

MAINSTREAMING NATURAL DISASTER RISK MANAGEMENT INTO SOCIAL PROTECTION POLICIES (AND VICE VERSA) IN LATIN AMERICA AND THE CARIBBEAN*

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Abstract

This paper presents and applies the social risk management (SRM) conceptual framework to examine links between disaster risk, hazards, vulnerability, risk management, and social protection (SP). The paper makes the case that it is important to mainstream social protection policies into the disaster risk management (DRM) agenda and, vice versa as a means to improve household and community resilience to natural disasters. The paper proposes different types of actions that can help households and communities better manage risks related to natural hazards, especially by promoting SP policies and programs that could reduce vulnerability through various ex-ante actions that strengthen assets and livelihoods, and improved “planned coping”, which are ex-ante interventions that help households and communities recover and reconstruct assets and livelihoods after a hazard event is manifested.

— Key words: Natural disasters, disaster risk management, social risk management, social protection, vulnerability, resilience, planned coping.
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Introduction

Latin American and Caribbean (LAC) countries are in constant threat of experiencing natural disasters, and are among the most exposed to hazards in the world (see De la Fuente in this volume). Moreover, recent evidence and predictions indicate that climate changes are accelerating and will lead to wide-ranging shifts in climate variables (UNISDR, 2009a), with the consequent increase in extreme weather events, declines in food and agriculture production, and increased water scarcity. Furthermore, there is mounting evidence (including various papers in this volume) that such weather risks and their impacts increase poverty. This is why effective risk management policies are needed.

Many interventions prior to, and following natural disasters have focused on investments to improve infrastructure, such as climate-proofing of specific projects and investments in basic infrastructure (e.g., roads, communication, water reservoirs, energy), and/or emergency response to restore basic services (e.g., electricity, water, transport). Valuable as this is, there has been insufficient attention to people-oriented investments such as asset and/or livelihood protection (ex-ante) and recovery (ex-post) as a response to natural disasters. It has been increasingly recognized that asset and livelihood support, targeting households and communities, during the recovery phase can help during medium-term reconstruction efforts, and that the success of these efforts are largely dependent on ex-ante investments and contingency plans and financing¹ (IEG/World Bank, 2006).

Disaster risk management (DRM), traditionally associated with post-disaster actions, has been increasingly focusing attention on risk reduction. Social protection² (SP) policy has traditionally been identified with DRM only in the context of emergency responses, and less in the context of interventions that reduce vulnerability to disaster risks, and that also address wider sources of poverty. Hence a desirable aspect of the links between DRM and SP is to broaden the current menu of responses based on the frequency and severity of hazard events,³ to include pre-disaster actions both for risk reduction and coping. In other words, governments should reconsider the timing and purpose of their SP interventions. As such, the paper advocates synergies between SP

¹ Throughout this paper we refer to contingency plans and financing arrangements as ex-ante planned activities that facilitate improved ex-post DRM after a hazard event takes place.

² Social protection (SP) includes different types of interventions aimed at supporting the poorer and more vulnerable members of society by strengthening assets and livelihoods, and improving capacity for risk management. Examples include the provision of basic social services, conditional cash transfers, safety nets, public works, food/nutrition aid, social insurance, social funds, and labor market policies (Holzmann and Jorgensen, 2000; Grosh et. al., 2008).

³ Traditional social protection responses to insure against risk are based on the frequency of the risk faced (from rare to constant) and the size of the loss resulting from the risk (from small to catastrophic). So governments should step aside when losses are small and rare and informal mechanisms can crop in, and become increasingly involved as the size of potential losses increases (i.e., workfare or unemployment insurance in response to job loss). Similarly, rare losses can be dealt with through risk-pooling (insurance) whereas high and frequent losses are most effectively addressed via social assistance transfers (i.e., transfers in responses to income volatility due to informal employment or permanent income loss due to old age). (See World Bank, 2005).

and DRM to proactively manage disaster risks (timing), by preventing and/or lessening losses, and to also strengthen assets and livelihoods to increase household and community resilience (purpose). In this manner, the approach taken in this paper is to explicitly address how SP can help facilitate the Hyogo Framework objective of “reducing the underlying risk factors.”⁴

Different types of projects aiming to build hazard resilience of the poor are being implemented in many countries of the LAC region, and this is a cause for some optimism. This includes social funds and community based development (CDD) support for community-based adaptation; safety nets for coping with climatic risks and natural disasters; livelihoods programs; microfinance; and weather index insurance (see for example Yamin, Rahman, and Huq, 2005; Vakis, 2006; Tanner and Mitchell, 2008; Davies, et.al., 2008; Heltberg, Siegel, Jorgensen, 2009; World Bank, 2009). All these interventions add a DRM dimension to SP, which has traditionally focused on the chronic poor, and to a lesser extent on the transient poor. A robust SP policy response rooted in an understanding of the hazards/vulnerabilities/risks associated with disasters facing poor and vulnerable (non-poor, but possibly transient poor) households can help overcome this gap in safety nets by greater integration with DRM.

This paper attempts to bridge the concepts, knowledge and practice of SP and DRM policies and programs. Differences in semantics and approaches in the SP and DRM communities (academics, policymakers, community practitioners) limit the ability to formulate effective anti-vulnerability and anti-poverty strategies. Also, some of the SP and DRM literature lacks attention to micro level impacts, and how risks associated with natural hazards affect household assets, livelihoods, and well-being. Furthermore, few studies of disasters and SP interventions are consistent in the use of key terms such as risk, vulnerability, and adaptation and how these terms are interrelated. For these and other reasons, there is limited understanding of how to mainstream DRM and SP.

To facilitate greater conceptual, analytical and operational links between DRM and SP, we apply the social risk management (SRM) framework (defined below) with the explicit goal to identify SP interventions to reduce vulnerability to disaster risks (and thereby also be considered DRM activities). The major contributions of the paper are: (a) present SRM as a unifying conceptual and definitional framework that links DRM and SP with respect to disaster risk, hazards, vulnerability, and risk management options; (b) apply the framework to present and examine different DRM and SP interventions; and (c) propose an agenda for further research.

This paper is organized as follows. The next section presents key definitions and the SRM conceptual framework. Section 2 applies the conceptual framework to examine key underlying issues, and SP policies that lower vulnerability and can help facilitate resilience and improve DRM, and also presents some examples. In closing the paper, Section 3 proposes a research agenda, and Section 4 concludes.

⁴ See <http://www.unisdr.org/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf>.

1. Definitions and Conceptual Framework

We introduce the social risk management (SRM) conceptual framework and risk-vulnerability chain using definitions drawn from UNISDR (2009),⁵ as presented in the Annex, with some clarifications/modifications.⁶

1.1 Social risk management (SRM)

The social risk management (SRM) framework, provides a conceptual framework to examine how society manages risks (see Siegel and Alwang, 1999; Holzmann and Jorgensen, 2000; Heitzmann, Canagarajah, and Siegel, 2002; Holzmann, Sherburne-Benz, and Tesliuc, 2003; Heltberg, Siegel, Jorgensen, 2009). The SRM framework is an integral conceptual framework for the World Development Report 2000/2001 (World Bank, 2000) and the Social Protection Strategy Paper (World Bank, 2001), that differentiates between risks, hazards, and vulnerability, also known as the risk-vulnerability chain, explained below. The SRM framework proposed the use of social protection (SP) instruments as a “springboard” for poverty-reducing growth by focusing attention on assets and livelihoods and not just income/consumption.

A major contribution of the SRM framework is the differentiation between ex-ante actions taken before an event occurs and actions taken ex-post, after an event takes place. Ex-ante actions can prevent negative events from occurring and/or reducing the negative impacts of such events, and/or ex-ante actions can set up different types of formal or informal arrangements to provide compensation for losses in the case of a negative event taking place (e.g., liquid savings and insurance). As such, the SRM framework focuses attention on helping households to manage hazards ex-ante rather than depend on ad-hoc ex-post coping responses.

1.2 SRM risk-vulnerability chain⁷

The risk-vulnerability chain conceptualizes the relationship between risks, risk management arrangements, and household vulnerability (Figure 1). Different studies define risk and vulnerability

⁵ See UNISDR (2009b) <http://www.unisdr.org/eng/terminology/UNISDR-Terminology-English.pdf>.

⁶ Note, the usual SRM terminology **Vulnerability = Risk x (Exposure and Sensitivity) – Capacity** has been changed from Heltberg, Siegel, Jorgensen (2009) to be consistent with UNISDR (2009) definition of: **Disaster Risk = Natural Hazard x Vulnerability – Capacity**. See the Annex, and following sections for details on definitions.

⁷ Heitzmann, Canagarajah, and Siegel (2002); and Heltberg, Siegel, and Jorgensen (2009) developed the SRM risk-vulnerability chain (but use different definitions of the terms). The presentation in this paper follows Heltberg, Siegel, and Jorgensen (2009), but is adjusted to use the UNISDR terminology.

and other key terms of the SRM risk-vulnerability chain differently.⁸ Below we present those definitions as understood by DRM and SP:

Equation (1): Disaster Risk = Hazard x Vulnerability – DRM Capacity

Equation (2) Vulnerability = f(Risks, Exposure and Sensitivity, DRM Capacity)

Equation (1) is the conceptual and semantic framework usually used by the DRM practitioners whereas Equation (2) is the conceptual and semantic framework usually used by SP practitioners that have adopted the SRM approach.⁹ To facilitate the understanding between DRM and SP practitioners based on a consistent set of terms, the paper will use Equation (1), above while integrating SRM concepts. Thus, what we will call *Hazard* (meaning the probability of an adverse event) is called *Risk* in the SRM literature (and often in the climate change community); what we call *Vulnerability* (meaning the susceptibility of assets livelihoods to hazards) is called *Exposure and Sensitivity* in the SRM literature; and what we call *Disaster Risk* (meaning the probability of losses is akin to the SRM concept of *Vulnerability*). Not surprisingly, there is a good deal of confusion as few studies are explicit and some are inconsistent in use of terms.

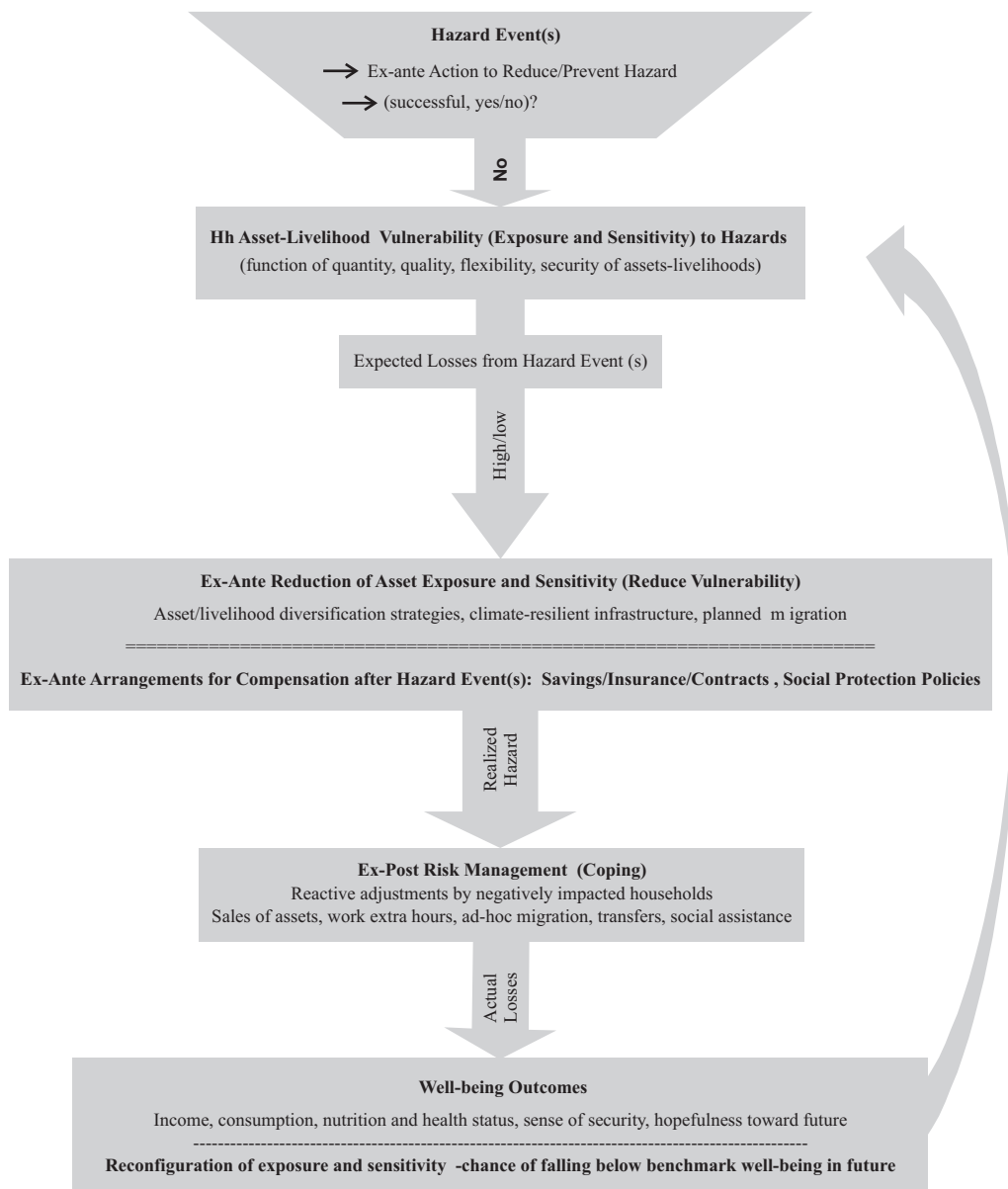
These different sets of definitions can be integrated into a single framework, moving from SRM terminology to DRM terminology (which is what we attempt to do). We take the position that the differences are more semantic than real and that both traditions inherently aim to understand and address the causes of vulnerability and how to reduce it. It is important to identify the complementarities to facilitate better communication and cooperation between practitioners working on natural disasters, social protection, and livelihoods promotion.

The hazards and the exposure and sensitivity of assets and livelihoods to them together determine expected losses. Households use risk management strategies that are either ex-ante (prevention, reduction, compensatory arrangements) or ex-post (coping) actions. Risk, the probability of a loss of well-being, depends on the hazards, exposure and sensitivity, expected impacts and losses, and ex-ante and ex-post risk management strategies. We now briefly introduce a schematic presentation of the SRM risk-vulnerability chain (See Figure 1), followed by definitions of its components.

⁸ For different definitions of vulnerability in the literature see Alwang, Siegel, and Jorgensen (2001); Siegel, Alwang and Jorgensen (2003); Adger (2006); and Schipper and Pelling (2006).

⁹ The International Panel on Climate Change (IPCC) and many practitioners dealing with climate change use Equation (2). Another cause of confusion, but also an indication of the potential for integration of concepts and terminology with DRM and SP (Siegel, 2008).

Figure 1
The Risk-Vulnerability Chain



Hazard. Hazard is an event that can cause danger, damage, loss, injury, or any other undesirable consequences for a household (or an individual or a community). Hazards can also interact. Many disaster risks are the result of linked hazards and have inter-related impacts. Moreover, losses associated with natural hazards interact with other hazards stemming from, for example, markets or policy failures.

Vulnerability (Exposure and Sensitivity of Assets and Livelihoods). Households' risk exposure and sensitivity depend on their asset portfolio, asset allocation, and livelihood strategies (e.g., crop and livestock mix and varieties, diversification of farm and off-farm or non-farm activities). The risk exposure and sensitivity of households is based on their asset and livelihood decisions, which are shaped by the policy, institutional, and structural context outside their control.

Expected Losses. The expected losses from any hazard depend on the probability of a hazard event occurring and the exposure/sensitivity of assets/livelihoods. Expected losses denote the severity of potential negative impacts from risks before a hazard event is manifested and before any ex-ante or ex-post risk management.

Risk Management Strategies: (ex-ante and ex-post). Households and societies manage risks through multiple complementary strategies that can be taken independently by households and/or through planned societal actions. These strategies all have real and opportunity costs and can be separated into *ex-ante* (before a hazard event occurs), and *ex-post* strategies (after a hazard event has occurred).¹⁰ Risk management, if successful, results in increased *resilience*, the ability to avoid the negative impacts of hazard events and to recover from them.

Ex-ante risk management strategies: Prevention or reduction. Actions to reduce the probability of hazard events (e.g., cloud seeding to change rainfall patterns); Reduction of exposure and sensitivity reduction: actions to reduce household vulnerability to given hazards (e.g., asset and livelihood diversification); arrangements for compensation if there is a future hazard-generated loss (e.g., formal insurance, holding of savings, and social networks), and planned coping, explained in Section 2.1.

Ex-post risk management strategies. Coping actions are taken to compensate for losses after realization of a hazard event. Coping costs are rarely shared equally within households but borne according to age, gender, and status (for example, poor households forced, withdraw boys or girls from school, or reduce food consumption of some members). In many cases, for poor and vulnerable households, ad-hoc coping (see below) results in the degradation of assets and reduction of livelihoods and well-being, and a downward spiral that might even be irreversible (or require a long time for recovery). *Ad-hoc (i.e., unplanned) coping* after a hazard event is realized and arrangements for compensation either do not exist or are insufficient to cover losses.

¹⁰ The costs of risk management are often overlooked. Yet both ex-ante and ex-post risk management have real and opportunity costs, even as the risky event may not occur or, if it occurs, ex-ante actions may not have success. It is also often overlooked that even the best of ex-ante strategies need to be complemented with ex-post coping (insurance, for example, rarely compensates the entire loss).

Risk is the expectation of losses of well-being should a hazard event occur. Well-being proxies such as poverty lines and health and nutritional status are often used as a benchmark to determine the severity of a loss relative to the overall well-being indicators. Thus, an individual or household is considered “at-risk” if the hazards can result in a loss that pushes the household below the well-being benchmark (say, the poverty line). In our definition, risk depends on the characteristics of the vulnerability (exposure and sensitivity) to the hazards; expected impacts and losses; and risk management capacity.

1.3 SRM policy matrix for disaster risk management

SRM comprises a wide range of interventions and strategies at the household, community, national, and international levels aiming to prevent hazards from occurring and/or reducing their negative impacts; both ex-ante or ex-post the realization of a hazard event (Siegel and Alwang, 1999; Holzmann and Jorgensen, 2000; Heitzmann, Canagarajah, and Siegel, 2002; Holzmann, Sherburne-Benz, and Tesliuc, 2003; Heltberg, Siegel, Jorgensen, 2009). There is a menu of formal or informal instruments, from public and private sectors and civil society, and no single instrument alone offers complete protection. As Table 1 demonstrates, efforts by households, communities, and nations need to be complemented by international responses. The policy menu should also balance between ex-ante risk prevention, exposure reduction, and risk compensation with support for ex-post planned coping. The key is identifying instruments that are appropriate for given risks given a society’s formal and informal “contracts” among citizens and between citizens and government, and their financial capacity.

SRM strategies seek to reduce the vulnerability (and increase the resilience) of households (and communities) through a menu of instruments and focus attention on replacing detrimental asset-degrading ad-hoc coping strategies (e.g., withdrawing children from school, delaying health care, distress asset sales) with ex-ante mechanisms (e.g., insurance, weather forecasts) that help anticipate impacts and address risks. SRM strategies include a broad range of interventions (for example finance, insurance, ecosystem management, health, nutrition, education, safety nets) that can protect and strengthen assets and livelihoods, and help manage the risks associated with natural hazards.

Thus, there are different “instruments” available to manage risks, both ex-ante and ex-post, at different levels (household, community, national, international). The focus of attention for SRM is to improve household and community resilience, while recognizing that policies and investments at higher levels (e.g., national and international) are critical. It should be noted that some of the items under ex-post coping in Table 1 (e.g., safety nets, social funds, and community-driven development (CDD)) can actually be planned versus ad-hoc coping which has critical implications for linkages of households and communities to the higher levels.

Table 1
SRM Matrix of Interventions to Manage Risks Associated with Natural Hazards

	Individual and household level	Community and local level	National level	International level
<i>Ex-ante (before the hazard events)</i>				
Risk prevention	Cloud seeding to change rainfall patterns, reduce emissions causing climate change			
Reduction of exposure or sensitivity	Investments to protect and enhance household assets; Adopt new technologies; Adjust assets and livelihoods; Permanent migration; Health and education.	Investments to protect and enhance community assets; Investments in physical and social infrastructure; Social capital; Rights and security; Water and sanitation.	Climate proof technologies and infrastructure; Climate predictions and forecasts; Public goods, physical and social infrastructure; Finance, technology, knowledge for producers; Human capital; Safety nets for assets / adaptation.	Research in climate proof technologies; Well-functioning international markets (e.g., in food); Options for permanent international migration; Climate predictions.
Ex-ante Compensation Arrangements for Potential Hazards	Insurance; Adjust asset portfolio and livelihood activities; Precautionary savings; Seasonal migration.	Mutual insurance; Markets for households' assets; Physical and social infrastructure; Community savings and insurance.	Markets for household assets; Finance and insurance services development; Formal insurance; Migration.	International insurance; Predictable disaster assistance (with funds and rules for targeting & delivery); Options for temporary migration.
<i>Ex-post (after hazard events)</i>				
Ex-post coping	Sell or draw down assets; Increase labor supply; Credit; Receive transfers.	Draw down community assets; Transfers from outside community.	Safety nets; Social funds/ community-driven development.	International disaster assistance (ex-post).

Source: Adapted from Siegel and Alwang (1999) by the authors.

2. Applying the Conceptual Framework to Social Protection Policies for Improved Disaster Risk Management

We now apply the SRM conceptual framework, to examine social protection (SP) policies that can improve disaster risk management (DRM) within countries (and even between countries, and globally). Identification of the convergence and overlap between DRM and SP can help promote adoption of SP and DRM strategies that avoid the loss of human lives and the loss of assets and livelihoods, and a cycle of poverty and vulnerability (as described in Figure 1). We present SP policies along the two factors which we believe should guide their deployment: the timing and purpose of interventions and their contribution to increasing household and community resilience. In this context, we focus attention on the need for pre-disaster actions (i.e., the timing) for both risk reduction and coping (i.e., the purpose). Matching these categories we arrive, first, at planned coping (Section 2.1) which among other things entails that safety nets need to be in place before hazards strike, because trying to put in place safety nets after a hazard strikes is often impractical and ad hoc. And secondly, we arrive at pre-disaster SP actions with components that prevent natural disasters (Section 2.2), given that safety nets never fully compensate for losses.

2.1 Planned coping

Conceiving a safety net well before a disaster strikes is likely to render various benefits at short notice, including the provision of relief and rehabilitation assistance to those affected by a variety of adverse events, whenever and wherever they may occur, protecting long-earned gains in well-being.

Most safety nets programs have traditionally targeted the chronic poor and safety nets for natural disasters are relatively underdeveloped. But there is growing interest in using safety nets to help avoiding post-disaster famine and in assisting affected households and communities protect and rebuild their assets. Cash transfers, both conditional and unconditional, workfare programs, and in-kind transfers are some of the available instruments. It makes sense to prepare for better design and swifter and more equitable and consistent deployment after disasters, and the key preparatory step is to build country capacity to deliver cash transfers or execute public works after natural disasters. The same capacity can be used to cope with manmade shocks such as food, fuel, and financial shocks. Countries and donors should incorporate this into their disaster preparedness.

Disaster preparedness is usually viewed as the set of activities and measures taken before hazards occur to forecast and warn against them, to evacuate people and property when threatened, and to ensure an effective response, and consists of planning and institutional development. On the planning side efforts concentrate on *good analytical frameworks and information systems* to understand what disasters entail for those who experience them. And on institutional development, the other priority in disaster preparedness, the key is to have programs in place before the onset of natural disasters, with *flexible targeting, implementation arrangements, and financing* (de Janvry, et al, 2006; Alderman and Haque, 2007).

2.1.1 Good information systems and analytical framework

There is a need to better understand the risk-vulnerability chain facing poor households and communities; the potential impacts on household well-being and social outcomes; and how to effectively lower household vulnerability and increase resilience. Mapping the risk-vulnerability chain at various levels (e.g., from household, community, local and up) can be enhanced by recent technological advances on the collection of hazard and vulnerability data through satellite technologies and applications of geographic information systems (GIS) and spatial data infrastructures (SDI). The Central America Probabilistic Risk Assessment (CAPRA), a World Bank partnership with the Inter American Development Bank and other agencies and institutions in several Central America countries, is an example of a broad multi-sectoral database and risk modeling platform (see www.ecapra.org) based on the use of GIS and SDI.

Many of the shortcomings in our understanding of the potential effects of SP interventions to protect against the impact of natural disasters stem from the lack of appropriate data and analysis. In the future, it is important to incorporate special “risk modules” and social protection modules as a feature of regular household surveys, like LSMS, and link them to objective data of disaster occurrence such as rain and water flow data (i.e., hazard data), ground shaking motions in earthquakes or declaration of disaster areas by local authorities; additionally, recent advances in poverty mapping techniques have improved the identification of at-risk and vulnerable populations (Vakis, 2006; Hoddinott and Quisumbing, 2010).

Good information systems are also needed to monitor the long-term effects of disasters because those households and communities impacted might remain vulnerable for considerable time, with longer-term negative consequences. This could be especially problematic during slow-onset disasters like droughts. It is equally important to measure the effectiveness of SP programs over time, which requires good baseline data. On the other hand, a disaster averted does not register as a “statistic”, and analytical techniques are needed to measure successful SP programs, in terms of negative impacts that are avoided. The lack of appropriate analytical techniques to model “losses avoided” continues to be a major constraint to determining optimal investments in ex-ante risk reduction.

2.1.2 Flexible targeting and institutional arrangements for scaling up of existing social protection programs

Many LAC countries have adopted different types of conditional cash transfer (CCT) programs and/or workfare (i.e., public works) and/or social funds for community driven development projects (see Table 2). These types of programs offer a good target base for poor and vulnerable households that can be scaled up if there is a hazard event. The advantage is that there are large databases that provide information on poor and vulnerable households and communities.

Table 2
Examples of Social Protection (SP) Programs in LAC, that Might be Scaled up for Disaster Risk Management (DRM)

Country	CCT	Workfare	Social Fund
Argentina	Programa Familia 0.27% GDP (2007) 504,784 families (2007)	Jefes y Jefas 0.13% (2007) 800,000 individuals at the end of 2007	
Bolivia	Juancito Pinto 0.27% GDP (2006) 1.2 million children	PLANE "Red de Proteccion Social"	Fondo nacional de inversion productiva y social 0.5% GDP (2005)
Brazil	Bolsa Familia 0.36% GDP (2006) 11.1 million families (June 2006) & 2) BPC- Disabled assistance 0.27% (2005) 1.212 million people		
Chile	Chile Solidario 0.08% of GDP (2005) 256,000 families	Programa de Empleo Directo	
Colombia	Familias en accion 0.2% of GDP (2007) 1.7 million families end of 2007	Empleo en Accion (Red de Apoyo Social)	Manos a la Obra
Dom. Rep.	Solidaridad 0.34% of GDP (2006) 243,100 families (July 2007)		
Ecuador	Bono de Desarrollo Humano 0.6% of GDP (2006) 1,060,416 families (Jan 2006)		Emergency Social Investment Fund
El Salvador	Red Solidaria 0.23% GDP (2007) 24,106 families		El Salvador Social Protection Project
Guatemala	Mi Familia Progreso		Social Investment Fund Project
Honduras	Programa de Asignacion Familiar 0.2% GDP (2007) 240,000 families		Nuestras Raices Program
Jamaica	PATH 0.2% GDP (2007) 240,000 families		National Community Development Project
Mexico	Oportunidades 0.4% GDP (2006) 5 million families (2006)	Programa de Empleo Temporal (PET)	

Table 2 (continued)

Country	CCT	Workfare	Social Fund
Nicaragua	Atencion a Crisis; RPS		Poverty Reduction and Local Development Project
Panama	Red de Oportunidades 0.15%GDP (2007) 90000 families (2007)		
Peru	Juntos 0.11% GDP (2006) 319,684 families (end of September 2007)	A Trabajar Urbano 0.07 % GDP (2006) 57,000 beneficiaries, A Trabajar Rural & 2)Construyendo Peru	Social Development & Compensation Fund Project 0.24% GDP(2006)
Uruguay	Workfare	1) Plan de Atencion Nacional a la Emergencia Social (PANES) & 2) Programa de Actividades Comunitarias	

Victims of a disaster are not necessarily identical to those that an existing SP program is designed to protect. Ensuring that only the intended disaster-impacted beneficiaries receive the benefits requires appropriate targeting mechanisms and administrative checks. While normal times allow a wide discussion of whom the intended beneficiary should be (e.g. rural poor, all poor) and a careful choice of the checks, after a disaster, victims need to be reached quickly and effectively. The government's choices could be limited by what SP programs they have in place, hence they should be well organized beforehand to have a good safety net that can be scaled-up (for existing beneficiaries) and expanded (to include persons not benefiting from existing programs).

It is not very common for existing SP programs to have contingency arrangements in place for scaling-up (Grosh et al, 2008). There are both political and technical challenges to moving this agenda forward. Technically speaking it remains hard to reach those most affected without giving support to those that should not receive benefits. Safety nets usually employ means testing and geographic targeting to identify the structurally poor and thus could fail to identify the temporary poor generated by a natural disaster (Skoufias, 2003). It seems more appropriate to combine geographic allocation criteria followed by some form of individual or group targeting.

Political challenges also remain with questions on the effectiveness of SP and on the merits of different targeting strategies. The political support for spending money on the poor, and in particular on recurrent (non-investment) items such as social protection, is sometimes weak. Better impact evaluation can be helpful to demonstrate the effectiveness of programs to policy makers.

2.1.3 Improved triggers to finance social protection interventions and flexible financing

Regardless of the approach taken to deploy assistance to victims, all SP interventions need to have an adequate budget. And indeed when a disaster occurs, a key concern for the affected country is how to rapidly fund the disaster assistance. Funds are needed immediately and, apart from generous international relief aid, funds are typically diverted from long-term development. When the humanitarian assistance phase is completed, the affected country has difficulty accessing funds for recovery interventions before longer-term reconstruction and development programs can commence. Timely provision of recovery financing that is able to bridge the gap between humanitarian relief and development is therefore crucial to ensure accelerated recovery and also to help focus government attention on the development issues of disasters (IEG/World Bank, 2006).

Clear and transparent rules for accessing funds for SP interventions should be part of a social protection system conceived before disasters are manifested, so that governments can scale them up in a timely fashion. The use of observable hazard characteristics such as rainfall/temperature, wind speed, earthquake magnitude, hurricane trajectories—and not the resulting damage—to trigger food or monetary payouts, transfers or donations is a promising development to resolving some of the technical challenges involved in making targeting systems and funding mechanisms respond to natural disasters (Alderman and Haque, 2007; Hellmuth, et. al., 2009). For instance, in countries where disasters have a large effect on the budget, governments who cannot borrow large sums (or face high rates of interest if they do) could enter into parametric insurance

contracts that pay when observable triggers are hit. Insuring the source of loss (rainfall shortage or excess), not the loss itself (yield loss) makes unnecessary to carry on-site inspections or individual loss assessments. This makes deductibles and copayments less needed and insurance in general easy to administer and less expensive, as is the case for example with hurricane insurance (Skees, et. al., 2002; Hess and Syroka, 2005). Once ensured that countries receive timely and adequate financial resources based on agreed upon “triggers”, these funds can be channeled for SP functions.

Innovative Financing and Insurance Products for Social Protection

Through direct budget support (lending operations) and advisory services (technical assistance and training), the World Bank Group supports several innovative financing and insurance products and services that can also be linked to SP programs (see World Bank, 2010).

Contingent Financing. Development Policy Loan (DPL) with Catastrophe Deferred Drawdown Option (CAT DDO) to provide immediate liquidity up to USD500 million or 0.25% of GDP (whichever is less) to IBRD-member countries in the event of a natural disaster. Costa Rica, Colombia, and Guatemala have all taken CT-DDOs.

Catastrophe Insurance Pools. Caribbean Catastrophe Risk Insurance Facility (CCRIF), for example, offers parametric insurance against major hurricanes and earthquakes in 16 Caribbean countries.

Catastrophe Bonds. Cat bonds to transfer risk to investors by allowing the issuer to not repay the bond principal if a major natural disaster occurs. The World Bank Group has developed a platform for a multi-country, multi-peril cat bond that transfers diversified risk to private investors.

Weather Derivatives. This type of parametric insurance can help protect countries against the risk of adverse weather events (e.g. a severe drought), by using a weather index linking rainfall with national crop/livestock production.

In addition, at the World Bank, there is a new “Insurance for the Poor Program”, that started in 2008 and is housed in the Global Capital Market Non-Banking Unit of the Financial and Private Sector Department. The specific objectives of this new program are to reduce the vulnerability of poor households by helping them to develop sustainable livelihoods through enhanced access to insurance and related financial services (Mahul, 2010). The major areas of focus are for health insurance, life insurance, crop and livestock insurance, and natural disaster insurance.

Hazard-characteristic indices can have other uses beyond insurance. They can make funds available for disaster relief and safety net much faster, and to provide reinsurance for the private sector or government, as in the Mexican case with the Fund for Natural Disasters (FONDEN).¹¹ Calamity Funds in countries like Mexico, India, and the Philippines operate as budgetary reserves that can be accessed without restrictions when normal borrowing channels are restricted, and without disrupting other development projects. Disbursements within these contingency funds that operate on a country, regional, or global scale can be tied to triggers (Escamilla, et. al, 2009). In the case of slow-onset disasters such as droughts, if the food or cash appeal is triggered by the source of loss (rainfall shortfalls), the food or monetary donations can become available and be distributed to affected districts well before the loss actually manifests (food shortage). And finally the other advantage of using rainfall data to trigger relief is that allocations, at least in the first stage, are based on geographic targeting, and this is suitable for covariate shocks whereby many households and communities are impacted simultaneously by a hazard event (De la Fuente, 2010).

There are interesting innovations that combine insurance and safety net or social insurance approaches, with ongoing programs or pilots in Mexico, Ethiopia, Mongolia, Andhra Pradesh and elsewhere that include weather indices as triggers for payouts to farmers or other population groups and to mobilize safety net transfers (Hellmuth, et. al., 2009). Ethiopia's Productive Safety Nets Program is perhaps the best example of this approach. The program offers a combination of cash transfers and public workfare to around 6 million chronically food insecure people. The aims of the program are to reduce household vulnerability, improve household and community resilience to shocks, and break the country's dependence on food aid. The program has developed a mechanism based on rainfall indices for temporary expansion into drought affected areas threatened with food shortages.

Even though weather-based indices are finding growing use in developing countries, they are far from a panacea (Alderman and Haque, 2007): Index insurance still presents technical challenges (for example, data availability) and weakens the correlation between losses and payouts. This is known as 'basis risk'—an insured party may suffer a loss yet not receive a payout.¹² Also it may not be easily affordable or in high demand in many low-income countries which lack insurance markets. Preventing losses is sometimes more cost effective than loss-based insurance. Some developing countries may choose not to take out insurance if indemnities crowd out concessional emergency funding. Therefore, weather-based insurance cannot stand alone. Many humanitarian crises are caused by factors other than climatic variability (conflict, poor governance, lack of infrastructure, political and macro-economic crises). Safety net and emergency response policies thus should not be tied exclusively to index instruments.

¹¹ See <http://www.cenavece.salud.gob.mx/emergencias/interior/sub1-2-fonden.htm>.

¹² One way to deal with "basis risk" for individual farmers/households is to have banks or local governments insure large areas of production and to distribute insurance payments, when they are received based on the trigger.

2.2 Mainstreaming disaster risk reduction into social protection policies

Designing interventions before disasters remains a key aspect of having effective emergency responses. However, acting only after disasters occur will continuously test emergency safety nets, which even if well-targeted may not always reach those affected rapidly enough to protect long-earned welfare gains, and so the transitory impacts of a hazard, particularly on children, can become permanent. Therefore emergency responses should be promoted *in tandem* and not as a substitute for policies that reduce disaster risk.

In fact, policies that address the underlying causes of household's vulnerability to natural disasters could be built into cash transfer schemes, public works and employment-intensive infrastructure programs, microfinance schemes and social funds. For example, conditional cash transfer schemes that protect human capital while coping with disasters might as well encourage households to diversify their livelihoods and enhance their sources of income. Public works and community-driven development (CDD) projects funded by social funds could promote the restoration of physical infrastructure (protective barriers) and environmental assets (reforestation) to reduce communities' exposure to disasters. Remittances to friends and family can also be reallocated to the community to strengthen small-scale social and economic infrastructure against disasters.

2.2.1 Social funds and community-based development (CDD) programs

Social funds are semi-autonomous institutions created to channel external support to communities. Typically, social funds are used for post-disaster interventions: they serve to channel immediate relief into affected communities, and facilitate the recovery of affected communities through reconstruction of basic infrastructure, including sanitation, education, and health facilities, as well as supporting small projects in sectors such as infrastructure, microenterprise development, microfinance, and social services, which have been identified by communities and presented to the social fund for financing. Social funds and CDDs allow poor people and communities to become actively involved in their own development (Grosh, 2008).

There is potential for social funds to become disaster prevention tools within communities (World Bank, 2009). During normal times, they could finance activities and projects on disaster prevention by scaling up their work in sectors relevant for creating resilience such as eco-system management and restoration, water supply and sanitation, community forestry, coastal zone management, and disaster risk management (much of this is already happening but not at a wide scale).

Moreover, the post-disaster period is an opportunity to promote and build awareness with regard to preventive measures against the next disaster. Therefore, social funds can embed safer community master plans (e.g., regulate zoning policies and building codes for earthquake and flood prone areas, prohibit development on a fault, or near landslide hazards) and/or support

better construction practices (disaster-proofing in the case of earthquakes), and mainstream into operations.

Through social funds, the international community could channel external finance to small-scale community-based SP and DRM projects in a large number of communities, even in countries with weak capacity. There might also be scope for community-based investments in avoided deforestation to attract new sources of carbon finance. However, external “experts” and project staff would need to accept that communities make investment decisions based on the risks and priorities perceived by the communities, which could well differ from formal climate predictions and expert judgment. This is the nature of community-led interventions and can be an advantage or a disadvantage depending on the perspective. There is also a need to watch out for elite capture and other governance issues in the way that communities manage social funds and community driven projects.

2.2.2 Conditional cash transfers (CCTs)

Having well targeted safety nets in place that could assist those pushed into poverty by disasters is important, but equally important is to build measures that reduce the vulnerability of beneficiaries to natural hazards into them (De la Fuente, 2010). This can happen in two ways. In places where cash transfers or workfare programs already exist as part of a wider SP system, if these programs are able to offer a credible ex-ante guarantee to households that, under certain specified conditions (i.e., “triggers”), they will receive benefits, this could allow households to make livelihoods decisions with higher risks and higher expected returns.

Alternatively, new features can be introduced to existing social protection programs to increase households or community resilience to shocks. For instance, livelihood cash transfers that permit families to acquire different assets can diversify risk by reducing the variability of income through asset and livelihood diversification (Siegel and Alwang, 1999). Also, providing cash wage for public works in environmental rehabilitation, reversing land degradation or building up protective barriers against flooding can reduce the base risk to which those communities are subject to. Access to assets and employment is vital for building resilience of the poor. As the productivity of many natural resource based livelihoods declines, peoples’ transition into new livelihoods, often in new sectors and in urban areas, may need temporary support. Effective livelihood support requires a multi-sector approach, and social protection can contribute through employment generation, asset transfers and asset building, livestock restocking, seed transfers, training and skills development, micro finance initiatives, and more orderly migration and access to safe and easy remittances.

Programs may also focus on building the assets of the poor through transfers given for productive purposes such as purchase of equipment or training or to finance working capital. This helps people start a small business and reduce their reliance on moneylenders. Such transfers are not directly designed for risk coping, which would still be required to expand in times of shocks. Instead, transfers would create resilience indirectly to the extent they are successful at helping

people grow and diversify their incomes and assets. Countries such as Ethiopia and Nicaragua run projects that combine cash transfers for coping purposes with livelihoods support aimed at increasing the income generating capacity of rural households exposed to climate risks. Such efforts simultaneously reduce poverty and improve resilience.

In Nicaragua, based on the positive impact of the human capital conditional cash transfer (CCT) program on poor families since 2000, the *Red de Protección Social* (RPS), the Government has designed a new cash transfer scheme called *Atención a Crisis* in six drought-prone municipalities with two main objectives: (i) to strengthen households' pre-disaster risk management strategies aimed at improving human and physical capital accumulation, and thus reducing exposure to drought; and (ii) to reduce the impact of aggregate shocks on human and physical capital investments by decreasing the need to use adverse coping mechanism. Impact assessments nine months after the start of the pilot test have shown that the new income provided has expanded non-farm activities among beneficiaries and reduced the sale of productive asset sales to address shocks (Macours, del Carpio and Vakis, 2008).¹³

2.2.3 Public work programs

Public works (or workfare) programs are safety nets that have been implemented around the world to counter the negative impacts of natural disasters and economic crisis. Typically, they provide short-term employment opportunities to unskilled workers through national or regional projects, such as road construction. One of their main goals is to provide income transfers to the poor and to smooth their consumption during the crisis. The potential to utilize public works and focus on “building back better” or repairing damaged infrastructure or community assets to avoid or reduce the risk of future disasters can be beneficial. In fact, public works can also be a way to include disaster risk reduction into the recovery phase. Instead of only restoring public social sector services, particularly in health, education, water and sanitation, public works can also concentrate in environmental rehabilitation, reversing severe land degradation or building up protective barriers.

In Latin America, workfare programs were first implemented in the 1980s as a short-term response to the economic crisis and the increase in unemployment rates that affected many countries, and often were associated with the structural reforms and stabilization measures that were common in the region in that period. The persistence of high poverty rates and the inability of governments

¹³ *Atención a Crisis* assists 3000 beneficiaries, and allocates one of three interventions through a participatory lottery: (i) a conditional cash transfer; (ii) a conditional cash transfer plus a scholarship that allowed one of the household members to participate in a vocational training course; or (iii) a conditional cash transfer plus a grant to start a small non-agricultural activity. The pilot program has an experimental evaluation design. The baseline survey was conducted in April-May 2005 (before the initiation of the program), collecting household and individual related data on approximately 4400 households in both treatment and control communities. A follow-up survey on the original households was collected in July-August 2006 (9 months after program initiation), and a third round was carried out in summer 2008 to study the medium-term impacts (Macours, del Carpio and Vakis, 2008).

to improve labor market conditions drove some countries to better focalize their efforts and to convert these programs into permanent interventions toward the long-term unemployed and vulnerable. For instance, the public works program in Argentina *Trabajar* was expanded and renamed *Jefes de Hogar* in response to the economic crisis of 2001. Similarly, the Peruvian government designed *Trabajar Urbano* to help the poorest urban workers following the economic recession of 1999-2001, and it continues today under the name *Construyendo Peru* (Ibarraran and Rosas Shady, 2009).

The available evidence indicates that while these public works programs can be successful in targeting the poor and protecting their income during shocks (Bouillon and Tejerina, 2007), there is considerable room for improvement in building good infrastructure and assets. Public works should only be appropriate or even justified when the assets built benefit the community, including the poor, and not only as employment projects. Employment generation programs such as Maharashtra's Employment Guarantee Scheme (MEGS) have shown that it is possible to transfer and stabilize incomes while building valuable community assets.

Also, as with CCTs, if workfare programs prove reliable sources of SP in the eyes of would-be victims of disasters, these could make their income and investment decisions based more on return and less on security.

2.2.4 Asset and livelihood protection

Public works programs are usually targeted to unskilled laborers. There has been increasing attention to the need for assistance to self-employed small business owners (including farmers) in terms of asset and livelihood protection (Heltberg, 2007, Heltberg and Lund 2009). Income from small businesses often supports many household members and possibly other laborers (directly and indirectly). When there is a hazard event assets can be destroyed and incomes lost. For rapid recovery, it is important to quickly get these small businesses up and running or there can be significant negative backward and forward linkages. That is, targeting assistance to non-poor households and enterprises might be an efficient and equitable means of helping poor households that are employees and/or service providers or these "better-off" households. Also, it needs to be recalled that non-poor households might suffer much higher monetized damages and losses than a poor household or enterprise lacking assets.

Another form of asset and livelihood protection is improved access to micro-finance, including micro-insurance (Hoddinott, 2009). Crop insurance and/or "term-life insurance" or "accidental injury insurance" can be linked (like in Andhra Pradesh, India) to loans or improved seed and equipment, both of which make payments based on objective measures. Micro-credit and micro-savings can also be important for DRM, and are often part of broader SP programs helping the poorest (Mahul, 2010).

Asset and livelihood protection is a good example of how integrating DRM into SP and vice versa expands the thinking about how a community or local economy really functions. There is a lot of focus on "multipliers" as part of input-output ratios and how money revolves in an economy.

The multiplier is usually applied for calculating the positive impacts of a new investment. However, the same logic needs to be used when there is a natural disaster, to better understand the potential negative multiplier, and to consider interventions that can reverse that from happening.

2.2.5 Remittances

Not all forms of SP are public, and a variety of informal private mechanisms have developed over the centuries, many that are embedded in tradition and custom. People often help their friends and neighbors who suffer a misfortune (broken leg, or the death of an ox), and distant friends and relatives send remittances to mitigate the impact of natural disasters. Such help, sometimes in kind, often in cash, could come directly or be channeled through community associations, domestic and foreign NGOs or local or national governments.

These remittances, whose magnitude and importance have increased recently in the LAC Region (Acosta, et. al., 2007), are put to different uses: studies find that a large part goes to buy consumer durables (refrigerators, radios, televisions) and to smooth consumption during crises, but also to productive investments, and much of what is invested is through building or adding masonry structures to their homes. Houses that are made sturdier could be considered a risk prevention measure, though this would depend on the type of hazard faced. Concrete houses could provide more protection against floods than mud structures, but in quake prone areas too much faith on cement structures could be more deadly (when badly-proofed) than otherwise. Remittances flow directly to the *victims* of natural disasters quickly and without red-tape, however they do not flow to all victims. Some of the poorest households inside communities may not be able to send migrants away so alternative forms of protection should be ensured for them during disasters.

Governments can also provide incentives to private remitters to leverage remittances into disaster risk reduction by topping up each remitted dollar with a percentage in domestic money (public savings) to a mix of the recipient and a common fund (e.g. for each dollar to a recipient the government tops it up with another dollar: half for the same recipient and half for a common fund), conditional on spending the money in small community projects, such as investments in basic infrastructure and services with hazard-proofing or improved natural resource management (soil, water, forests).

The “three-for-one” Mexican program for migrants encourages and taps into remittance behavior. In the Mexican state of Zacatecas, the Federal and local government match every dollar donated to local projects by remitters, such as small infrastructure projects (water treatment, schools, roads, parks, etc), which have strong externalities, benefiting also poorer non-remittance recipient households (Solimano, 2006). This program, which can be on a two-for-one or a three-for-one matching basis could be adapted for remittances to be channeled to improve community preparedness against disasters, and can be set up for “normal times” and for after disasters.

3. Toward a Working Agenda

Despite ongoing debates about the socio-economic impacts of natural disasters, it is important to proceed with the design of planned, proactive, integrative SP and DRM policies that focus on protecting and strengthening household and community assets and livelihoods. Social scientists from different disciplines are needed to help establish and pursue this agenda that includes conceptual, analytical and operational frameworks. To start, confusion over definition of key terms (e.g. risk, hazard, vulnerability, risk management, capacity) should be avoided. As presented in this paper, the SRM approach provides a consistent conceptual framework to apply widely used UNISDR definitions and ideas, and this can help make the causal relationships explicit and provide an integrated framework for considering SP and DRM interventions.

We suggest four broad areas for future studies: (1) monitoring changes in well-being outcomes and responses in the face of natural disasters with and without SP/DRM programs; (2) improved understanding of the risk-vulnerability chain and how households and communities can best increase resilience; (3) assessing policy alternatives; and (4) institutional arrangements and financing.

Monitoring Household and Community Well-Being Outcomes and Response to Natural Disasters. Meteorologists systematically monitor weather variables (defined and measured in a comparable manner) in specific locations over many years. Biologists monitor species and ecosystems. Social scientists have little or no comparable monitoring of the impact of climate and how households, communities, and institutions respond to it over time. To build that body of information, countries need long-term monitoring systems on weather and disasters and their socio-economic impacts and responses.

This data collection would combine longitudinal information on weather and natural disasters; panel surveys of household production, consumption, migration, health, and well-being; and surveys of community responses in selected locations. It would result in the collection of spatially referenced climate, community, and household data (health, assets, livelihoods, and well-being). A mix of quantitative and qualitative information should be collected at regular intervals and over a long period and organized using modern GIS and SDI that can be accessed by a wide range of researchers and practitioners. This kind of data would be an important public good and could greatly facilitate real-time monitoring of impacts and responses to natural disasters.

Understanding Poverty and Distributional Implications of Natural Disasters. There is a need to better understand the socio-economic impacts of natural disasters at household and intra-household levels. At present, most research in this topic is opportunistic (when data collection had been taking place before a disaster strikes). The longitudinal monitoring approach proposed above could help provide data and more efforts should be undertaken to carry out research and data collection in pre-designed interventions. Modeling efforts will also be required and could complement monitoring. One approach to modeling could aim to better predict poverty and vulnerability effects by combining agronomic models, climate predictions, and distributive analysis at spatial, sectoral and household levels through survey data, and for different social groups.

Assessing Alternative Policy Interventions. Social protection are interventions aimed at supporting the poorer and more vulnerable members of society by strengthening assets and livelihoods, and improving capacity for risk management. But of course, not one-size solution fits all. CCTs are more appropriate to protect children's human capital while workfare programs are more adequate for reconstruction activities and the provision of employment, and so does subsidized insurance to compensate rapidly for potential losses. Moreover, SP is recognized as one part of the toolkit to fight poverty, but far from the only one. Microfinance also delivers loans, savings, insurance, and other financial services to low-income so they can engage in productive activities, build assets, and protect themselves against risk. Better estimates of the benefits and costs of social protection interventions (*vis a vis* each other and relative to interventions in other areas) are needed to guide design and prioritization. Does it make sense to support all? Or should governments focus on providing a minimum safety net for those in greatest need of assistance while letting private market mechanisms provide insurance for those who are unlikely to receive publicly provided assistance?

Policy design, implementation, and governance issues should be studied for a broad range of adaptation options, seeking to assess the cost-effectiveness of alternative interventions and their distributional consequences. It will interesting to learn from experience as policy implementation proceeds. This research should help policymakers prioritize, sequence, and finance adaptation interventions in a variety of sectors. Policy design should also consider issues of access and voice by the poor: do they gain from new technology? from policy interventions? There is a long way to go but, eventually, research should be able to compare the effectiveness and the equity implications of different adaptation interventions.

Institutional Arrangements and Financing of SP and DRM. There is a need to explore institutional arrangements for managing and financing social protection. There are also many issues related to fair, equitable, and effective ways to share the costs of disaster risk management and climate change adaptation. Concerns with ethics, social justice, and political economy are central—who pays and who benefits from adaptation.

Also it should be noted that because safety nets (e.g., cash transfers) run the risk of creating dependency, public awareness campaigns are required that make clear up front the number of months that payments will be made. When beneficiaries know this, they can make informed resource allocation decisions. Otherwise, going month to month without clear information on the duration of payments can lead to dependency beyond the short-term and inefficient use of assets and livelihoods.

Explore the Best Institutional Arrangements to Manage Disasters. An important question is at what level—households, communities, local governments, national governments, or internationally—to focus SP interventions. The answer has important implications for who implements, finances, and benefits from adaptation interventions. Managing disaster risks has traditionally been the responsibility of households and communities, except for the largest disasters where national governments and donors have stepped in (for example, with emergency food aid). In contrast, there has been little support for managing more common climate risks. This may have to change as large covariate and repetitive climate events overwhelm many community institutions.

Furthermore, household and community adaptation is not always equitable, sustainable, or desirable—left on their own, many poor households and communities fall back on inequitable, unproductive, or asset-degrading coping strategies that are ultimately not effective.

Hence, applying the SRM lens to this question, we conclude that while most DRM/SP actions will necessarily take place at the local level, extra-community efforts are required. What we mean is that most successful DRM/SP efforts are likely to be local as communities and other sub-national actors often know what is in their best interest and respond accordingly to the localized manifestations of emerging disaster risks. However, local actors will increasingly need external support because the risks—large, covariate, and possibly with irreversible damages—can overwhelm local adaptive capacity. A key issue facing national governments and the international community is therefore to properly identify and build on the mechanisms that people use to cope with disasters, including remittances, migration, group solidarity and their own recovery efforts.

Sometimes there is clear ground for complementary public-private initiatives facilitate those actions that individuals take when confronted with disasters: activities of coordination and information on economic opportunities plus appropriate cash transfers and channeling of remittances are bound to come a long way towards personal recovery. However, problems might arise from these interactions as well. Additional evidence is still needed on the efficiency and equity of other public interventions relative to informal institutions, for instance, the extent to which government cash transfers or formal insurance (considered often superior to informal measures such as low-risk low-return strategies and potentially unreliable social connections) crowd-out local forms of support. It is also necessary to have a better understanding of the incentives and barriers faced by governments to adopt *ex ante* interventions or to signal credibly to private actors their commitment towards this strategic shift if it happens (De la Fuente, 2010).

4. Conclusions

Natural disasters in LAC and elsewhere can result in irreversible losses in household and community assets and livelihoods and thereby impede long-term development prospects (and even eliminate past advances). Countries and donor agencies should therefore do more to prepare for ongoing and future natural hazards, and to seek out interventions that lower vulnerability and increase resilience of households and communities.

The mainstreaming of SP policies into DRM policies, and vice versa, is a potential “win-win” strategy for reducing vulnerability and increasing resilience for households and communities. Examples of interventions to take forward include social funds and CDD projects support for community-based adaptation; safety nets that better respond to natural hazards; livelihoods programs; remittance-matching pools for undertaking preventive measures; and innovative finance and insurance products. The funding available for climate change adaptation (CCA) represents a unique opportunity for deploying this kind of interventions, and for incorporating DRM, SP and CCA into a holistic framework (see Heltberg, Siegel, Jorgensen, 2010).

DRM and SP policies already exist in the LAC region (see Table 2), but it is necessary to have more explicit linkages in concepts/analyses and interventions. This paper therefore developed and applied a social risk management framework to offer a unifying lens to examine the links between hazards, social protection, vulnerability and resilience. We discussed some proactive interventions and planning to lower exposure and sensitivity to hazard risks, and to improve disaster risk management in two ways: first, advancing the planning and financing prior to hazard events for fast ex post relief after the disaster; and second, and in tandem with the prior measures, embedding risk reduction measures into SP policies, both prior to and after hazards occur to help remove the underlying conditions which make households vulnerable to natural disasters.

Annex

UNISDR Definitions:¹⁴

Disaster Risk: the probability of an event with harmful consequences. The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

Natural Hazard: A natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Vulnerability: The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

$$\text{Disaster Risk} = \text{Natural Hazard} \times \text{Vulnerability} - \text{Capacity}$$

Capacity: The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.

Disaster Risk Management (DRM): The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

Disaster Risk Reduction (DRR) The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. NOTE: in the paper, when we refer to DRM, it includes the UNISDR definitions for DRM and DRR.

Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to 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.

¹⁴ See UNISDR (2009b) <http://www.unisdr.org/eng/terminology/UNISDR-Terminology-English.pdf>.

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