

**Globalization of Local Risks through International Investments and
Businesses: a Case for Risk Communication and Climate Fragility
Reduction**

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1.0 Introduction

Enhanced trade and investments have been one of the significant developments of regional integration in Asia during recent decades (ADB, 2017). Developing countries in general and those in Asia, in particular, have become producers of goods and services for rest of the world as a result of which investments in the region have grown significantly (The World Bank, 2018). In this context of rapidly growing global investments in Asia, countries that are successful in attracting global investments in manufacturing and service industries are also been seen as highly vulnerable to disasters and related losses (The World Bank, 2012). As a result, this has opened up doors to an important, inescapable and hidden phenomenon of 'globalization of local risks'. Before the advent of the global investments, the domestic risks that the countries are prone to, including risks from disasters, internal security, political uncertainty, social insecurity, have largely confined to within their borders. With the increasing global investments, there is more chance now for these local risks to spill beyond their borders and to become global as the foreign investments taking place in these countries are exposed to these risks and they tend to bring international implications beyond the borders of the countries where such investments are taking place. When the foreign investments are affected because of local risks, these risks tend to multiply in magnitude and spill over into international markets in terms of financial implications, in terms of the credibility of these companies, their investments, and the credibility of the countries in which these investments are affected. This phenomenon also affects communities beyond borders as the services of these companies are affected. Hence, the implications of the globalization of local risks are not just limited to the companies themselves but it is also relevant for foreign governments, societies, and institutions wherever the services and products of these companies are present. Understanding and addressing such risks are even more relevant today than a decade ago as more and more countries in Asia are eying to attract foreign investments but are yet to fully improve their disaster risk reduction and climate change readiness (WEF, 2018).

Largescale private investments are largely protected by various risk mitigation and management practices including insurance and portfolio diversification measures. These approaches could further globalize the local risks as insurance markets are globally connected and these efforts may not entirely isolate the local risks from spilling over beyond the host country boundaries even though the investors themselves are financially covered (Dahlen & Peter, 2012). Hence, there are still important questions to be asked both to the countries that are eager to accommodate foreign investments and to those investors who invest in vulnerable Asian countries.

While there is a need for the creation of an ecosystem for effective risk management, with contributions from the private sector, governments, civil society organizations, and science and technology institutions, the role of governments and private sector is of the paramount importance as direct stakeholders in transboundary investments. Some of the important questions for the host countries are a) what measures are put in place by the host countries to limit and or mitigate the local risks affecting the international investments, b) to what extent the local risks have been communicated to the international investors in a transparent manner, and c) what efforts have gone into understanding the uncertainty in the available information to fully understand and address the future risks. The question for the foreign investing entities are a) are the investments fully aware of the local risks, b) what measures have to be taken, including the criteria employed in conducting risk assessments, to mitigate the local risks from spilling over beyond the boundaries of countries where investments took place, and c) what it means for the risk assessments and risk communication? In this paper, an effort has been made to answer some of these questions using the literature review and results from an online structured questionnaire survey especially from the investing entities point of view. This paper also presents a climate fragility risk index (CFRI) that helps assess a country's suitability for investing from the point of view of climate fragility risks the countries have.

2.0 Interaction of Investments and Risks in Asia

2.1 Trends in investments in Asia

Asia's economy grew at a healthy growth rate of 4.6% in 2017 and it is projected to do marginally better in the next two years (ADB, 2018). Such growth has been possible through policy stimulus provided by governments boosting different forms of foreign investments in various economic sectors. Determinants such as investments into natural resources, strengthening infrastructure and communication, and political certainty have contributed to the interest of foreign investors in many Asian countries (ibid). Countries in the region also have made structural changes in their economies boosting both manufacturing and service sectors. In addition to these, the low cost of manufacturing due to relatively cheaper natural and human resources contributed to comfortable rates of return on investment which is a key contributor to attract foreign investments in Asia.

Consequently, Foreign Direct Investments (FDI) have more than doubled in 2016 compared to 1990 (The World Bank, 2018). Today, Asia is the largest FDI recipient in the world, with investments into manufacturing,

infrastructure, transport, and energy sectors in the recipient countries (UNCTAD, 2018). The role of FDI in economic development is undisputed (Ito & Krueger, 2000), it is the single largest source of external finances for most developing countries (UNCTAD, 2017), and countries in Asia will continue to attract FDI in the years to come as one of the important strategies for boosting their economic growth (UNCTAD, 2018). Asian countries are increasingly able to provide highly productive labor and low-cost production environments than other regions of the world and hence the greater potential for foreign investments in the near future (IBRD, 2017). Especially, there is a great potential for the South Asian countries through trade and investment liberalization and by putting in place facilitative environment by improving infrastructure and better trade governance structures.

Multinational enterprises (MNEs) increasingly played an important role in cross-border investments especially in Asia where they sustained the trade even before the advent of regional trade agreements (Engel & Taglioni, 2017). The MNEs have been able to vertically integrate the otherwise fragmented value chains of countries across borders in Asia producing an impressive output and trade volume in the region. In the past decade, the number and operations of MNEs have increased in developing Asia. This has been fuelled by the support from the regional trade agreements and economic integration in Asia including that of ASEAN Economic Community and general growing demand for products and services globally.

2.2 Risks faced by investments and globalization of local risks

Both foreign and domestic businesses face risks from investments they make domestically and internationally and there is a vast amount of literature characterizing the risks facing their investments (for e.g. Ross et al., (2018; WEF, 2018). Foreign investments face a host of risks including supply chain uncertainties, political uncertainty, policy uncertainty, institutional incompatibility, bureaucracy, internal conflicts, corruption, cost of information, fluctuations in forex rates, supply chain risks, etc. (Busse & Hefeker, 2007; Caves, 1971; Brink, 2017). On the other hand, it has been argued that risks faced by the investments by the MNEs across the borders provide corporations to diversify risks as they operate in multiple risk contexts away and different from the risks faced in their home country. In this way, international investments provide a means of risk sharing, harder to expropriate, provides an opportunity to diversify the portfolio, and less volatile in nature (Albuquerque, 2003; Obstfeld, 1992).

What the above literature didn't consider are the new and emerging risks from disasters including those related to climate change (Blyth, et al., 2007). Disaster risks are often hard to measure, considered as standalone risks (i.e.

risks attributed to a specific component of a business that do not exist if that area of business cease to exist), and have a small probability of occurrence (The Economist Intelligence Unit, 2016). However, this may change with climate change as disasters pose a serious threat to businesses and the impacts of disasters grow on businesses necessitating a re-evaluation of risk management strategies by businesses.

It has been argued that climate change brings 'additionality' in terms of uncertainty of the risks faced by the corporations (Lee & Klassen, 2015; Weitzman, 2011), especially for the foreign investments that operate in new territories where information on local risks of disasters and climate change implications are hard to obtain (The Economist Intelligence Unit, 2016), in addition to uncertainties in physical events and uncertainties in climate policy that governments may adopt which is constantly evolving slower than businesses prefer (IEA, 2007; Weitzman, 2011). It has been argued that climate change will shift the damage distributions from a thin-tailed normal distribution to a fat-tailed distribution where predicting the losses from climatic events is more likely than normally expected and the historical data holds little relevance for future decisions and such structural changes in risks should be taken into consideration in the risk management decisions by governments and corporations (Weitzman, 2011; Kousky & Cooke, 2010).

Climate change acts as a threat multiplier i.e. climate change has the capacity to exacerbate risks that are already present on the ground especially with implications for peace and security (NATO, 2017; Ruttinger, et al., 2015; Prabhakar, et al., 2017). Another aspect of climate change is that it acts as a catalyst for risks to compound from local to global level, to a degree that the risks may escalate to the level that the states, institutions, and societies may not be able to manage them within reasonable time scale (Ruttinger, et al., 2015). Such escalation of local risks to the global level can be explained through the risk amplification framework i.e. relatively minor risks could result in substantial impacts on societies and institutions (Kasperson, et al., 1988). Kasperson et al. (1988) opined that such risk amplification depends on how the risk information is shared by the stakeholders and how the society responds to risk i.e. what kind of risk management options are employed. Ashby (2010) opined that the risks could amplify due to their very sociotechnical nature influenced by human behaviour, corporate culture, and institutional systems. A simple example of risk amplification can be seen in the financial markets during the financial crisis of 2008 (the subprime crisis) during which what seemed to be a subprime mortgage issue of home loan market in US has severely escalated to the level of bringing down the entire financial system of the world through collision of complex chain of seemingly independent events at the time. We now know, in retrospect, the

reasons why a crisis in the home loan market has escalated to the global level and why it was difficult to predict (Fox, 2013; Tamny, 2013).

Another form of risk amplification could be seen in the insurance markets where risks accumulate when one moves from the primary insurers (local insurance companies), to reinsurers to retrocessionaires. Due to the interconnected nature of insurance markets from local to the global level, only a fraction of the indemnity may remain in a country's boundaries and significant part of it may move out to the global markets. Hence, the local risk is now spread to a regional or global scale. Such an interlinked web of markets could lead to what is called 'London market spiral' or 'excess of loss spirals' whereby the gross reinsurance claims (claims made by primary insurers to reinsurers, reinsurers to retrocessionaires) may exceed that of the direct insured losses of an event (Bain, 1999; Bell, 2014; Stanard & Wacek, 1991).

The data presented in Table 1 shows selected countries against their disaster risk index, climate risk index, direct insurance claims, reinsurance claims, and FDI inflows. The disaster risk index in the form of WorldRiskIndex (WRI) presents the exposure and danger of the country's population to disasters. The climate risk index (CRI) provides a perspective of the extent to which countries are affected by climatic events. Insurance claims provide an idea on the extent of risks covered by insurance and the magnitude of insured losses. FDI flows provide an understanding of the country's ability to attract foreign investments. This information helps to establish the fact that countries with high disaster and climate risk are also the ones with significant FDI flows. It is evident from the table that the top 20 Asian countries ranked in terms of WRI and CRI have attracted an FDI of 243 and 203 billion USD respectively in the year 2016 alone (Based on data from (EM-DAT, 2018). During the same year, the total losses due to disasters in these countries were 1.8 and 51 billion USD respectively. The % of insured losses in Asia (21%) are less compared to other parts of the world (for example 60% in North America) and a significant part of these insured losses are covered by the global reinsurance markets (IFRC, 2016; Munich RE, 2017). Even though there is no data available on the proportion of FDI that are directly affected by the disaster losses, it is plausible that these investments could face similar losses as that represented by the insured losses in these countries (Escaleras & Registrar, 2011; Kato & Okubo, 2017).

Another form of globalization of local risks happens through the direct impact of disasters on investments made by MNEs that are well connected with the global markets. One recent example to cite is the Bangkok floods of 2011 that caused economic damage of 46.5 billion USD (The World Bank, 2012). Nearly 90% of total losses were accrued

to the private sector including the Japanese MNEs. More than 550 Japanese affiliate firms were affected by these floods, production facilities such as buildings and machinery were severely affected due to floodwaters (Hayakawa, et al., 2014).

In addition to the direct effects, many Japanese firms engaged in supply chain outside the flooded area were also affected by these floods. As these firms provide supplies to their factories in Malaysia, Vietnam, and Indonesia and other parts of the world, the production of these factories was also affected due to the shock to the supply chains. As a result of floods, the insured losses for Japanese firms alone were estimated to be in the range of 10-15 billion USD a significant part of which was borne by the Thai insurance companies (Meehan, 2012). Such negative shocks on MNEs in developing countries is a major issue if the foreign investments in vulnerable and developing parts of the world to make any significant difference to the economies of these countries (Kato & Okubo, 2017). The disasters in the vulnerable countries will not only impact the MNEs, they can also have a huge impact on the source countries of these MNEs, their societies, and institutions. For example, the 2011 floods induced Japan to extend reinsurance support to Thailand to help regain the lost confidence for businesses in Thailand (Bank of Thailand, 2012), encourage Thai government to provide loans to the affected firms by offering Government of Japan bonds as collateral (BBC, 2011; METI, 2012), and offered various forms of credit and insurance facilities to the affected Japanese firms (METI, 2012).

In addition, Japanese insurers were the largest affected among all the foreign insurance companies (with an estimated loss of 1.8 billion USD) (The Institute of Actuaries of Japan, 2013), the impact on the industrial production of the world was estimated to be 2.5% (Haraguchi & Lall, 2015) and 16.2% reduction in industrial production of Japan as a combined effect of floods and Thailand and Great East Japan Earthquake (METI, 2012).

Most developing countries are strengthening their reinsurance markets and hence there is a possibility that much of the risk is retained within the country's risk insurance system. However, this may introduce a different kind of risks such as lack of risk diversification for these countries (Swiss Re, 2017), and in many cases, governments are the end-of-the-border reinsurers (OECD, 2018). Due to limited financial capacities of these emerging reinsurance players, it is possible that they face enormous risks in the wake of a catastrophic event (Swiss Re, 2017). Even otherwise, a proportion of this risk will eventually be transferred to global financial markets as a process of portfolio management operations of insurance companies that invest in financial markets in diverse ways, including but not limited to securitization, retrocession, investment banking, credit default swaps etc., with potential ramifications

and dependencies they introduce (Dahlen & Peter, 2012). It is these linkages that are created between insurers and financial markets that is the cause of concern given that a significant proportion of investments are made by insurance companies in financial markets. Even though the proportion of retrocessions and securitization is very low at the moment, implications of such interdependencies would be high in the case of catastrophic events and hence it has been warned that such linkages should be thoroughly studied and addressed. In addition to these possibilities, financial markets react to disasters in terms of changes in stock market prices of not only the insurers but for other entities affected due to the disasters further exemplifying the overall financial burden (Willis, 2011; Mahalingam, 2017).

Table 1. Ranking of selected countries in terms of disaster and climate risks with their insured losses, foreign investments in 2016

Country	WRI (Rank) ¹	CRI (Rank) ²	Non-life insurance claims (million USD) ³	Reinsurance claims (million USD) ³	Economic damage (000 USD) ⁴	FDI inflows (billion USD) ⁵
Australia	4.24 (121)	42.17 (31)	22090.4	2031.9	635	47.7
Bangladesh	19.57 (5)	27 (13)	85.1	n/a	750	2.3
Cambodia	16.92 (8)	95.17 (111)	8.1	n/a	n/a	2.5
China	6.81 (80)	23.83 (12)	73942.3	41199.8	44918	134
India	7 (75)	18.33 (6)	7799.2	1889.9	2574	44.5
Indonesia	10.49 (33)	46.17 (37)	2569.5	417.8	233	3.9
Japan	13.47 (17)	57.5 (54)	45716.9	3053.0	20200	11.4
Lao PDR	5.69 (100)	109.5 (120)	n/a	n/a	0.05	1
Malaysia	6.47 (89)	65.5 (72)	3461.1	145.4	132	11.3
Myanmar	9.06 (42)	57.17 (3)	n/a	n/a	17	3
New Zealand	4.42 (119)	78.17 (96)	1372.1	4200.0	3925	1.9
Pakistan	7.11 (73)	50.83 (40)	33.9	31.9	2000	2.5
South Korea	4.80 (113)	60.83 (60)	59956.0	48555.5	274	12
Sri Lanka	7.52 (63)	11.5 (4)	277.2	122.9	1220	0.9
Thailand	6.35 (91)	37.5 (20)	3709.2	1270	145	2
The Philippines	27.69 (3)	31.33 (16)	821.9	690.6	185	6.9
Vietnam	12.84 (18)	15.33 (5)	578.0	50.6	846	12.6

Source: Compiled by author from data sources ¹(Bündnis Entwicklung Hilft, 2017), ²(Germanwatch, 2017), ³(AXCO, 2018; IRDAI, 2018; GIAJ, 2017; Jardine Lloyd Thompson, 2017; OIC, 2018; Insurance Commission, 2017; Maipark, 2017; Indonesia Financial Services Authority, 2018; APRA, 2018; CIRC, 2017) (PakRe, 2018; Korean Insurance Research Institute, 2018; IRCSL, 2018; ICNZ, 2018), ⁴(EM-DAT, 2018), ⁵(The World Bank, 2018).

To a great extent, the current discourse on climate change and international investments have tackled only the question of how international investments can help address climate change through investments in technologies, how firms can improve their competitiveness in terms of climate friendliness of their investments, and in terms of implications of climate change on trade and investments in general. However, very few, such as the statement from the Meeting of the OECD Council at Ministerial Level (OECD, 2017), reiterated the need to make international investments resilient to climate change impacts.

2.3 Understanding and communicating risk, a serious challenge

The possibility that risks can be aggregated at a certain level, magnify and impact wider sections of the society is a result of lack of clear understanding on risks, especially on how risks operate at the micro to macro scales, and lack of clear communication of risks among the stakeholders. The catastrophic risks bring an aspect of risk ignorance in the sense that the governments and institutions do not have past experience of dealing with such incidences (Castellano, 2010). The Bangkok floods of 2011 could fall into this category where the flood incident was reported to be a fifth largest flood in Thailand history and the return period for such floods is estimated to be once in five years (Gale & Saunders, 2013). Even though Thailand faced even severe floods in the past affecting even larger areas, those flood events took place in relatively distant past and in different socio-economic contexts than the 2011 floods that occurred around the heavily industrialized zone. The incident was new for that location for the existing institutional and risk governance structures.

The other possibility for risks to magnify is the lack of or deficiency in risk communication between various stakeholders, which is one of the subject matters of this paper. Risk communication has long been given advocated as an important element of any risk management strategy, probably next only after risk assessments (Jardine, 2008; Radovic & Mercantini, 2015). Enhanced risk communication increases resilience (O'Sullivan, et al., 2012), enables behavioural change, help meet ends of stakeholders at both ends (Demeritt & Nobert, 2014), and help manage risks better (Buchecker, et al., 2013). However, risk communication across different stakeholders has not made significant improvements over the years. It is especially so in areas of catastrophic risks and in designing investments. A survey conducted by A.T. Kearney indicated that disasters did not come up in the top five risk factors for investments among 302 businesses in 28 countries (Laudicina, et al., 2013). Disasters have not figured as an important element of consideration for investments in emerging markets even in the latest iterations of the survey

organized by A.T. Kearney (Laudicina, et al., 2018). Such poor consideration of disasters risks for investments is a concern given that most developing and vulnerable countries are eager to attract foreign investments.

3.0 Methodology

The arguments made in this paper are derived from the review of literature, analysis of data sources on the trends of international investments into developing and vulnerable countries in Asia, and based on the results of an online survey questionnaire conducted with the business entities in Japan (hereafter referred to as 'entities').

3.1 Structured questionnaire survey

A structured survey was conducted by posting the questionnaire on an online survey service and sending email invitations to prospective business entities in Japan to respond to the survey. The questionnaire consisted of multiple-choice questions on details of the business entity, background on business partners, risks faced by the entity, its risk assessment, and risk management operations, views on the globalization of local risks, and background of the survey respondent. 250 responses were obtained from the surveys sent out to 1000 businesses in Japan, these 1000 businesses were randomly drawn from a database containing a list of more than 500,000 businesses in Japan. The received responses were treated as opinions of the respondents rather than that of the business entities they belong to.

Cross-tabulations were prepared and survey responses were analysed using Statistical Package for Social Sciences (SPSS). Two kinds of statistical tests were done; Chi-Square test of association was done to test the significant association between different characteristics of entities and their responses. Mann-Whitney U test was done to test significant difference between groupings of entities for their responses to rated questions (e.g. rating on risk awareness among different stakeholders, risk management strategies, etc.). The overall objective of the analysis was to see if there are any significant differences and or associations between the risk management options employed by entities, and contribution to globalization of local risks by the entities based on a) size of the entity in terms of number of employees or gross revenue, b) presence of corporate social responsibility (CSR) operations, c) % of revenue from international operations, and d) disaster risk reduction standards employed by business entities.

3.2 Development of climate fragility risk index

An index to measure climate fragility risks faced by foreign investing entities has been developed using indicators that directly affect the fragility of states and institutions. The indicators were identified through literature

review and their data was collected from the sources cited in Table 2. The purpose of the index is to show the relative climate fragility of countries that may affect the investment outcomes. Climate fragility has been defined as the state of the country's capacity, legitimacy and authority level of the country's government wherein the state is not in a position to offer basic governance functions, lack ability to develop mutually constructive relationship with the society and lack ability to provide basic security to its citizens and institutions (Ruttinger, et al., 2015). The purpose of the Climate Fragility Risk Index (CFRI) is to provide a simple guide to the investing entities on possible risks facing their investments. The framework (see Figure 1) for developing this index is derived from Ruttinger et al. (2015) and Prabhakar et al. (2017) who identified underlying factors of climate fragility risks such as competition for resources, extreme weather events, migration, food price volatility and unintended effects of policies could aggravate the fragility state of countries.

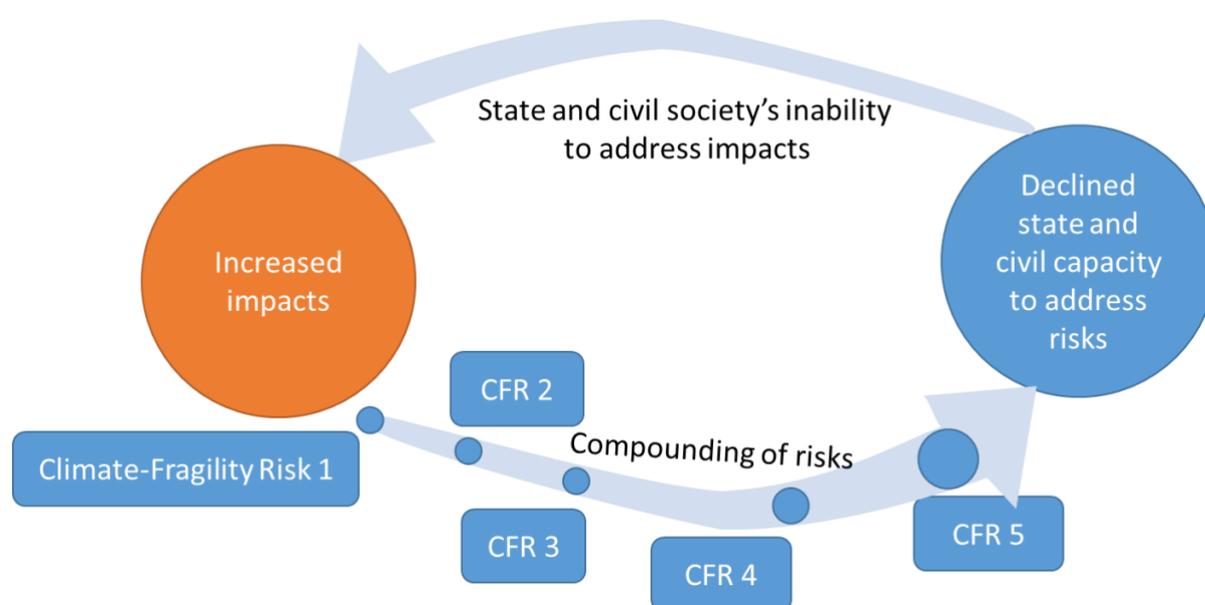


Figure 1. Risk compounding framework that affects the capacity of state and society to address risks (Source: Authors)

Table 2. List of indicators used in developing the Climate-Fragility Risk Index (CFRI)

Indicator	Proxy indicator	Rationale and limitations	Source of the data
Local competition for water	Baseline water stress	The higher the water stress the higher the competition around water. However, water stress may not always lead to tensions and conflict depending on the local governance and social systems which are represented by the governance indicator of the World Bank.	(WRI, 2018)

Indicator	Proxy indicator	Rationale and limitations	Source of the data
Extreme weather events	Climate risk index	Climate risk index is the most comprehensive risk index covering climatic hazards and has been regularly produced for most countries.	(Germanwatch, 2017)
Migration and internal displacement	% of the population affected by migration and internal displacement	The data provided by the Internal Displacement Monitoring Centre gives a clear picture of the number of internally displaced and migrants. These numbers were converted into % of the population.	(IDMC, 2018)
Food price volatility		Food price volatility was calculated as a standard deviation of principal food crop prices in the past decade in local currency.	(FAO, 2018)
Sea level rise (SLR)	% of the population affected by SLR	% of the population affected by SLR reflects social and economic impacts better than the mere change in SLR.	(Climate Central, 2015)
Unintended effects of policies	World Bank Regulatory Quality indicator	There are no verifiable measures for unintended effects of policies yet; however, the World Bank Regulatory Quality indicator provides a close assessment for policy effectiveness, assuming that least unintended effects of policies are expected with higher regulatory quality	(The World Bank, 2018)
Insured losses	Insurance claims	The insured losses shows the propensity of businesses to face losses due to various risks, including disasters. However, losses from political and social unrests may not be well represented depending on the insurance product.	Various sources (please see footnote under Table 1)

4.0 Results and Discussion

4.1 Characteristics of the investing entities and their partners

In this section, a brief background of the respondents and investing entities, as deduced from the survey, is presented to provide a context to the survey results discussed in this paper. 91% of the businesses that participated in the survey are Japanese businesses, 2.4% were American businesses and the rest belonged to China, Denmark,

Finland, Germany, Indonesia, Myanmar, and Thailand. The survey respondents were in the age group of 30 to 59 years, majority male (96%), and most of them have occupation as a manager (70%) which includes decision-making roles i.e. those who gather and process information, and are involved in business and policy decisions made by the entities that participated in the survey. Other major occupation categories are chief executive officers (10.4%), senior managing directors (7.6%), and head of business divisions of corporations (12%). This ensured that the respondents are well aware of their entity's business operations.

More than 88% of the participating businesses have overseas operations with investments in developing countries (MNEs) while only 11.6% of the respondents have fully domestic operations. Among all the responding entities, only 11.6% have some kind of joint-venture or collaboration with foreign entities, 56.8% are in the service sector, and 91% are Japanese-owned entities. Majority of the entities have operations in China (34.4%), followed by the United States of America (13.5%), Thailand (12.1%), and Indonesia (7%). Other countries where Japanese firms have investments include, each with less than 5% of total responses, France, India, Malaysia, Russia, Singapore, South Korea, The Philippines, and Vietnam. In terms of size of entities, 34% of the entities have more than 1600 employees, and 60% of the entities have gross annual revenue of 1.6 billion JPY (14.4 million USD) or more. 60% of the entities have a presence in 4 or fewer countries in Asia and 23% of entities obtain more than 40-80% of their revenue from overseas operations followed by 19% of entities with overseas revenue ranging between 20-40%. In essence, a majority of entities (70%) depend on their foreign investments for a significant part of their revenue (10% or more). 56% of entities reported having some kind of CSR operations with 58% of them reporting small to medium size CSR operations and 25% in the range of large to very large. Most of the CSR operations are in the fields of environment (24%), energy (15%), and education (13%).

The respondents were asked to evaluate the environmental, disaster risk reduction, social, financial and fiduciary standards of entities as these standards set the basis for their businesses. Majority of the respondents (46% or above) evaluated their businesses having moderately strict standards in all these areas and a relatively higher percentage of responses (76%) indicated having moderate to very strict financial standards.

Partnerships are one of the important means of expanding the reach of corporations in new markets and are an important vehicle for outward investments made by developed country entities, in addition to mergers and acquisitions (Krishnakumar, et al., 2014; Sell, 2001). Among the entities that participated in the survey, 45% have one or more partners in their international operations. 35% of the partners are from Russian Federation, 18% from China, and 13% from America. 22% of the partnering entities are from infrastructure and energy fields, majority of

them have more than 1600 employees (34%) or more than 1.6 billion JPY (14.4 million USD) in gross revenue (48%), and more than 40% of the entities have more than 40% of the stake in the overseas partnership. More than 47% of the partners have some kind of CSR activities with the majority in the range of small to medium (51%) followed by large to very large (33%). Majority of the partners (37% or more) are assessed to have a moderately strict level of environmental, DRR, social, financial and fiduciary standards.

4.2 Risk assessment, risk management, and globalization of local risks

Investments in most emerging markets have historically been seen as a high-risk area though such an outlook has been changing over the years (Laudicina, et al., 2013). 38% of the entities surveyed were found to be risk averse and prefer to not to invest in countries where investments are prone to some kind of risk. However, a significant proportion of surveyed entities are investing in vulnerable parts of the world due to competitive advantage, and the early bird incentives it provides in capturing the emerging markets (30%), while others are obligated due to 'expand or perish' situation their firms are facing (26%). Lack of risk information or underestimation of risks are some of the bottlenecks that these companies are facing (25%) even though the 'expand or perish' category of firms do not necessarily rely on risk information for their operations as they must invest despite the paucity of risk information.

MNEs are faced with several investment risks in the expanding markets and these risks could be detrimental to their operations as MNEs often do not have better grasp on the local risk factors and on the measures that may alleviate them (Hayakawa, et al., 2014; Hayakawa, et al., 2013). The MNEs that participated in this study indicated that the lack of technically skilled human resource as an important risk facing their investments that caused maximum financial impact to their operations (20%), followed by political instability (17%), social instability (11%) and disasters (10%). This is notable that these findings are in line with the findings of Laudicina et al., (2013 and 2018) and that of the Hayakawa et al (2013 and 2014) who reported a relatively lower concern for disasters when compared to other risk factors such as political risk or market risks. Consequently, the majority of the risk management interventions of the MNEs are relegated to addressing the problem of lack of technical manpower (18% of the MEIs), political and social instability (10%). Only 7% of the entities have prioritized disasters in their risk management strategy in the past five years.

Such a low emphasis on managing disaster risks could be due to the reason that MEIs consider disasters as risks that cannot be managed (37%). However, MEIs consider that climate change will exacerbate disaster risks (39%),

environmental, and social risks (20%). The risks in investments in the developing markets are increasing (45%), disasters (22%), and scarcity for technical workers (21%). The risk awareness among the government organizations of the recipient countries has been found to be less than satisfactory and hence is the major limiting factor for risk management in the destination countries (34%). In addition, sharing of risk information among the stakeholders including partners and availability of data (30%) appears to be equally limiting the ability of MEIs to assess their investment risks.

Majority of the MEIs assess their risks as a process of investment decisions (41%), while there is still a significant proportion of MEIs who either do such risk assessments only for large projects (19%) or do not conduct any formal risk assessments (25%). Among those who conduct the risk assessments, most cover social risks (41%), financial and market risks (37%), and political and environmental risks (32%). 43% of MEIs do not consider climate change in their risk assessments and only 18% of MEIs consider disasters in their risk assessments. Such limited consideration for climate change and disaster risks appears to be mainly due to lack of understanding on how such risks can be incorporated into risk assessments, lack of sufficient tools and lack of location-specific information for the countries where MEIs have planned investments.

The other challenge that MEIs are facing is in terms of understanding how their investments could be contributing to the globalization of local risks. Lack of recognition of the phenomenon of globalization of local risks and absence of mandatory requirements in regulations imposed by recipient countries (78%) are major limitations. The limited awareness among the governments about the globalization of local risks is compounding the challenges faced by MEIs (29%). This observation is especially important considering that 64% of the MEIs consider international investments to contribute to globalization of local risks (on the contrary, only 17% of the MEIs evaluated their businesses contributing to such effect), and globalization of local risks happen through compounding of risks from local to global level (55%). Climate change can further compound the local risks to the global level through international investments and trade (38%). Other factors that could contribute to the globalization of local risks include limited understanding on how risks interact with each other and expand, lack of risk information, and lack of appropriate risk management strategies to curtail local risks from becoming global.

The ineffective implementation of risk management strategies that are currently been employed to manage investment risks, in general, are also reported to contribute to the compounding of risks from local to global level. As a result, MEIs are observing unforeseen consequences to their businesses, on their partner organizations as well as the society to whom their businesses intend to serve. Consequently, their ability to manage overall risks is

severely undermined and the stability of international markets is affected. While majority of the MEIs felt that it is desirable for their entity to absorb the risks emanating from operations in the recipient country within their entity without risks spilling outside the entity (28%), others also opined that the risks should be curtailed within the country of operations (19%) or by being able to spread the risk through risk spreading instruments beyond the entity and country of operations (26%). From this, it is apparent that the MEIs prefer to spread risks beyond their own entity in order to minimize the impacts of local risks.

Majority of entities have some kind of risk management strategy (50%), and 79% consider that the strategies are moderate to highly effective. Relatively fewer MEIs reported that their strategy to address the globalization of local risks as moderate to highly effective (74%). Protection of the interests of the MEIs and their profits appears to be the main principle to achieve high success in addressing the issue of globalization of local risks (58%). Interestingly, a very small percent of MEIs considered that protection of social wellbeing would address the issue of globalization of local risks (10.8%).

4.3 Association between characteristics of investing entities and globalization of local risks

The statistical analysis of survey responses revealed the important characteristics of MEIs that may aggravate their contribution to the phenomenon of globalization of local risks (Table 3). Four characteristics of entities were tested for their influence on various aspects of business and risk management decisions: a) size of the entity (as expressed in terms of the number of staff), b) presence of CSR operations, c) % revenue from international operations, and d) the presence of DRR standards. χ^2 test of association was conducted for testing association between responses on these characteristics and a range of factors such as motivation to invest in vulnerable regions of the world, observed impact trends of disasters, contribution to globalization of local risks through the investments in vulnerable regions of the world, factors leading to compounding of risks, contribution of businesses to local risks, preference to spread the risk, propensity to conduct risk assessments, incorporation of climate change concerns into their risk assessments and presence of risk management systems.

In general, it can be observed that the characteristics of entities such as size (as indicated by the number of staff), presence of CSR operations, % of revenue from international operations, and presence of DRR standards influence the outcomes. Among these, presence of CSR operations appears to have a significant association with the propensity to choose a business partner who has CSR operations, as indicated by 84% of the entities with CSR operations reported their partners having some kind of CSR operations. Similarly, entities with CSR operations tend

to have better access to risk information than those who do not have CSR operations and are more prone to expand their operations in vulnerable regions than those who do not have CSR operations ($\chi^2=126$, $p<0.001$). A significant number of entities with CSR operations indicated to not to aggravate local risks ($\chi^2=26.8$, $p<0.001$), and reported integrating climate change concerns into their business risk assessments ($\chi^2=55.9$, $p<0.001$). These entities also tend to choose partners who conduct formal risk assessments. The complementary nature of CSR on corporations themselves have long been established as CSR enables them to engage with diverse stakeholders that provide a wealth of insights into risk assessment and management in a socially-synergistic manner (Kytte & Ruggie, 2005).

Entities with a significant proportion of their revenue coming from international operations tend to be aggressive in further expanding their international operations for reasons such as competitive advantage and operate with a notion of 'expand or perish' ($\chi^2=55.9$, $p<0.001$). However, they are also the ones that claim to not have contributed to the local risks ($\chi^2=11.7$, $p=0.020$). Interestingly, entities with stricter DRR standards tend to report that their business risks are increasing than the firms that have average or no DRR standards ($\chi^2=26.5$, $p<0.001$). These entities also have high propensity to conduct risk assessments by incorporating climate change concerns (21% points higher than firms with average DRR standards). Firms with stricter DRR standers also tend to have overall risk management strategies (24% points higher than the firms with average DRR standards and 67% points higher than firms with no DRR standards). These firms tend not to contribute to local risks ($\chi^2=16.8$, $p<0.002$), and tend to agree that the international investments contribute to the phenomenon of globalization of local risks ($\chi^2=13.2$, $p=0.01$).

Table 3. Results of the Chi-square test of association of the survey responses

(n=250)

	Size of the entity		Presence of CSR operations		% revenue from international operations		Presence of DRR Standards	
	χ^2 value	p value	χ^2 value	p value	χ^2 value	p value	χ^2 value	p value
CSR of the partner	14.5	0.024*	36.7	0.000**	9.8	0.044*	13.7	0.008*
Expand or perish	15.6	0.200	126.0	0.000**	30.8	0.000**	5.7	0.685
Observed impact trend	9.6	0.380	82.3	0.000**	6.7	0.350	26.5	0.000**
Contribution to GLR	18.8	0.005*	30.9	0.000**	10.6	0.030*	13.2	0.010*
GLR due to compounding of risks	14.8	0.020*	21.4	0.000**	9.9	0.040*	9.8	0.043*
Factors for GLR	31.2	0.028*	18.8	0.093*	12.6	0.400	11.3	0.502

	Size of the entity		Presence of CSR operations		% revenue from international operations		Presence of DRR Standards	
	χ^2 value	p value	χ^2 value	p value	χ^2 value	p value	χ^2 value	p value
Contribution to local risks	8.1	0.228	26.8	0.000**	11.7	0.020*	16.8	0.002*
Preference to spread risk	16.9	0.320	6.6	0.762	10.2	0.420	9.3	0.501
Propensity to assess risks	29.5	0.001*	17.7	0.007*	11.3	0.080*	31.9	0.000**
CC risk assessments	15.1	0.019*	55.9	0.000**	7.6	0.109	19.9	0.001*
GLR in risk assessments	18.1	0.006*	31.0	0.000**	15.8	0.003*	28.8	0.000**
Presence of a risk management strategy	49.6	0.000**	54.9	0.000**	5.9	0.205	35.5	0.000**
Partner's risk management strategy	27.9	0.000**	45.9	0.000**	15.1	0.004*	20.8	0.000**

Notes: * significantly different with $p < 0.05$ i.e. significant association between variables; ** very strong association, with p value < 0.01

All the firms that reported to be contributing to aggravation of local risks tend to include disasters ($\chi^2=4.6$, $p=0.032$), political risks ($\chi^2=10.7$, $p=0.001$), and market risks ($\chi^2=5.2$, $p=0.023$) in their risk assessments. Similarly, they also tend to include climate change into their risk assessments ($\chi^2=29.8$, $p=<0.001$) and often consider the global implications of local risks ($\chi^2=27.9$, $p=<0.001$). However, the consideration of climate change in their risk assessments appears to be either partial or qualitative in nature. Full integration of climate change into risk assessments is hindered by lack of sufficient tools, lack of location-specific information and lack of knowledge on the issue.

Mann-Whitney U test of barriers to risk management and efficacy of risk management options to address the globalization of local risks yielded some significant results. Important barriers for addressing risks in general or globalization of local risks appears to be lack of risk communication among the stakeholders, lack of awareness on the risks, and lack of reliable data to assess the risks. Entities that have international operations tend to report poor communication of risks among the stakeholders ($U=2950$, $p=0.024$), and poor reliability of data for assessing the local risks ($U=2894$, $p=0.016$) as important barriers to address risks. Responses from larger firms (firms with >800 staff) indicated the poor risk communication ($U=6398$, $p=0.01$), and unreliable data ($U=6454$, $p=0.013$) as main barriers for addressing the globalization of local risks. The larger MNEs tend to see poor awareness among the NGOs ($U=2974$, $p=0.025$), and technical institutions ($U=6335$, $p=0.004$).

Larger firms (firms with gross revenue more than 800 million JPY/7.2 million USD) tend to target risk management options based on the size of the investments as a main risk management strategy to address the globalization of local risks (U=5546, p=0.031). Similarly, risk-specific (U=4862, p=0.01), and country-specific (U=4793, p=0.006) risk management strategies are preferred by entities that have >40% of their gross revenue coming from overseas operations. Presence or absence of CSR operations appeared to make a difference in the risk management strategies employed by entities. Entities with CSR operations appeared to prefer project size-specific strategies and strategies that are more oriented towards overall capacity building and data sharing approaches. Preferences for risk management options were statistically insignificant for firms that operate within Japan and those with international operations (U=3386, p=0.290). Which means that the tendency to choose a particular risk management option does not depend on whether the firm has international operations or not. However, numerical evaluation of results indicated that the entities with international operations tend to prefer enhanced risk communication among stakeholders than other risk management options such as risk-specific risk management strategies or country-specific risk management strategies. On the contrary, more domestic entities prefer open data sharing or capacity building of firms in managing risks. Similar non-significant results were obtained for comparisons between size of firms classified according to their staff size (i.e. small firms with <800 employees and large firms with >800 employees) (U=6196, p=0.130) or whether firms routinely include climate change impacts into their risk assessments which is considered an indication of advances in corporate risk assessments (U=3706, p=0.114).

4.4 Climate fragility risk index and risks to investments

A Climate-Fragility Risk Index (CFRI) was computed to better understand how different countries in Asia perform when compared along with a set of common indicators that underscore their climate fragility. For this purpose, the number of developed countries was expanded beyond Japan to also include Australia and South Korea. Comparing climate-fragility risks in developing and developed countries helps us to understand where countries stand in terms of specific fragility risks and if the developmental status of a country has any influence on the level of climate-fragility risks. For cross-comparison purposes, indicators related to specific climate-fragility risks were identified based on inputs from an online-survey (Prabhakar, et al., 2017). These indicators formed the basis to develop the Climate-Fragility Risk Index and are presented in Table 2 along with their rationale and limitations. For building the CFRI, the following countries were chosen based on the availability of data: Australia, Bangladesh, Cambodia,

China, India, Indonesia, Japan, Korea, Lao PDR, Malaysia, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam. These indicators were transformed using linear normalization with adjusted saturation levels. Saturation levels were either adjusted to full (i.e. wherever published saturation levels are not available) or adjusted to the published maximum and minimum levels (as in the case of Climate Risk Index). All the transformed indicator values were added without weightages i.e. all indicators have equal weightage in the final Climate-Fragility Risk Index value. This is to avoid the ambiguity in applying weightages which may vary from one expert to another and from one context to another. The results were shown as a heat map using a web-based choropleth tool Carto.¹

The CFRI clearly shows that countries differ in the extent and nature of climate-fragility risks (Figure 2). This underlines the need for country-specific strategies for entities looking for opportunities to expand their businesses. The average CFRI for developing countries comprising Bangladesh, Cambodia, China, India, Indonesia, Lao PDR, Malaysia, Myanmar, Pakistan, Sri Lanka, Thailand, and Vietnam stood at 0.76 while it was 0.66 for the developed countries comprising Australia, Japan, South Korea. The differences between countries were largely due to variations in exposure to sea level rise (where Vietnam and Thailand are highly vulnerable) and food price volatility (where Pakistan scored highest). There was much less diversity regarding the indicators of internal displacement and regulatory quality of country governance systems. Among the developed countries, Australia showed a relatively high CFRI because of its high exposure to water stress and high food price volatility.

Furthermore, the analysis indicated a reasonably close association between CFRI with the per capita GDP of countries. The power relationship between these two seems to suggest a critical threshold level of per capita income below which countries tend to have higher climate-fragility risks. The relationship between the CFRI and per capita GDP strengthened with the inclusion of more developed countries in the analysis (Figure 3, Table 4). This linkage between the developmental status of countries and climate risks has already been well recognized (Hallegatte, 2013).

¹ Available at <https://carto.com/>

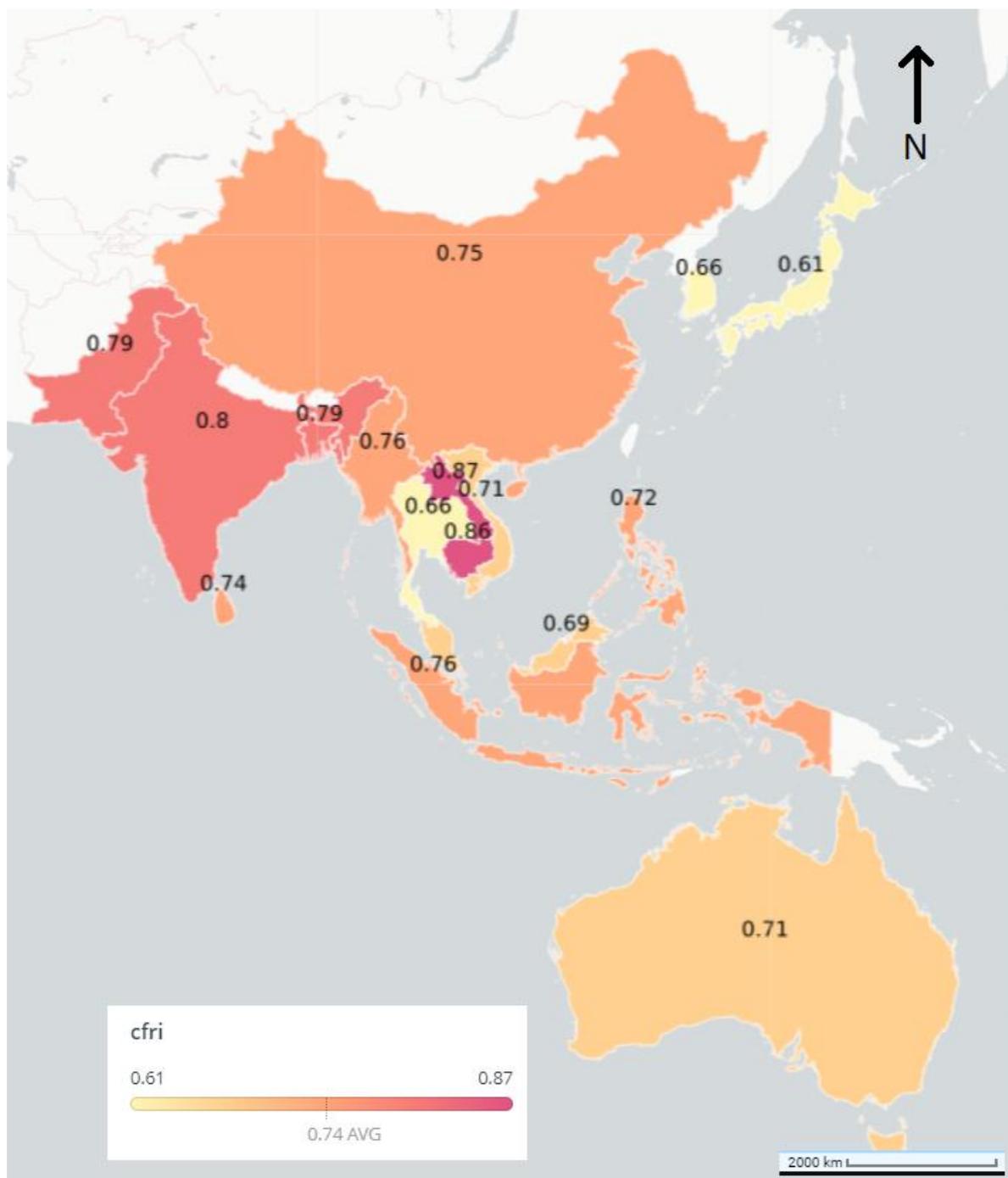


Figure 2. Climate-fragility of selected countries in Asia and Oceania

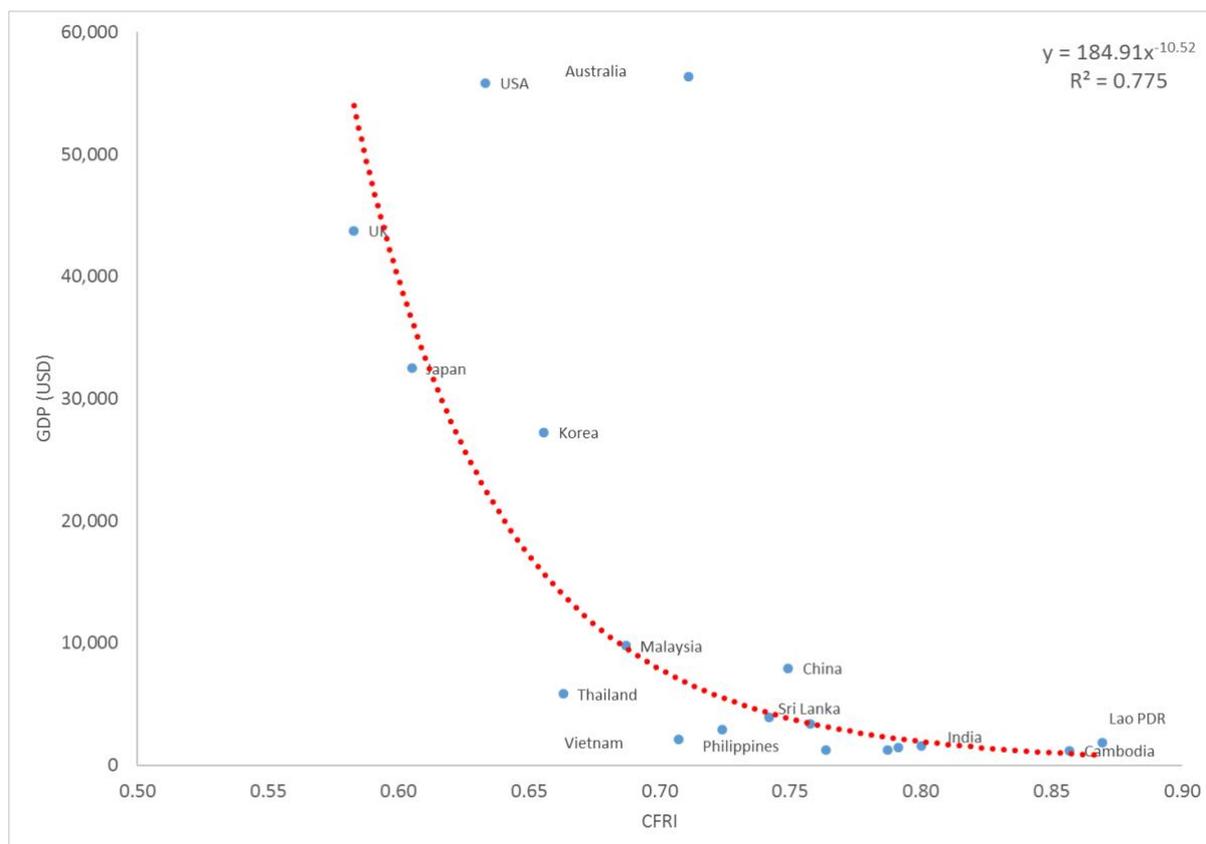


Figure 3. The relationship between GDP and CFRI of selected developing and developed countries

Table 4. Countries with Climate Fragility Risk Index and corresponding GDP

Country	CFRI	GDP
Bangladesh	0.79	1,212
Cambodia	0.86	1,159
China	0.75	7,925
India	0.80	1,582
Indonesia	0.76	3,347
Lao PDR	0.87	1,812
Malaysia	0.69	9,766
Myanmar	0.76	1,204
Pakistan	0.79	1,429
Philippines	0.72	2,899
Sri Lanka	0.74	3,926
Thailand	0.66	5,816
Vietnam	0.71	2,111
Japan	0.61	32,477
Australia	0.71	56,328
Korea	0.66	27,222

5.0 Conclusions

In this paper, an effort was made to elicit the responses from business entities that form an important part of international investments from developed countries such as Japan to developing countries. The survey indicated several pre-requisite conditions that could result in local risks from becoming global. In summary, the important factors appear to be a lack of sufficient understanding of risks in terms of how risks interact with each other, and how local risks can become global. Poor development of risk assessment methodologies, and poor risk communication among stakeholders appear to be important factors. It is evident that larger entities tend to have better risk assessments and better risk management strategies. However, factors such as poor integration of climate change risks into their business risk assessments and severe oversight of globalization of local risks mean even the investments of bigger MNEs are not far from being affected by unintended consequences of local risks. In addition, factors such as the emphasis on profits, protecting firms' interests, and expand or perish are compounding the problem. As a result, many of these international investments are in a way contributing to the globalization of local risks. There is a need for developing data sets that highlight the phenomenon of globalization of local risks and contribute to a better understanding of the issue. Better communication of risk appears to be an ultimate solution for a sector where secrecy and the risk information (i.e. data) are valued commodities. This research gives an important message that addressing the globalization of local risks is just not the business of the firms themselves but it is also the responsibility of governments and other participating stakeholders since all stakeholders are affected by this phenomenon. Similarly, the benefits of addressing the issue are not just limited to businesses but also to societies, governments, and institutions that are directly or indirectly affected by businesses beyond the boundaries of the country of investment.

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Acknowledgments

Authors are grateful that the part of this research was supported by the Environment Research and Technology Development Fund (2-1801) of the Environmental Restoration and Conservation Agency of Japan and IGES Strategic Research Fund 2018. Authors also thankfully acknowledge the valuable support provided by A. Miyatsuka, J. Murugesan, I. Okutani, T. Takeda, T. Komino, and Y. Azuma in translation, accessing businesses and popularization of the survey.