CLIMATE FRAGILITY RISKS (CFR) IN DEVELOPMENT SECTORS:

SIX PRINCIPLES FOR MANAGING SYNERGIES AND TRADE-OFFS

GUIDANCE NOTES

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CLIMATE FRAGILITY RISKS (CFR) IN DEVELOPMENT SECTORS:

Six Principles for Managing Synergies and Trade-Offs

Photo by Orendain

KEY MESSAGES

Climate change impacts on natural and human systems are increasing. Often affecting fragile economic, social and political systems, climate change is considered to be a serious 'threat multiplier'. In this document, the risks on these existing systems are understood as climate fragility risks (CFRs).

Considering CFRs in the development sector is necessary in order to address an important layer of additional current and future risks, which are largely not well understood or taken into consideration in the present development programing. The CFRs approach proposed in this document is aimed at ensuring that no one is left behind, through addressing the disproportionality that climate change impacts bring.

This document proposes six principles to manage CFRs in key development sectors, namely (1) implement interdisciplinary approach, (2) focus on vulnerable groups, (3) promote preventive and adaptive measures, (4) enhance inclusive and participatory governance, (5) allocate and manage finances for CFR effectively and efficiently, and (6) build resilient and green infrastructure.

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1 INTRODUCTION TO CLIMATE FRAGILITY: INCREASING IMPACTS OF CLIMATE CHANGE AND ITS RISKS

Conceptualizing climate fragility risks (CFRs) and the aim of the document

It is increasingly recognized that linkages between climate change and fragility exist. Fragility is connected to political and economic insecurity, poverty, inequality, resource depletion, public health, conflict and violence, increased numbers and severity of disasters, and human migration. The issues within this very complex nexus between climate change and fragility affect both the basic, immediate, human security, and the long-term development goals, essential for securing life with dignity and environmental sustainability.

The 2015 independent G7-commissioned report "A new climate for peace" stresses upon climate change as an ultimate "threat multiplier". Climate change has the potential to aggravate already fragile settings and may contribute to social upheaval and even to violent conflict. The report recommended taking action now, sending a strong message that climate change would put serious pressure on our economic, social and political systems (Rüttinger, et. al, 2015). In its 2015 report Promoting Climate-Resilient Peacebuilding in Fragile States, the International Institute for Sustainable Development, reiterated on the statement that climate change is a "threat multiplier" that has the potential to exacerbate existing challenges through:

a) increasing competition for natural resources, where climate change can lead to depletion, or redistribution, of water and food resources;

b) increasing displacement and migration of people, due to more frequent extreme weather events, more severe disasters, resource scarcity, and competition, which could also potentially escalate into conflicts, violence and/social unrest;

c) increasing the burden on state institutions, where managing the new threats would require new policies, more funds, and political will, which a number of states might not be able to easily adjust to (Crawford, et. al, 2015).

Climate change will worsen slow onset climate events impacting crop productivity, water availability, and sea level rise, leading to rising the number of migrants. That same year the UN made a global assessment on food security, concluding that climate change and conflict would be responsible for increased levels of hunger, affecting approximately 815 million people around the world. The increasing severity of weather events, such as associated with the El Niño, coupled with ongoing conflicts, and governance issues, has led to exacerbated famines and malnutrition, undermining health and well-being, but also to internal displacement and cross-country migration. In 2017, research found that "each degree-Celsius increase in global mean temperature would, on average, reduce global yields of wheat by 6.0%, rice by 3.2%, maize by 7.4%, and soybean by 3.1%". Limited resources also affect food prices, increasing economic and political volatility, as was showcased during the 2017 presidential elections in Kenya, where high food prices, following a severe drought in the country, became one of the major discussion points during the election campaigns (Vivekananda, et. al, 2017).

According to the 2015 GAR Report, by 2050, 40 per cent of the global population will be living in river basins, and a significant fraction is already living in low-elevation coastal zones already, under severe water stress (UNISDR, 2015). At the same time, a great number of people in the developing world rely on rain-fed agriculture for their livelihoods, where water resource facilities are not well developed. Rain-fed agriculture is easily affected by climate change, increasing food insecurity and loss of livelihoods. It is expected that climate change will increase flood volumes in major rivers in South Asia and South-East Asia, while at the

same time available water will decrease in major rivers in conflict-affected countries in the Middle East (Ishiwatari, 2017). Simultaneously, in other regions, the number of people exposed to droughts could rise by between 9 and 17 per cent by 2030 under scenarios where emissions growth rates aren't reduced (Winsemius, et al., 2015).

The world is increasingly divided, and some regions fall into cycles of conflict and violence (UNDP undated). Armed conflict risks are further enhanced by climate-related disasters, especially in ethnically fractionalized countries (Schleussner 2016). In the last decade, disasters and conflict have increasingly displaced people (IDMC, 2018) while in 2017 alone, there were 30.6 million new displacements associated with conflict and disasters across 143 countries and territories. In the future, it is expected that millions of people will be displaced by climate change and internal climate migrants are rapidly becoming the human face of climate change. According to the new World Bank report "Groundswell - Preparing for Internal Climate Migration", without urgent global and national climate action, Sub-Saharan Africa, South Asia and Latin America could see more than 140 million people move within their countries' borders by 2050 (Rigaud et al. 2018).

It has been widely recognized that the effects of climate change affect the poorest levels of society most severely and deepen existing, or create new, social inequalities.

Climate change affects different groups of people in different ways. It has been widely recognized that the effects of climate change affect the poorest levels of society most severely and deepen existing, or create new, social inequalities. The evidence also shows that disadvantaged groups suffer disproportionately from both direct and indirect effects of climate hazards, where the destruction of crops, for instance, is the direct loss, but subsequent raise in food prices and degraded diet are possible indirect impacts. At the same time, socially and geographically disadvantaged people – in particular people facing discrimination based on gender, race, age, class, caste and disability – are suffering the most (Islam & Winkel, 2017). Increasing demand for basic resources in countries and regions with growing populations, lack of good institutions and governance systems limiting the negative effects of increased production and urbanization, improper resource management and weak governance mechanisms will further aggravate the impacts of climate change (Rüttinger, et. al, 2015).

Furthermore, climate risks are not limited to specific countries, or communities. Climate change does not recognize boundaries, even if it affects different countries in different ways. Water resource management is only one of many examples where it is visible that the effects of climate change transcend national borders and could result in complex political struggles between states sharing the same water source. With the expansion of markets and trade, increased food and water scarcity and decreased production in one area can lead to economic losses and scarcity in other places across the globe (Rüttinger et. al, 2015). Climate change is, therefore, a shared responsibility for all countries to bear.

The G7 Foreign Ministers' Meeting held in 2016 recognized the urgency of addressing CFRs and stressed the importance of aligning foreign policy efforts in reducing fragility risks and in increasing resilience against the harmful effects of climate change (Ministry of Foreign Affairs 2017a). CFRs must be managed properly and in line with the principles of the 2030 Agenda "to leave no one behind". Two of the Sustainable Development Goals (SDG) need to be achieved in an integrated way - Goal 16 aims to find lasting solutions to conflict and insecurity; Goal 13 aims to take necessary actions to adapt to the negative effects of climate change.

In this document, the risks on the natural and human systems are understood as CFRs. Various studies cover how CFRs affect security, diplomacy and foreign affairs and how countries and international communities address CFRs. However, there is a gap in considering CFRs from a development perspective. This document aims to examine CFRs from a development perspective and to propose six principles for improved decision- and policy-making for managing CFRs.

Source: http://www.env.go.jp/earth/tekiou/report2018_full.pdf

BOX 1

2011 THAILAND FLOOD CASE STUDY: LINKS BETWEEN CFRS AND DEVELOPMENT

The flood disaster in Chao Phraya River demonstrates that climate extreme events increase tensions in various areas. The flood left more than 800 dead and damaged agricultural land of over 18,000 km2. The following tensions are observed:

1. Water use: Dams at upstream were required to perform difficult operations to reduce the damage caused by floods. Dam operators stored water as much as possible for hydropower generation and irrigation but had to reduce the water level of the reservoirs to secure more storage capacity to prepare for flooding.

2. Rural and Bangkok metropolitan areas: The government made efforts to protect Bangkok metropolitan areas, which is an economically and politically important area for the country. Temporary dykes were strengthened around the metropolitan areas but caused more severe inundation in surrounding rural areas.

3. Financial support: Some affected people, in particular those in Bangkok, complained of unfair and insufficient financial support and slow process of payment. They conducted demonstration activities and blocked highways and protested in front of government offices.

4. Political instability: All tensions became political issues, leading to political instability.

Source: TAMADA, Y., HOSHIKAWA K., and FUNATSU T., Eds. (2013) Thailand's 2011 Flood: The Record and Lessons, Josei-Bunseki Report No.22, Institute of Developing Economies, JETRO: Chiba.

2 RATIONALE FOR CONSIDERING CLIMATE FRAGILITY RISKS IN DEVELOPMENT SECTORS

CFRs are likely to undermine development efforts

CFRs affect a wide range of development sectors, such as water, agriculture, and environment, leading to complex situations of causing migration and losing livelihood (Figure 1). Disasters caused by climate change and tensions in fragile zones may damage outputs of development projects. Conducting capacity-building programs and constructing facilities are difficult in fragile and conflict-affected environments. It is even possible that development projects adversely affect fragility situations if failing to consider societal backgrounds and relationships among various groups.

Managing CFRs is crucial for the development of fragile and conflict-affected areas. Over half of the deaths caused by climate-related disasters in Asia for the last decade occurred in the four most fragile countries (Peter 2018). Fragile and conflict-affected states have limited institutional capacity in disaster risk reduction, water resource management, food security, health, agriculture, and other areas that might be affected by climate change. Furthermore, fragile and conflict-affected states may be unwilling to respond to the needs of affected people (USAID 2018).

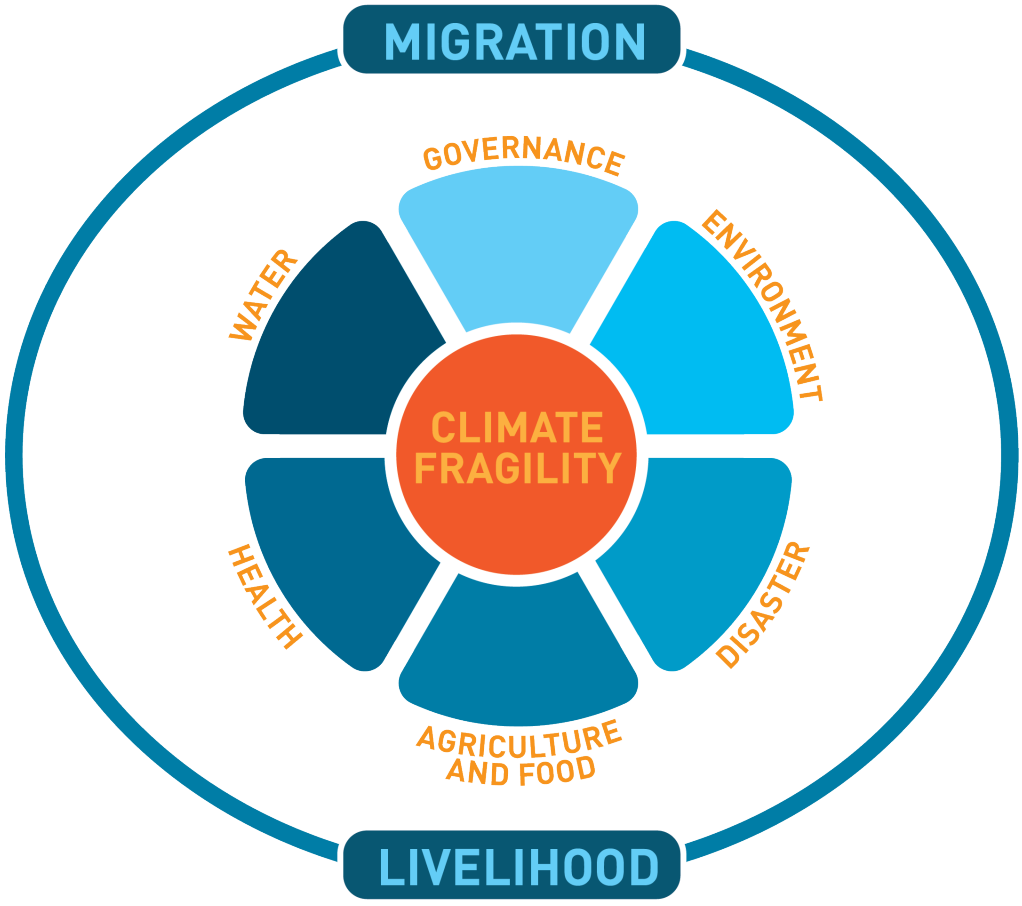

Figure 1: *Links between climate change and fragility in the development sector.*

New approaches for dealing with CFRs are needed in development programs and projects

Development projects impact local politics and power dynamics and are rarely neutral. While some of the planned impacts do provide positive results, such as improved capacity and strengthened institutions, it is very often the case that some unintended negative effects occur to undermining local capacity or differentially support some groups over other (DFID 2010). Projects should be designed according to the "do not harm" principle, by assessing the possible consequences of the planned interventions (OECD 2010). Conflict and fragility drivers should be analyzed to achieve conflict-sensitive development. Projects should be developed so as to create stability and growth by providing protection from disasters and enhance basic services and both institutional as well as human resource capacity. The existing approaches in development programing currently either do not cover CFRs or cover them superficially, where the linkages between different areas are neither well recognized nor taken into consideration. The approaches proposed here will cover:

ADDITIONALITY

Inclusion of CFR considerations into conventional approaches related to climate change. A number of approaches have been developed to address different problematic areas, such as integrated water resource management, urban water management, watershed management, and urban planning. The current document suggests incorporating CFR-planning into these already existing approaches and projects.

CONNECTIVITY

Multiple sectors should be linked. Adaptation measures and peace-building efforts involve a wide range of stakeholders and sectors. The Ministry of Foreign Affairs of Japan (2017a) points out that climate change policies should include urbanization and socioeconomic issues, as well as ecosystem conservation in the region to mitigate human security risks caused by climate change.

By taking this approach, synergistic effects can be expected, where multi-sectoral interventions will benefit a wide range of areas. Moreover, trade-offs can be managed strategically.

3 SIX PRINCIPLES FOR CONSIDERING CLIMATE-FRAGILITY RISKS IN THE DEVELOPMENT SECTOR

This document recommends six principles to reduce CFRs:

3.1 Implement interdisciplinary approach

3.2 Address the disproportional impacts on vulnerable groups and reduce inequality

3.3 Promote preventive and adaptive measures

3.4 Enhance inclusive and participatory governance

3.5 Allocate and manage finances for CFR effectively and efficiently

3.6 Build resilient and green infrastructure

The first three principles cover overarching issues, and the last three focus on sector specific: governance, finance, and infrastructure. These principles contribute to resolve major issues mentioned in this report of sectors concerned as shown in the table 1. Major issues are covered by the six principles in the report.

Table 1. *Relationship between sectors and principles*

SECTOR	MAJOR ISSUES	PRINCIPLES					
		Inter-disciplinary	Vulnerability & inequality	Preventive & adaptive	Participatory governance	Financing	Quality infrastructure
ENVIRONMENT	Resource competition	○	○		○	○	
WATER	Drought	○	○	○	○	○	○
DISASTER	Flood/ Landslides/ Storm	○	○	○	○	○	○
AGRICULTURE & FOOD	Food price/ Famine/ Hunger	○	○		○	○	○
LIVELIHOOD	Income loss	○	○		○	○	
HEALTH	Malnutrition/ Diseases	○	○		○	○	○
MIGRATION	Migration	○	○	○			

3.1 PRINCIPLE 1
Implement interdisciplinary approach

Climate change related higher temperatures, changing rainfall patterns, sea level rise, and extreme weather events in various sectors would exacerbate already fragile settings. To reduce CFRs, an interdisciplinary approach is needed to cover these interlinked areas.

3.1.1 Consider issues and solutions beyond boundaries

The conventional approaches of development projects that limit project areas are inappropriate to manage CFRs. Issues often originate outside the targeted areas, and solutions could be found outside as well. The conventional approaches from a river basin or city perspective are effective in resolving water and urban issues, but not enough to manage CFRs. Planning of river basin areas and cities needs to expand to include issues that originate outside those river basins and cities. For example, migrants could flow from risk areas. Water usage and damage mitigation had been traditionally managed by taking a river basin approach. This approach, which considers a river basin as the unit of planning and project implementation, is commonly used in water resource management and flood management (UNESCO 2009).

The challenges require new innovative approaches outside of the traditional practice. Non-traditional stakeholders could support response activities by providing relief goods and equipment, search and rescue teams, and other expert teams. Private sector should prepare business continuity plans to cope with disasters, taking into mind even disasters occurring outside of their immediate locality. Disasters, in particular large-scale ones, affect production activities and services through impacting whole supply-chains on a global scale (Ranghieri and Ishiwatari 2014). Relocation programs which move affected people from high-risk to lower-risk areas could be a counter-measure (Riguard et al., 2018).

3.1.2 Resolve multiple-risks and produce multiple-benefits

Multi-sectoral interventions will benefit a wide range of areas. Synergies between sectors can be realized by managing multiple risks in an integrated manner. For example, multi-purpose facilities of water resource development can provide water to cities and agricultural lands, mitigate flood damage, and produce electricity more efficiently than constructing specific purpose facilities separately. Capacity building programs for government organizations, civil society organizations, or other stakeholders in fragile and conflict-affected states can contribute to improve institutional capacity in a wide range of sectors including disaster risk reduction (DRR). Single sector approaches would adversely affect other sectors and areas by overusing natural resources or unbalancing development.

3.1.3 Combine knowledge of (i) Science and technology + (ii) Socio-economy for risk assessment and management

Different risk assessment methodologies used in climate change and conflicts should be integrated to formulate and implement projects for managing CFRs. The risks of climate change, such as the unavailability of water resources or flood damage, can be projected by using scientific and engineering approaches. Backgrounds and root causes of conflicts are analyzed from political, governance, security, economic and social perspectives. The current situation of these areas should be examined, and future status should be projected to understand CFRs.

Peace-building and climate change adaptation activities should be integrated as well to resolve interrelated issues of CFRs. A more integrated approach can cover various needs in the conflict-affected situations as well as adaptation of climate change. Synergy effects between engineering and socio-economic activities or between hardware and software solutions can be expected. The activities of climate change adaptation cover mainly engineering solutions, such as structural measures, flood simulation, and early warning, based on climate prediction models. Peace-building

programing covers socio-economic activities, such as livelihood rehabilitation, community-based structures, and security enhancement. An integrated approach could incorporate capacity-building activities related to natural resource management at the community level into peace-building programs, in order to contribute to climate change adaptation alongside conflict resolution.

3.1.4 Consider cross-sectoral coordination, and respond to both immediate and long-term needs

Cross-sectoral coordination could provide for the implementation of more coherent policies and programing. Business as usual, as well as template solutions, do not necessarily address complex climate-fragility challenges. Long-term activities should be designed at an early stage while responding to immediate needs. Peace-building projects tend to emphasize short-term response, such as restoring lost assets, improving access to basic public services, and rehabilitating livelihoods; and only then shifting to long-term activities. The transfer of programmatic effort from the relief to the rehabilitation phase and towards further development has often proved difficult to achieve (Hanatani et al. 2018).

Activities related to strengthening prevention and preparedness should start from the beginning of the projects. Projects should ensure that climate management activities would not undermine humanitarian issues in the long-term. Climate change adaptation is a dynamic process to be regarded as a long-term solution, since the impacts of climate change become apparent and more prominent over a long period. For this purpose, enhancing capacities and adaptive capabilities of affected communities can secure stability and sustainability of the projects by strengthening capacity from a long-term perspective. Adaptation measures to climate change can contribute to resolving existing fragility issues in addition to preparing for future changes. For example, improving efforts of managing natural resources can relieve tension among competing groups.

3.1.5 Prioritize areas

Prioritizing areas is crucial, since all issues cannot be addressed equally at the same time. Governance arrangements engaging relevant stakeholders need to be in place to efficiently design and implement risk management plans by prioritizing areas. Stakeholders share responsibilities for decisions and for implementing risk management measures. Trade-offs between different sectors or interest groups can be managed.

3.2 PRINCIPLE 2
Focus on vulnerable groups

The 2030 agenda for Sustainable Development along with its 17 goals calls for an inclusive approach toward development through leaving no-one behind. Some of the most vulnerable groups are those living in Africa, hotter region, urban areas, small islands and in developing countries, and due to climate change, it is expected that more people in these places will be affected by droughts, floods, typhoon and sea-level rise (IPCC, 2018). UN DESA (2016) concluded that multidimensional inequality leads to:

- Increased exposure to climate hazards;
- Increased susceptibility to damages caused by climate hazards;
- Decreased ability to cope with and recover from damages caused by climate hazards; and leads to a disproportionate loss of assets and income and consequently to greater inequality.

3.2.1 Identify vulnerable groups

Vulnerable groups experience disproportionately the negative effects of climate-fragility impacts, and therefore, require specific attention through a tailored approach in humanitarian and development assistance programing. ODA and other national and regional development programs should identify and take into account the different ways that complex climate-fragility factors are affecting different groups in the targeted communities. This means assessing risks based on

age, gender, disability, economic development level, social status, ethnic group belonging, and urban and rural population distribution.

On average, both the young and the old are more susceptible to damage caused by climate hazards than the adults. IPCC reports, for instance, that flood related mortality in Nepal among girls was twice as high as for women (13.3 per 1000 girls), as well as for boys compared to men (Olsson et. Al, 2014). UN DESA similarly reported that lower caste families, women and other marginal groups in the Himalayan villages in northwest India and Nepal are more susceptible to climate related effects (UN DESA, 2016).

Another type of inequality relates to public decision making (political power) and access to public resources, such as publicly financed health, education, housing, fi¬nancing, and other services. A combination of inequality factors could exist as well. For example, women in rural areas often have lower asset positions, and experience more restrictions in tenure arrangements, as well as social restrictions, which limit the land available to them. This leads women farmers to work on more marginal land that is exposed to greater climate related hazards (UN DESA, 2016).

Ethnic minorities, racial difference and indigenous groups are also more susceptible to the adverse effects of climate change. IPCC found that in many places in Latin America, Afro-Latinos and indigenous groups suffer from disproportionate climate effects (Olsson et. al, 2014). This finding, which also links to low income status, has been observed in both developing and developed countries.

In Japan, and in the ageing European nations, one of the key issues is and will be the demographic context, where elderly or handicapped persons are the ones who suffer the most from climatic changes, such as increased number of extreme weather events. During severe floods older people also find it more difficult to relocate and to adapt to changes in their living conditions.

3.2.2 Identify risk hot spots

To formulate development programs and master plans, hot spots or vulnerable areas of CFRs should be identified, and the risks should be assessed. Very often it is disadvantaged groups who live in the zones of higher risk, as they cannot afford to live in safer areas. Rural regions are usually more exposed to poverty. At the same time, it is estimated that 84 % of people in Africa, 71 % in Latin America and the Caribbean and 93 % in the least developed countries live in rural low elevation coastal zones (UN DESA, 2016). Hence it is important to identify the areas with higher exposure to climate change and fragility, and where communities have less capacity to respond and adapt.

Disadvantaged groups of people suffer disproportionately not only in rural, but also in urban areas. Temporary homes, refugee shelters and slums are very often located in areas more prone to hazards, such as low points in a city prone to flooding (India, Bangladesh), or on steep slopes (Latin America) at risk of landslides (UN DESA, 2016). Also, they have limited access to water supply and other public services. UN HABITAT estimated that there is approximately one in eight people, or close to one billion people, currently living in slums. This number is expected to significantly increase in the future (UN HABITAT, 2015-2016).

Hazard maps could be developed as an analytical tool for CFRs. The maps integrate both climate change predictions and the factors of conflicts over local resources as well as ethnic, economic, and social conflicts (Ministry of Foreign Affairs 2017b). Science and technology tools and knowledge can contribute greatly to providing better assessment of the underlying risks and the actual needs of communities.

3.2.3 Ensure that development programs do not create more inequality situations in climate-fragility settings.

The impact of development programs should be estimated by the targeted groups. A sustained effort to assess the long-term impacts post conclusion of development projects should be instituted as a standard practice in all development actions. Improper distribution of program benefits may increase already existing, or create new, inequality and cause tension among groups. A sustained effort to assess the longer term impacts post conclusion of development projects should be instituted as a standard practice in all ODA actions.

The A New Climate for Peace report paid special attention to the importance of designing development programs that consider broader impacts and possible risks. Well-intended projects can cause unexpected harms if the climate change-fragility linkages are not addressed. Such considerations include developing certain areas at the expense of others, marginalization of minority groups, exacerbating existing grievances

BOX 2

CLIMATE CHANGE AFFECTING WOMEN IN THE HIMALAYAS

Assam, in the Indian Eastern Himalayas, is an area highly affected by climate change. The mean temperature in the region has been assessed to have risen by close to 0.6 degrees between 1951 and 2010 and is expected to increase by 1.7-2.2 degrees by the mid-century. At the same time, annual rainfall has decreased by 2.96 mm per year, affecting local agriculture and fishery, which traditionally provide livelihood mainly to women. As a result, women in rural areas are disproportionally impacted by the adverse changes in the climate and the environment. As a consequence, food insecurity has risen, and income has declined for thousands of farmers in Assam, leading more specifically to:

- Women being forced to seek new types of employment, often taking the lowest-paying labor, and continue working throughout pregnancies and after childbirth, which has also resulted in poorer health.
- Women losing jobs in the traditional tea gardens due to decreased production as a result of changing temperatures.
- Women losing jobs in textile production, due to decreased quantities of silk material used for weaving, as a result of temperature rise and changed humidity.
- Young women and girls becoming more vulnerable to human trafficking, due to lower and insufficient income.
- Women and girls being cut from education, as they move to paid jobs outside of the family.
- Increasing numbers of child marriages, as parents opt for marrying their children younger in the hope of securing better life (Borah, 2017).

This case comes to show how climate change can have negative effects on groups with less social power, which is the case with women in Assam, or groups employed in particular type of activity, such as farming or weaving. It is, therefore, essential that development programs take into consideration the specific context of the area they target, as well as identify the hot spots and the specific ways that climate change affects different groups within a community.

and ethnic conflicts, degradation of biodiversity and, ironically, increasing the potential for negative impacts of climate changes. These unfortunate developments are often the cause of lack of coordination between actors and sectors, lack of understanding of the underlying risks, lack of understanding of the specific context, lack of consultation with the affected populations and communities, or adaptation efforts prioritizing certain areas over others (such as prioritizing important city centers over rural areas) (Rüttinger et. al, 2015).

To better understand the links between inequality and risks to human development UNDP has adjusted its Human Development Index (HDI) to include indicators on inequality (IHDI). The IHDI could be used as an assessment tool in development programs to inform policies about inequality gaps and their contribution to the overall human development cost, where inequalities in public health, education and standard of living lead to more fragility and decreased coping mechanisms (UNDP.2018).

3.3 PRINCIPLE 3

Promote preventive and adaptive measures

Climate fragility programing must combine both preventive and adaptive approaches, countering known threats, while preparing societies to be able to recover after emerging threats strike. Efforts to avoid harm from known problems should go in tandem with anticipating new, and at times unknown, climate change challenges. This means that more work is necessary to coordinate the inclusion of such issues as part of climate action. Particularly problematic is the sporadic attention triggered by major disasters, while excluding smaller threats, enjoying fewer mass media coverage, from the climate and disaster management cycle. The prevention and adaptation approach principle warrant a focus on needs that goes beyond shocks and pursues comprehensive protection.

3.3.1 Harmonize preventive initiatives

Promoting actions to ameliorate climate fragility must be harmonized with all other prevention efforts related to disasters, public health and public order, establishing two-way communication between relevant institutions. Addressing climate fragility should connect efforts to relevant climate change action initiatives to generate synergies and avoid duplication. There might be tensions between conflict-sensitive, climate sensitive, do no harm approaches, etc., that could be pulling in different directions while promoting prevention; nevertheless, differences should be worked out on the ground, and in line with the context.

The 2014 Ebola fever outbreak in West Africa made evident important weaknesses of international and national capabilities to respond to infectious diseases emergencies, triggering major reforms (Dubois and Wake 2015, Moon et al. 2015). The World Health Organization has merged its outbreak and humanitarian response divisions to offer a more comprehensive response, while the International Federation of the Red Cross and Red Crescent Societies has moved in a similar direction. The World Bank has also created the Pandemic Emergency Financing Facility to make more resources available when necessary.

The UN Secretary-General António Guterres has put great emphasis on the need to bolster the conflict prevention capabilities of the organization. It has been highlighted that to achieve sustainable peace, humanitarian, development, political and security initiatives are not to be implemented in isolation. The recent joint report by the UN and World Bank "Pathways for Peace" puts forward several recommendations to realize the Secretary-General's vision in relation to the joint work of peace, development and humanitarian sectors, and addressing exclusion, inequality and injustice. It should be added that in relation to food security monitoring, both FAO and WFP maintain systems for constant reporting to avert crises such as the 2011 famine in Somalia.

3.3.2 Promote knowledge co-creation

Strengthened institutions must promote knowledge co-creation with different stakeholders and utilize this knowledge to constantly transform themselves. Despite the efforts of the international community, climate will continue to change, and society should be ready to adapt to its consequences. In order to do this, coping capacities should be strengthened at all levels, from the global to the local and the community levels, with special emphasis on institutions. Knowledge societies will be in the best position to confront uncertainty as new data about climate stressors will become available in line with science development. Nonetheless, information co-creation and sharing is crucial to ensure that different perspectives about the new threats are taken into consideration and that there is a common understanding of the risks and the possibilities; otherwise, the needs of the most vulnerable or marginal communities would be at risk of being sidelined, leaving harm unaddressed.

3.3.3 Ensure a connected, full crisis management process

Adaptation to new threats is only possible if the cycle of crisis management is covered as a whole. Disconnected efforts to respond, recover and build

preparedness against future threats risk losing precious learning opportunities (Hanatani et al. 2018). These processes are not linear and represent a continuous process through which the many faces of fragility are confronted. It should be noted that the crisis management cycle is not a one-size-fits-all approach, but it serves to encompass different process triggered by crises at the local level to promote bouncing back better as much as possible. Thus, its success highly depends on the ownership and empowerment of the local actors through the full management process. In other words, a territorial approach to adaptation should be at the forefront of all efforts.

3.3.4 Addressing migration as a form of climate adaptation

Getting out of harm's way has been historically the most common approach of humans to deal with overwhelming threats. Since the 2008 COP in Cancún, México, the option of contemplating migration as an adaptation strategy has been agreed but its actual applicability is under scrutiny. Voluntary movements are preferred, yet people only consider moving as a last resort. The experience of the development sector in relocation may come in handy when large-scale movements are required, but much research is required to elucidate factors that can make such efforts successful. Since this is a major challenge, a number and a variety of preparations are required in advance. In that sense, efforts such as the Global Compact for Migration, adopted in December 2018 in Marrakech, Morocco, need also to be supported from the climate change community. How individual states react to proposals, and their willingness to cooperate on migration issues, will also determine the success of such initiatives.

3.4 PRINCIPLE 4
Enhance inclusive and participatory governance

Good and effective governance for climate change is an important tool to reduce CFRs. There are challenges in climate change adaptation governance related to institutional fragmentation due to the interdisciplinary nature of climate change impacts, or due to the uncertainties of the level of risks, or the time mismatch in developing short-term policies for long-term climate projection. Adaptation is an emerging policy field. This section proposes approaches for improving climate change adaptation governance toward reducing future climate risks fragility.

3.4.1 Aim toward inclusive climate governance

Disaster risk governance needs to strongly address reduction of poverty, inequality, access to power and information, and informality as some of the most common forms of people vulnerability to address vulnerability (Adger, 2006). In dealing with climate change impacts, literature has long suggested the importance of examining the underlying vulnerability as the root causes of disasters. To ensure and understand the dynamics of the impacts of climate change on different nations, groups and individuals calls for understanding their vulnerability to climate change.

Inclusive disaster risk governance needs to recognize those who are vulnerable and do more to respond to the needs of the world's most vulnerable people. The recent World Disaster Report from the International Federation of Red Cross and Red Crescent Societies (2018) stated that we need leave no one behind and proposed five different reasons that affected people may not receive the assistance they need: they are Out of sight, Out of reach, Out of the loop, Out of money, and Out of scope. Specifically, migration and displacement need to be taken very seriously.

3.4.2 Strengthen urban climate governance

The world is now heavily urbanized with over 55% of world population living in urban areas (UNHABITAT, 2016) and it is expected to increase to 68% by 2050 (UNDESA, 2018). The concentration of people, infrastructure, assets and waste coupled with improper land use planning has also led to an increased disaster risk. Sustainable urban development is suggested

as the key to ensure benefits from urbanization. This include managing rapid population growth, managing urban and rural linkages, managing pollution, provision of infrastructure and services that focusses on the poor and vulnerable groups and provision of decent jobs, housing, health care, education and safe environment.

3.4.3 Govern for resilience: toward adaptive and transformative climate governance

Literature on climate change governance is rapidly expanding, especially focusing on the role of network, fragmentalism, experimentation, transnationalism, multi-level governance, collaboration, partnerships and those on urban climate change governance. Bai et al (2018) recently call for long-term, cross-disciplinary studies to reduce carbon emissions and urban risks from global warming. In practice, trans-national network for cities such as ICLEI , C40, RC100, Resilient Cities campaign by the UNISDR, are taking over international stage on diplomacy and negotiations, and learning and knowledge exchange.

Building resilience to disasters is recognized as one of the ultimate goals for disaster risk reduction and management. Disaster resilience is defined by the UNISDR (2009) as the "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management". This hence calls for an integrated approach for disaster resilience. Djalante et al (2013) proposed that adaptive governing resilience is characterized by governance system that is polycentric, multi-layer, anticipative and adaptive (Djalante et al 2013). As knowledge evolve on the governance for resilience, new concept on transformation emerge. Alexander (2013) state that in the case of DRR, transformation rather than the preservation of the state of the system will be more relevant for future DRR. When resistance, and incremental adjustment to build resilience is no longer enough, then transformation in disaster risk governance policy is necessary (Matyas and Pelling, 2015). This can be done through for example transforming development and disaster risks to address the underlying roots of vulnerability, which can be done through intense interaction between actors; the intervention of external actors; system level change extending beyond efficiency to governance and goals; behavior beyond established coping strategies; and behavior extending beyond established institutions.

3.5 PRINCIPLE 5

Allocate and manage finances for CFR effectively and efficiently

Understanding the rapidly evolving landscape of development financing is important in the context of addressing CFRs. The landscape of financial sources contributing to development include public finances (national and local governments, and overseas development assistance), individual remittances, philanthropy, private sector finances, international finances, including those of the bi- and multi-lateral development institutions, including banks (e.g. MDBs). In general, financing by governments is the predominant source of development financing in most countries and its share in the overall development financing will continue to increase in the years to come due to economic growth, improved fiscal situation and improvements in governance. Over the years, private development financing through public-private partnership (PPP) and other related variants has also been on the rise. Establishing fund pools (e.g. adaptation fund, disaster emergency fund), which can address the cross-sectoral needs, have been the major approach taken by governments specially to address financing in cross-sectoral areas such as climate change and disaster risk reduction. Though such approaches have helped to reduce the increasingly fragmented developmental financial landscape, giving a single-window

option for local governments to access finances, the development sector finance is still largely fragmented. The principles described here focus on achieving additional financing for addressing CFRs and for reducing the financial costs of CFRs with increased financing efficiency and effectiveness of interventions.

3.5.1 Promote win-win approaches for improving the risk/return portfolio of interventions, and convert additional costs into incentives to ensure rapid mainstreaming of CFRs

Addressing CFRs is riddled with both risks and returns and, hence, efforts should be focused on improving the risk/return ratio of interventions. A wide range of practices can be employed including emphasis on quantifying risks, prioritizing those projects and programs that focus on the most vulnerable populations, participatory approaches by involving wide variety of stakeholders, scenario making, and by incentivizing the players. Risk identification should be part of the integral part of interventions and only those projects and programs that identify robust risk mitigation strategies should be promoted. The financial allocation for projects should be in congruence with the CFRs to be addressed by the intervention. While aiming at the lowest cost approaches, the emphasis should be given to the lowest risk approaches (i.e. win-win approaches) or those approaches that can work under wide variety of future scenarios, under which interventions are expected to perform in the future.

Depending on the nature of the fragility issue to be addressed, addressing CFRs could result in higher overall costs, compared to business as usual approaches, largely due to additional data and analytical needs, need for cross-sectoral collaboration, additional stakeholder involvement, additional technical capacities, and new interventions that may be difficult to access and may have limited 'shelf-life', requiring to be constantly reviewed and revised. In addition to financial costs, the integrated approaches may bring additional complexity to project and program implementation and related coordination that could mean employment of additional staff to address the complexity. These costs would remain additional even if CFRs are mainstreamed into sectoral approaches.

National governments could promote credit-enhancements or soft credit for interventions initiated by local governments, private sector entities, and institutions that seek to address CFRs and this could act as an incentive mechanism for integrating CFR issues into programs and projects. Mainstreaming could bring overall higher benefits with even higher net returns on investment. Cost-sharing mechanisms, including sharing costs among different departments and ministries, with private sector entities and other stakeholders could reduce the overall burden on the government, increase the ownership and sustainability of interventions. Initiatives such as public-private-partnerships (PPP) could address many issues that may arise with the mainstreaming of climate fragility issues into development and can ensure the sustainability with wider ownership.

3.5.2 Promoting result-based financing architecture to strengthen institutional deliverance

Result-based financing (RBF) refers to linking finance to prior identified outcomes that the intended financing operations aim to achieve. RBF can ensure that the payments are made only after the intended results are achieved. RBF can ensure institutional service delivery and can ensure accountability and transparency. However, due to its very nature of 'upon result' payment, the RBF may not be suitable for all the situations where CFRs may have to be mainstreamed. However, it can be effectively employed at the service delivery end in sectors such as education, health, water and sanitation, rural livelihood generation etc. Since payments can only be made upon 'verifiable' measurement of results, intangible results, which may constitute a significant proportion of CFR outcomes, may not be well recognized and rewarded. Hence, special efforts are necessary in order not to miss on the intangible results. RBF could result in additional costs due to its rigorous nature of data collection for monitoring and evaluation purposes.

3.5.3 Design insurance measures to promote risk awareness and buffers from catastrophic risks

The increasing number of innovation mechanisms in insurance sector enables development practitioners to design insurance programs for addressing CFRs. Depending on the CFR in question, unemployment insurance, disaster insurance, social insurance, health insurance, and other social protection programs can provide enough buffer to societies, governments and private sector entities. For example, the Government of the Philippines has been implementing a mandatory overseas workers insurance program (Overseas Filipino Worker Insurance) that

protects Filipino workers from economic and social risks while overseas. Such insurance programs can protect workers from unforeseen incidences that predispose them to certain risks, including ill health and unemployment. Similarly, well designed crop insurance programs and asset insurance programs can protect individuals from extreme economic losses and reduce the economic burden on governments, while enabling communities to understand and evaluate risks well and become risk aware.

3.5.4 Tap into private capital flows to bring programmatic efficiency and skill development

The advantage of engaging private sector is that they bring efficiency and effectiveness to the social programs due to the capacities and nature of the private sector operations. Private sector engagement also brings new skills and technologies to social development programs including skill development for community members. Tapping into financial resources from the enormous private sector capital for addressing CFRs is possible by emphasizing the benefits such investments can bring to the private sector. As private sector investments are constantly seeking investments in the risky regions, collaborative investments in risk reduction and other social causes can provide them a risk free political and social environment, help build trust with the consumers, and improve the overall outlook of the firms among investors and governments.

While encouraging the private sector capital flows, it is important to transparently share risk information, including that of the social and political risks that may pose challenges to private sector. While public-private partnerships have evolved as a proven means of attracting private sector investments, new and innovative approaches such as social-impact bonds (SIBs) have open up new avenues for the private sector to invest in those social programs that may otherwise be difficult to expand. As scaling up of pilot social initiatives are the best candidates for such SIBs, it is important that the messages from pilot outcomes are well designed to address questions that private investors may raise. In addition, private sector can provide matching funds with successful application in health and food sectors. All these vehicles can take private sector engagement beyond the boundary of corporate social responsibility.

3.6 PRINCIPLE 6
Build Resilient and Green Infrastructure

Physical (or Hard) infrastructure is one of the key pillars to facilitate socio-economic growth through providing people with basic services to maintain a decent quality of life and social stability. Providing basic services, such as water, transport, and health is crucial in rehabilitating people's lives under fragile situations.

The current environment still identifies a serious deficit of infrastructure needs globally and this needs to be solved, particularly through long-term investment strategies at global, country, regional, and local levels. Forecasts of global infrastructure investment needs will reach US$94 trillion by 2040 with the assumption of a population increase of 2 billion people and migration of about 46% of rural communities to cities (Global Infrastructure Outlook, 2017). To optimize such impact, infrastructure investment is also important in contributing to climate change by resilient and green infrastructure.

In addition, to tackle vulnerability and inequality, it is important to invest soft infrastructure such as policy, legislation, institutional capacity, appropriate advanced technology that contribute to providing long-term benefits to people suffering from CFRs and opportunities for empowering people. This is because: i) CFRs contribute to social upheaval and violent conflicts as well as making fragile states weaker; and ii) Climate-Fragility impacts can be mitigated by high quality infrastructure that ensures economic efficiency, job creation, improved quality of life, and boosted economic growth. There are various approaches to make infrastructure a viable asset to achieve the

SDG goals. Among others, Principle 6 will examine some of the possible actions around resilient and green infrastructure and the importance of balanced investment in soft and hard infrastructure.

3.6.1. Understand the various roles of infrastructure

One of the reasons for increased vulnerability caused by climate and fragility-induced impact is the cascading damage of critical infrastructure. Cities are becoming denser as people and infrastructure become more connected and interdependent than before. Technological developments had created smarter infrastructure and support systems. On the other hand, it becomes more important for comprehensive CFR-focused planning before considering new and expanded engineering aspects to mitigate such impacts and keep critical infrastructures operating in climate-fragility complex risk environment. In particular, integrating alternative options for providing basic services such as water and sanitation, energy, food distribution-related infrastructures, health, and education into building infrastructure planning are also critical to control resource allocations in times of emergency. For resilient city development strategies, land use planning and zoning are critical to prevent and reduce risks. This also provides more opportunities to access basic services, create more jobs, attract new business investment, and protect the environment, etc.

3.6.2 Enhance infrastructure quality

Infrastructure needs to respond to many complex challenges from a wide range of development agendas and apply them to project design, constructions, operations and maintenance, and other stages of the operational cycle. In addition, diverse funding sources for development projects change the landscape of ODA that urgently calls for global standard of infrastructure quality to achieve the SDGs. Given this environment, the initiative for Quality Infrastructure has emerged to ensure economic efficiency from multi-dimensional viewpoints such as life-cycle cost, safety, resilience against natural disaster, job creation, while addressing social and environmental impacts and aligning with economic and development strategies (from Leaders' Communique at G20 Hangzhou Summit, 2016).

In the climate and fragility risk context, it is vital to resume basic service provisions by reconstruction or rebuilding basic infrastructure swiftly but technically appropriately to secure livelihoods and keep social stability. International strategic engagement in short (emergency period) and long term (recovery to growth period) is also crucial to improve quality infrastructure initiatives. As such, infrastructure quality needs to mitigate CFRs in transparent development planning and investment and operationalization with cross-sectoral, as well as inclusive, approaches, to bring new technical and financial sources to enhance innovative infrastructure solutions.

In the context of sustainable development needs, green infrastructure should play a critical role to both quality infrastructure and sustainable economic growth. The definition of green infrastructure varies but it widely covers infrastructure considering mitigating environmental impact on natural habitats, contributing to GHG emission, also investment in clean energy efforts through energy efficiency, transport, solid waste management, and others (G-24, GGGI). In the EU, green infrastructure strategies are focused on delivering economic, social and ecological benefits and contributing to sustainable growth by implementing at regional, national, and local levels in EU countries (EC).

3.6.3 Install soft components to vitalize grey hard concrete infrastructure

Hard infrastructure comprises physical assets with returns on investment that are measurable, but they are unable to deliver optimal services without human/institutional and other non-physical assets. Strengthening such governance and institutional capacity includes: planning CFR issues in integrated, sound, mid to long-term policy and strategies; assessing probability of risks with possible scenarios; using engineering technical and operational expert knowledge and experiences; establishing sound communications channels between local authorities and communities to identify risks and needs in the communities; and others.

3.6.4 Secure inclusiveness to create a stronger and more viable infrastructure system

As cities need to become more resilient towards external shocks and extreme risks, as well as create an environment where no one is left behind, infrastructure system development also needs to consider 'inclusiveness' of different stakeholders not only at the service consumers level (downstream) but also at the development planning level (upper stream). Infrastructure system is expected to contribute to poverty reduction and protection of vulnerable groups.

Infrastructure does not always need to be combined with high-end technologies; there are

BOX 3

PROVIDING HIGH EFFICIENCY AND CLIMATE-SMART IRRIGATION IN PAKISTAN

Jalalpur Irrigation Project (approved 2017) will install surface irrigation systems for improved food security and enhanced agricultural production for a project area of 68,263 hectares (ha) of less-productive, rain-fed agricultural land on the right bank of the River Jhelum in Punjab, Pakistan. The project will help improve crop yield and reduces land degradation due to saline conditions. Farmers will be organized into 485 water user associations responsible for the operation and maintenance of watercourses and structures. The project includes the provision of high efficiency irrigation systems for more than 800 ha, and 20 water storage ponds with solar pumping stations. Training on climate-smart irrigation practices and more profitable farm management, including irrigation schedules based on crop water requirements and other techniques to maximize water productivity will be provided to water user association and 6,000 farm households.

Source; Asian Development Bank (2018) Sustainability report 2018, Investing for an Asian and the Pacific Free of Poverty, Mandaluyong, ADB.

also viable solutions by using local resources and knowledge, which could provide for more sustainable solutions. Private sector involvement would also bring substantial benefit and advantage not only for exploring new funding sources but also for introducing new innovative technologies. By doing so, a community-private interface can be encouraged and integrated. Local government authorities can optimize it to find customized infrastructure solutions. To facilitate the level of understanding on the negative impacts of CFRs and engage all stakeholders to mitigate such impacts at local level, local authority could invest resources to make necessary data available to local communities and the private sector, so that adequate inputs and decisions in infrastructure planning and investment could be made.

3.6.5 Take cross-sectoral approach and introduce safety-nets

Establishing a good governance system is urgently required and should be established during times of non-emergency/crisis, as resuming basic government's administrative function is critical to cope with emergencies. Climate-fragility risk/impact reduction systems are also required alongside with humanitarian response mechanisms. This could only be possible with a good governance system and a silo-broker approach. A silo-braking (or cross-ministerial) approach is indispensable for viable planning and investment decision-making. CFRs related incidences have no sectoral and geographic administrative boundaries. A silo-type of approach is needed to maintain expertise in each concerned agency` as its strength. But trade-off issues are often never resolved. As a modality, a single coordinating unit could be used as one of the approaches to mitigate the silo-culture. Under the single coordinating unit or leading agencies, the other concerned agencies would form a consortium. If the private sector is involved, a business model of the consortium would be key to bind them and maximize their contributions. How it should be constituted depends on the local situation. Legislation setting up the appropriate unit is critical. Unit staff also needs to be given clear decision-making authority from their line ministries. The unit needs to have capability to assess strategic (infrastructure) needs and prioritize allocation of limited resources. This would help external donors avoid overlapping efforts. Sustainability of the unit could be achieved through forming trust across unit members, accumulation of knowledge and experts within the unit, and assessment of action plans also need to be implemented.

Finally, to cope with CFRs investing money in building new infrastructure and retrofitting existing infrastructure is not enough to sustain individual and social activities. Shocks from extreme events bring devastating impacts on people and society. Without safety nets, such as solid insurance schemes, incorporating CFR mitigation strategies, disaster incidents can easily fuel grievances that lead to a great social upheaval and deprivation of resiliency towards reconstruction of society and economic activities.


Photo by Orendain

CONCLUSION

Climate change impacts on natural and human systems are increasing and affecting fragile economic, social and political systems. However, the existing approaches in development programing currently cover CFRs insufficiently.

The six approaches proposed in this document address the disproportionality that climate change impacts and contribute to sustainable development that no one is left behind. Since CFRs are deeply interrelated with various development agenda, development assistance organizations, line ministries, and civil society organizations need to take cross-sectoral and silo-breaking approaches.

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