. Identifying these social actors and the "odds" to which they will prefer to likely/less likely contact in instances of disaster and during recovery can provide the idea of which social relations should be further enhanced and identify the potential activities to engage them.

1.1. What is social capital?

In the modern development of social capital, the variety of definition created revolves around a number of key concepts such as *trust, mutual understanding, networks, communities and cooperative action*. Scholars see it as a collectively owned resource (Bourdieu 1985), or even as a function of a social structure (Coleman 1988). Putnam (2000) expounds on this connection in the context of reciprocity and trust-worthiness; while policy makers and institutions continue to utilize its definition along the lines of networks of social relations and interactions (Woolcock and Narayan 2000, Policy Research Initiative 2005).

More often than not, social capital is best described and represented through the kind of social connections built thereby implying both the presence of trust the kind of connection built. *Bonding*

social capital speaks to that network of social relations that reinforce exclusive identities among a homogenous group, in comparison to *bridging capital* that suggests the networks encompassing people across diverse social cleavages (Putnam 2000). *Linking social capital* considers the network of trusting relationships across [vertical] explicit, formal or institutionalized power or authority gradients in society (Sztreter and Woolcock 2004).

Disasters are among the emerging themes that sought to understand the importance of people's connections to bounce back from disasters and recover better. Even disaster social capital literatures often offer *reflective* approached to understand how damages are incurred and the successes of different choices made. Thus, this research attempts to provide an alternative view to people's social capital. More specifically, it predicts those specific to migrants; that by understanding people's diverse backgrounds and pre-existing connections with various actors it can identify the preferred connections during disasters and in recovery.

(2) METHODOLOGY. This study explores the correlation between migrant's social connections and interaction with various social actors (social capital) and their disaster response and recovery. *Its key assumption is that migrants' individual characteristics, together with established contacts can contribute in their preference of sought connections during and after a disaster.* A social survey is the primary research instrument, supplemented by interviews with key resource persons. All data are integrated to support the analysis of predicting social capital related preferences among migrants/ foreign residents in Sendai City.

2.1. Migrant-specific Social Capital Survey

A 36-question survey available in both English and Japanese were distributed to foreign residents in Sendai between July 01-September 15, 2016. An established contact with the SenTIA (Sendai Tourism, Convention and International Association), Sendai International (webpage group of foreign residents in Sendai), and personal connections were utilized to execute the survey. The distribution was made through online format (Google form), and was able to generate 132 valid responses. Fig.1 presents the schematic diagram of the survey including the various data required in each part.

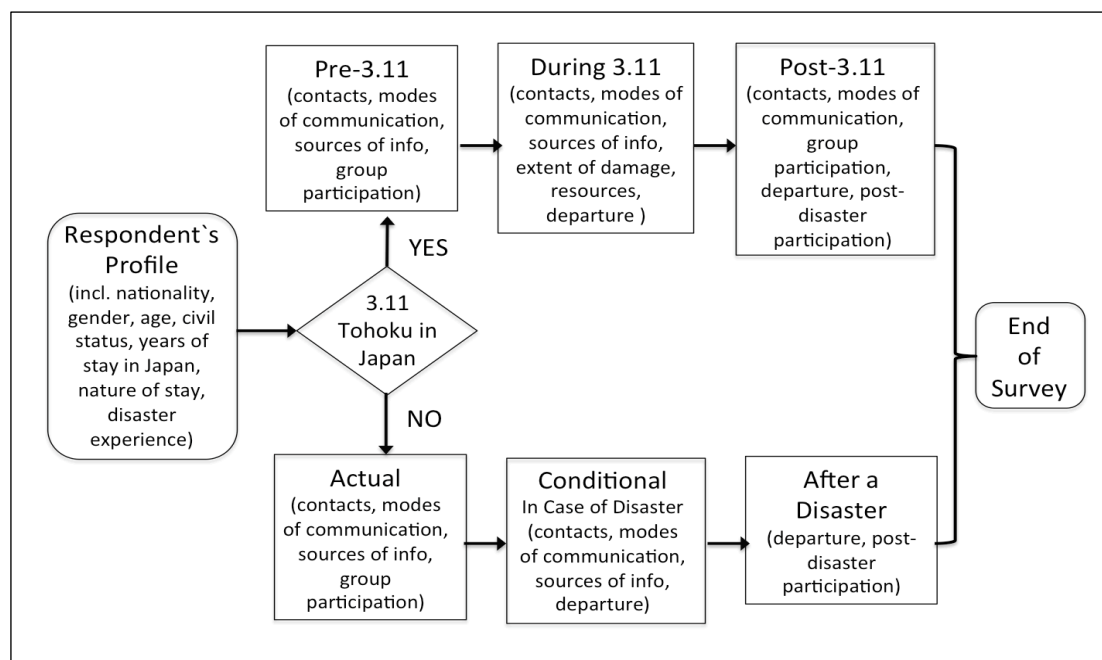


Figure 1 Migrant social capital schematic diagram

Table 1 presents the selection of social actors available in each time frame of disaster. The list was completed through the combined interviews with migrant respondents and literature reviews. Eleven of the identified social actors were present across the three phases of the disaster. The presence of the *Disaster Emergency Team* was only listed during and after the disaster.

Table 1 List of Social actors for migrants

| Social actors | Description |
|--|--|
| Classmates/ Co-workers | Individuals from the same educational institution or workplace as the respondent |
| Disaster emergency team | Social group engaged in the disaster response, management and recovery |
| Embassy/Consulate of home country | Diplomatic office from the country of origin in the host country |
| Family in Home Country | Individuals with familial ties to the respondent living in their home country |
| Family in Japan | Individuals with familial ties to the respondent living in Japan |
| Friend | Individuals with non-familial affinity to the respondent regardless of physical proximity |
| Local/ City government (Int'l Relations Section) | State-related entity in the local level in-charge of foreign residents |
| Neighbor | Individuals residing within the significant periphery of the resident |
| NGO/NPO | Social group engage with the community for development projects |
| Other foreign residents | Individuals with no direct familial or personal relations with the respondents, having different ethnicity/nationality |
| People from the same country | Individuals with no direct familial or personal relations with the respondents, having the same ethnicity/nationality |
| Relative | People with familial affinity to the respondent regardless of physical proximity |
| Religious group/ Faith-based organization | Social group or entity of religious origin |

2.2. Statistical models for migrants' social capital

This study intends to identify the relevant social connections migrants can access when they respond and recover from the disasters. In quantifying social capital measures of trust and the strength of norms, reciprocity and sharing can be substituted with more tangible references (Grootaert and van Bastalaeer 2002). In such case, individuals and communities' established and maintained connections with persons and institutions can serve as valid measures of trust. In disasters, these are the *social actors* representing the available social capital for the individual and their community to advance their resilience, minimizing their risk and reaching recovery.

Using SPSS Ver. 22, Multinomial Logistic Regression was used to substantiate this significance and odds of their choice in social actors. As a statistical analysis, it fits the demand to predict a nominal dependent variable against more than one independent variable. The respondents' (migrants) choice of social actors during and after a disaster can be identified in relation to the various demographic characteristics and existing social contacts they have. The study now validates if these attributes have notable impact to their choice of social actors during disaster response and recovery. Using a 0.05 level of significance as margin, this regression analysis is used to classify subjects based on their set of predictor variables (social connections and demographic characteristics) and analyzed the potential rationale for these results.

Table 2 summarizes all the variables used in this study selected from the survey. Variables to represent migrants' social connection were address by their choice of contacts before (PreCont) and during (DurCont) a disaster. Basic demographic details included age, gender, and length of stay in the host country. Additional social details referred to were from their disaster experiences from their home country, the 2011 Great East Japan Earthquake experience, their current social participations and preferred post-disaster involvement (PostDisAct). Using all these variables, two models were designed to validate this significance of migrants' social contacts during the disaster and in its recovery.

Table 2 Variable Summaries

| Variable | Description |
|---------------------------------------|--|
| Contacts during disaster (DurCont) | Respondents were asked their choices of contact during disaster: (1) Family in Japan, (2) Family in the home country, (3) Friends, (4) Neighbors, (5) People from the same country, (6) People from other country, (7) Classmates/ Colleague, (8)Religious/faith groups, (9) NGO/NPO, (10) Disaster/emergency team, (11) Local government-International Relations Office, and (12) Embassy/ Consulate. |
| Contacts before a disaster (PreCont) | Respondents were asked their choices of contact they usually contact (before a disaster): (1) Family in Japan, (2) Family in the home country, (3) Friends, (4) Neighbors, (5) People from the same country, (6) People from other country, (7) Classmates/ Colleague, (8)Religious/faith groups, (9) NGO/NPO, (10) Local government-International Relations Office, and (11) Embassy/ Consulate. |
| Disaster experience in home country | Respondents were asked the disasters they experienced in their home country: (1) Hurricane, (2) Flood, (3) Earthquake, (4) Tsunami/Storm Surge, (5) Volcanic, and (6) Other. |
| 2011 GEJE experience | Single item from the survey on a dichotomous scale (0=Yes, 1=No): "Where you in Japan during the 2011 Earthquake?" |
| Social participation | Respondent`s participation in any of the following groups: (1) local neighborhood association, (2) ethnic group (people from the same country), (3) professional association, (4) faith-based association, (5) civic/ volunteer association, and (6) disaster prevention group. |
| Post-disaster activities (PostDisAct) | Respondents were asked their choice of post-disaster activities they will be interested to participate: (1) economic programs, (2) cultural activities, (3) environmental rehabilitation, (4) disaster information dissemination, and physical reconstruction. |
| Age | Respondent`s age grouped in the following ranges: (1) below 20, (2) 20-29, (3) 30-39, (4) 40-49, (5) 50-59, and (6) 60 and above. |
| Gender | 0= Female, 1= Male |
| Status | Respondent`s civil status: (1) Single, (2) Married, (3)Divorce, (4) Separated, and (5) Widowed. |
| Length of stay | Respondent`s years of living in Japan grouped in the following ranges: (1) less than a year, (2) 1-3 years, (3) 4-5 years, (4) 6-10 years, and (5) more than 10 years. |

There are two cases confirmed in this study: (1) migrants' preferences in disaster contacts (Model 3) and (2) their preferred post-disaster engagements (Model 4). The results of these models were examined to validate the study's assertion on the significance of migrant social capital in mitigating disaster risks and in recovery participation.

Model (1). Given the migrants/ foreigners` demographic profile, including their established pre-disaster contacts, what are the odds to their preferred contact during disaster? Eq. 1 determines if there is significance in the migrants` gender, age, status, length of stay, and pre-disaster contacts; in their choice of people to communicate with during the times of the disaster. This will identify the preferred contacts during disaster response.

Eq. 1

$$\log \{DurCont/ (1 - DurCont)\} = \beta_0 + \beta_1Gender + \beta_2Age + \beta_3Status + \beta_4Stay + \beta_5PreCont$$

Where β_n is the regression coefficient, and $p < 0.05$ level of significance to validate the study.

Model (2). Eq. 2 represents the mathematical model to describe the odds of post disaster participation based on the combined social and demographic profile, and pre-disaster contacts. This model looks at the likelihood migrants will engage in post disaster participation based on their age, gender, length of stay, their disaster experiences in their home country, pre-existing social participation, and their pre-disaster social contact.

Eq.2

$$\begin{aligned} \log \{PostDisAct/ (1 - PostDisAct)\} \\ = \beta_0 + \beta_1Gender + \beta_2Age + \beta_3Status + \beta_4Stay + \beta_5DisExp + \beta_6PreCont \\ + \beta_6SocPart \end{aligned}$$

Where β_n is the regression coefficient, and $p < 0.05$ level of significance to validate the study.

(3) RESEARCH SITE: SENDAI CITY. Historically, Sendai City started as castle town in the 1600. Over the years it developed with the different facilities and city utilities to make it a modern city. In 1989, with the city`s 100th year as an incorporated city, it was also the first designated city in the Tohoku region. In addition to this, based from the city`s information (City of Sendai 2016), it has a reputation as an academic city based on the advanced research and development that takes place there.

In 2011, Sendai was one of the urban centers in the northeast region of Japan that was affected by the Great East Japan Earthquake. More than the earthquake and aftershocks, some places were also affected by tsunami inundations. Fig. 10 presented an adapted graphical representation of deaths and evacuees from the 2011 Tohoku Earthquake (Isoda 2011). Based on the city`s independent count (City of Sendai 2016), resident casualties reached 1,002 persons (554 males, 448 females), and injured individuals totaled 2275 (276 serious, 1999 minor injuries). Property damages for residential land reached a 5,728 lots while a total of 255,689 lots ranging from those with minor damages to buildings that were totally destroyed.

3.1. Foreign residents in Sendai City

Sendai City was the selected research site for this Phase because of its location. It is one of the major cities with large migrant population located close to the center of the 2011 Tohoku Earthquake. As of April 30, 2016, there are a total of 11, 353 foreign residents in Sendai City with large fractions of the population coming from China (3,643), Korea (1,990), Vietnam (1, 202) and Nepal (1, 072) (Kikuchi 2016). Considered an academic city, Sendai houses 3,897 foreign students as the largest segment of its migrant population followed by 2,501 permanent residents. Two of the key challenges for foreign residents in Sendai City identified by the representative from the International Office are obtaining information given in Japanese and finding a job in Sendai.

Generally, foreign residents can avail the following supports from the International Office of the city as they move to the new environment: 1) Japanese language course for foreign residents, 2) international cultural understanding sessions at schools, 3) non-native Japanese children support, 4) subsidy for non-profit organizations to promote the international exchange in Sendai, and 5) disaster

risk management for foreign residents (Horino 2015, Kikuchi 2016). Foreign residents in the city are encouraged to participate in the community through programs like disaster risk management activity, international education at schools, non-native Japanese children support. These are mainly sponsored by the local government through their international office, and information are disseminated by email magazine, website, radio and flyers. Nonetheless, word-of-mouth still stands as a strong medium to urge program participations. Prior to the 2011 Tohoku Earthquake, disaster risk management training were foreign residents can participate with the aid of disaster interpreter volunteers are already held. Training programs for disaster interpreter volunteers had since started in 2000.

(4) SUMMARY OF RESULTS. The results from the survey provided the essential information to define the respondents. It describes their demographic profiles, their social contacts and participation relative to their actual experience of the disaster. This section summarizes the results of the statistical modeling to predict the migrants' social capital relevant to their disaster response and recovery.

4.1. Demographic details

Table 3 summaries the result from 132 respondents who completed the survey. There's a minimal gap in gender balance with 53.79% (71) female and 46.21% (61) male. The age range for the 58.3% (77) of the respondents are concentrated in the 20 to 29 age group, with 71.21% (94) of them being single. This complements 73.48% (97) of the respondents living in Sendai City for purposes of studying or training.

Large distribution of the participants stays in Japan between the 1-3 years period (34.1%, 45) followed by those living in Japan between 6 to 10 years (19.7%, 26). As for their disaster experience in their home country, 97.73% (129) had experienced at least one of those identified disasters. However, only 56.82% (75) of the respondents confirmed participation in social activities (even prior to a disaster).

From this information, it builds on the profile of the respondents matching the dominant pattern in the actual foreign residents of Sendai. As of April 2016, there are 11,353 recorded foreign residents, with the largest segment of the population (34.36%, 3897) being foreign students (Kikuchi 2016).

Table 3 Frequency summaries from the migrant social capital survey

| Variable | Frequency (N) | Valid Percentage |
|--------------------|---------------|------------------|
| Demographic | | |
| Gender | 132 | 100.0 |
| Male | 61 | 46.2 |
| Female | 71 | 53.8 |
| Age | 132 | 100.0 |
| below 20 | 1 | 0.8 |
| 20-29 | 77 | 58.3 |
| 30-39 | 45 | 34.1 |
| 40-49 | 9 | 6.8 |
| Status | 132 | 100.0 |
| Single | 94 | 71.2 |
| Married | 35 | 26.5 |
| Divorce | 3 | 2.3 |

| | | |
|--|----------|-------|
| Length of Stay | 132 | 100.0 |
| less than a year | 35 | 26.5 |
| 1-3 years | 45 | 34.1 |
| 4-5 years | 18 | 13.6 |
| 6-10 years | 26 | 19.7 |
| more than 10 years | 8 | 6.1 |
| Purpose of Stay | 132 | 100.0 |
| Professional | 15 | 11.4 |
| Student/ Training | 97 | 73.5 |
| Skilled worker | 6 | 4.5 |
| Cultural activities | 1 | 0.8 |
| Permanent resident | 3 | 2.3 |
| Spouse/ children of Japanese national | 3 | 2.3 |
| Spouse/ children of permanent resident | 7 | 5.3 |
| Disaster Experience | | |
| Hurricane | 48 (129) | 37.2 |
| Flood | 37 (129) | 28.7 |
| EQ | 82 (129) | 63.6 |
| Tsunami/Surge | 23 (129) | 17.8 |
| Volcanic | 4 (129) | 3.1 |
| Other | 17 (129) | 13.2 |
| 2011 GEJE Experience | 32 (132) | 24.2 |
| Social Participation (Pre-disaster) | | |
| Pre_Local Neighborhood | 7 (75) | 9.3 |
| Pre_Ethnic Group | 26 (75) | 34.7 |
| Pre_Professional Association | 18 (75) | 24.0 |
| Pre_Faith | 14 (75) | 18.7 |
| Pre_Civic | 39 (75) | 52.0 |
| Pre_Disaster | 5 (75) | 6.7 |

4.2. Predicting migrants' connections during Disaster (DV: DurCont)

Using multinomial logistic regression, the odds to which people will consider certain social actors during disasters over the others based on the demographic details and their existing contacts were calculated. Eq. 1 fits within the significant p-value ($p < 0.023$) thus making the model valid. Using gender, age, status, length of stay and the pre-disaster contacts as predictors, Table 4 summarizes the list of significant relation between the predictors and the dependent variables (DurCont).

Table 4 Model 1 Summary of parameter estimates

| DV: People's choice of contact during disasters | B | Std. Error | Sig. | Exp(B) | 95% Confidence Interval for Exp(B) | |
|---|------|------------|------|--------|------------------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| Family in Japan | | | | | | |
| PreCont: Family in Japan | 5.40 | 1.28 | 0.00 | 220.19 | 17.89 | 2710.32 |
| People from the same country | | | | | | |
| PreCont: People from the same country | 1.00 | 0.46 | 0.03 | 2.73 | 1.12 | 6.66 |
| People from other country | | | | | | |

| | | | | | | |
|--|-------|------|------|--------|-------|---------|
| PreCont: People from other country | 2.17 | 0.89 | 0.01 | 8.73 | 1.54 | 49.45 |
| Religious/ Faith Groups | | | | | | |
| PreCont: Religious/ Faith Group | 5.25 | 1.41 | 0.00 | 190.83 | 12.02 | 3029.60 |
| Local Government -Int'l Relations | | | | | | |
| Age: 21-29 | -3.59 | 1.82 | 0.05 | 0.03 | 0.00 | 0.99 |
| Age: 31-39 | -3.25 | 1.66 | 0.05 | 0.04 | 0.00 | 1.00 |
| PreCont: Local Government-Int'l Relations Office | 2.40 | 1.00 | 0.02 | 11.03 | 1.56 | 78.16 |

Notes: Model $X^2 = 275.798$; $p=0.023$, $-2 \log \text{likelihood} = 1331.133$. Pseudo R^2 (Cox and Snell = 0.300, Nagelkerke = 0.303, McFadden = 0.077). DV: dependent variable.

a. The reference category is: the contact with the Embassy during disasters.

Summing up the results of this model, pre-existing disaster contacts are predicted to be same preferred contact in instances of disasters. More so, the respondents within the age range 20-39 are more likely to contact the Embassy/Consulate than local government. Most of these respondents are students/trainees with a range of stay from 1-3 years.

4.3 Predicting migrants post-disaster participation (DV: PostDisAct)

After a disaster, a number of activities for social participation are often made available. Hence, the various demographic profiles together with previous social participation, disaster experience in their home country and their pre-disaster contacts; can potentially affect the preference in post-disaster social participation. Model 2 (Eq.2) with a level of significance of $p < 0.00$ ($2.97 \text{ E-}22$) becomes a valid model. The parameter estimates for this model is available on Table 5. The table presents the list of all significant cases ($p < 0.05$).

Table 5 Model 2 Summary of parameter estimates

| DV: Post Disaster Activities | B | Std. Error | Sig. | Exp (B) | 95% Confidence Interval for Exp (B) | |
|-----------------------------------|--------|------------|------|---------|-------------------------------------|-------------|
| | | | | | Lower Bound | Upper Bound |
| Eco Prog | | | | | | |
| Disaster Exp: Flood | -2.01 | 0.53 | 0.00 | 0.13 | 0.05 | 0.38 |
| Disaster Exp: Earthquake | -1.11 | 0.51 | 0.03 | 0.33 | 0.12 | 0.89 |
| Soc. Part.: Local Neighborhood | 2.70 | 0.86 | 0.00 | 14.81 | 2.77 | 79.26 |
| Soc. Part.: Ethnic Group | 2.18 | 0.63 | 0.00 | 8.85 | 2.59 | 30.21 |
| Soc. Part.: Prof. Assoc. | 2.45 | 0.60 | 0.00 | 11.63 | 3.57 | 37.92 |
| Soc. Part.: Civic | 1.33 | 0.48 | 0.01 | 3.78 | 1.49 | 9.61 |
| Cultural | | | | | | |
| Status: Single | 2.52 | 0.85 | 0.00 | 12.38 | 2.36 | 64.92 |
| Stay: Professional | -27.55 | 2.66 | 0.00 | 0.00 | 0.00 | 0.00 |
| Stay: Student/ Training | -28.84 | 2.64 | 0.00 | 0.00 | 0.00 | 0.00 |
| Disaster Exp: Hurricane | 0.79 | 0.35 | 0.02 | 2.21 | 1.11 | 4.40 |
| Disaster Exp: Earthquake | 0.93 | 0.43 | 0.03 | 2.53 | 1.09 | 5.85 |
| Disaster Exp: Tsunami/Storm Surge | 2.72 | 0.77 | 0.00 | 15.11 | 3.35 | 68.20 |
| Disaster Exp: Volcanic | -4.85 | 1.55 | 0.00 | 0.01 | 0.00 | 0.16 |
| Disaster Exp: Other | 2.29 | 0.56 | 0.00 | 9.88 | 3.31 | 29.42 |
| Soc. Part.: Ethnic Group | 1.00 | 0.45 | 0.03 | 2.73 | 1.13 | 6.58 |
| Environmental | | | | | | |
| Status: Single | 1.95 | 0.88 | 0.03 | 6.99 | 1.23 | 39.63 |

| | | | | | | |
|-------------------------------|--------|------|------|-------|------|-------|
| Stay: Professional | -27.69 | 1.67 | 0.00 | 0.00 | 0.00 | 0.00 |
| Stay: Student/ Training | -26.33 | 1.62 | 0.00 | 0.00 | 0.00 | 0.00 |
| Disaster Exp: Volcanic | -3.26 | 1.63 | 0.04 | 0.04 | 0.00 | 0.93 |
| Soc. Part: Ethnic Group | 0.81 | 0.41 | 0.05 | 2.25 | 1.01 | 5.02 |
| Disaster Info | | | | | | |
| Status: Single | 2.33 | 0.83 | 0.01 | 10.27 | 2.01 | 52.36 |
| Stay: Professional | -29.08 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 |
| Disaster Exp: Hurricane | 0.84 | 0.32 | 0.01 | 2.31 | 1.23 | 4.33 |
| Disaster Exp: Flood | -0.89 | 0.41 | 0.03 | 0.41 | 0.18 | 0.93 |
| Disaster Exp: Other | 1.49 | 0.51 | 0.00 | 4.44 | 1.63 | 12.14 |
| 2011 GEJE Experience | -1.67 | 0.74 | 0.02 | 0.19 | 0.04 | 0.80 |
| Soc. Part.: Ethnic Group | 1.38 | 0.44 | 0.00 | 3.99 | 1.70 | 9.38 |
| Soc. Part.: Prof. Assoc. | 0.92 | 0.38 | 0.02 | 2.51 | 1.19 | 5.30 |
| Soc. Part.: Faith-based Group | 0.80 | 0.36 | 0.03 | 2.22 | 1.09 | 4.53 |

Notes: Model $\chi^2 = 385.567$; $p=0.00$ (2.97 E-22), -2 log likelihood =1478.338. Pseudo R^2 (Cox and Snell = 0.317, Nagelkerke = 0.331, McFadden = 0.122). DV: dependent variable.

a. The reference category is: the preference to post disaster activity Physical Reconstruction.

As a result of this model, there is no significant direct relation of their pre-disaster contacts and their preference in post-disaster social participation in the post-disaster recovery situation. However, other predictors significantly affect their preference in post-disaster social activities- status, their status of stay in their host country and their existing social participation. Their pre-disaster social participations serve as “active spaces” for enhancing their social capital.

(5) DISCUSSIONS AND ANALYSIS. It has been consistently stated in this study how social capital manifests through the forms of connections and networks that transpire between people (Woolcock and Narayan 2000, Aldrich 2012a, Hawkins and Maurer 2010). This framework to visualize the available social connections can be applicable to many areas of studies and specific populations. Hence migrants’ disaster social capital can be graphically represented using this as well. Figure 2 presents the various positions of social actors across a migrants’ disaster network.

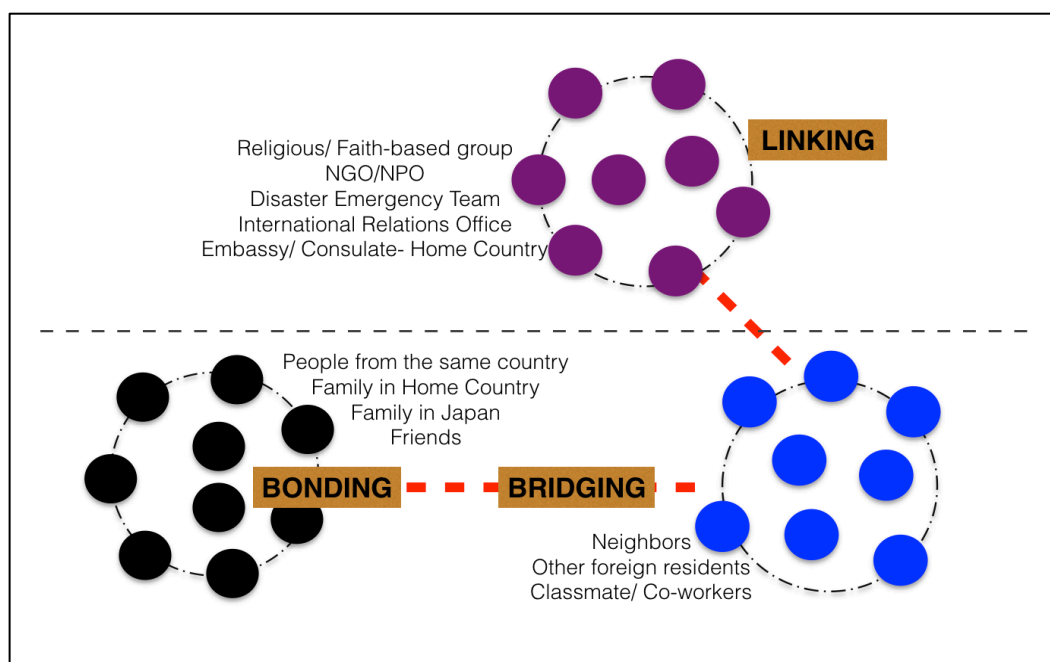


Figure 2 Modified Migrant Social Network Diagram

5.1. Migrant social actors

Bonding is referential to people within the immediate and exclusive network. For the migrants, there are the familial ties in both Japan and their home country, people from the same country and their friends. *Bridging* social capital is easily understood as the lateral connections established across other networks. Generally, this may include people they meet in the workplace, classmates or their colleagues, other foreign residents, and neighbors. Foreign residents, who settle in a community, may sometimes have lesser interaction with their immediate surroundings (i.e. their neighbors), than people who live at farther places (i.e. co-nationals, family in home country).

In instances of disasters, *linking social capital* are the active agents for people to avail and access better information and resources. Inclusive of this are religious/ faith-based groups, NGO/NPO, disaster emergency team, international relations office, and the embassy/consulate from the home country. For the migrants, the connection built with the local government's international office and the officials from the consulate of the home country are quite specific to the conditions of migrants.

5.2 Migrants and disaster risk reduction

Disaster risk reduction is everyone's business (United Nations Office for Disaster Risk Reduction), this inclusivity implies creating networks and connections; and migrants' connections matters in increasing their access to resources and empowering them. The results of Model 1 confirmed this importance of pre-existing contacts to be the sought and preferred contacts during disaster. Family in Japan (if available) is significantly preferred to the Embassy/Consulate from home country. This serves as the significant source of support for the individuals. Disasters are best faced as a collective single unit (Dynes 2006); thus people modify their network from their home country and establish a set of social support to enhance their ability to face disasters in their new place of residence. Non-familial entities like religious/faith-based groups are preferred contacts in times of disasters. Such institutions often establish connections to community prior to the disaster.

In instances of disasters, people modify their roles based on the multiplicity of obligations and expectations from the people within and across their networks (Dynes 2006). Most of the foreign residents would establish connections by the time they get to Japan. The common form of collective created is among co-nationals, or people of the same ethnicity.

5.3 Migrants and disaster recovery

Disaster literatures gradually recognized the necessity of social capital particularly in disaster recovery (Nakagawa and Shaw 2004, Aldrich 2012a, Joshi and Aoki 2014). Actions for social capital involve recognition, preservation/conservation and investment, to which "mutually beneficial collective action" and a sense of "shared thinking" in the community (Nakagawa and Shaw 2004). Post-disaster activities are good venue for social participation. Based from the survey data, 84 respondents are interested in participating in environmental programs, followed by cultural activities (72), disaster information dissemination (67), disaster reconstruction activities (56), and lastly economic programs (33).

Based from the modeling of Eq. 2, the disaster experiences in the home country showed significant value in predicting the preference in post-disaster participation. Those who experience disasters in their home countries are likely to be engage to various post-disaster activities. Based from the respondents, those who experience of typhoons and earthquakes in their home country are likely to participate in physical construction after. Also, the experience of hurricanes earthquakes and tsunami/ storm surges in their home country, invites participation to cultural activities after a disaster. Bankoff (2003) claims that the repeated experience of the disaster creates a sense of "normalized threat", thus it is not considered an alarming risk to safety. For migrants moving to their new place of residence, the prior experience of the disaster in the home country dampens this

effect to one's sense of personal safety. Hence, post-disaster participation related to their recovery is not a threatening risk.

In summary, disaster recovery entails enhancing connections across various networks. The variety of activities identified presents the different means to support the recovery process. However, each of these created recovery efforts will fail without people's participation. Migrants are presented with these varieties of activities to engage and participate. Each one addresses a general aspect of living that may be affected by the disaster that needs recovering from.

(6) CONCLUSION. The study has shown how the composition of migrants in the Sendai area primarily needs to gear support for mostly midterm migrants attending academic and research institutions. Thus, disaster risk reduction activities should be channeled through these institutions to better reach them. As explained (Kikuchi 2016) access to reliable disaster relevant information was among the key challenge faced by migrants during disasters. Preferences in post-disaster participation often appeared in various linking networks. Nonetheless, there is also other recovery-related activity that transpires in the migrants' ethnic (bonding) and professional (bridging) networks.

The aftermath of the 2011 Great East Japan Earthquake led to a further rethinking for residents (including foreigners) to recognize that foreign residents are not mere "guests" of the local community, and Japanese residents should treat them as full members of the local community (Kikuchi 2016). Social capital transpires between nodes, enhancing and establishing social connections and relation. Inclusion requires the collaboration among stakeholders and to do so, there is the need to recognize these capacities and be able to engage and be active partners in disaster risk reduction and recovery.

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