GUIDANCE NOTE

Making Social Protection Information Systems Adaptive

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Making Social Protection Information Systems Adaptive

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Why it Matters:

The Information Systems used by Social Protection (SP) programs are an invaluable resource for monitoring, managing, and delivering SP benefits and services to poor and vulnerable populations. These are often the public information systems that contain more detailed information on persons that interact with public agencies, including individual identification numbers, and data on household composition; demographics; education, health and socioeconomic characteristics of household members; dwelling characteristics and housing location; and data on other aspects of vulnerability such as disability, gender, employment status, etc. At the same time, pervasive disaster risk in Latin America and the Caribbean (LAC) warrant improved use of data and information to build the resilience of those most vulnerable, and for making quick decisions in post-disaster contexts, often in data-constrained environments. Given this, there is increased recognition of the utility of SP Information Systems (SPISs) to help address Disaster Risk Management (DRM) objectives. Some countries in LAC have been pioneers in piloting, using and integrating SPISs to improve delivery and coordination for regular SP benefits and services. On the other hand, there remains several countries in the region, who are still using rudimentary systems for data and information management of their SP programs and services. There is also little evidence from the region of effective data sharing and interoperability across SP and DRM information systems, compounded by weak data policies and standards in some countries. Given this, there remains significant untapped potential for more effective use of SPISs to address disaster and climate-related risks in the region. This Guidance Note summarizes how LAC countries can better use their SPISs to support Adaptive Social Protection (ASP) and DRM objectives. While the note has a focus on disasters caused by natural hazards, the framework and lessons are also applicable to other types of emergencies and shocks.

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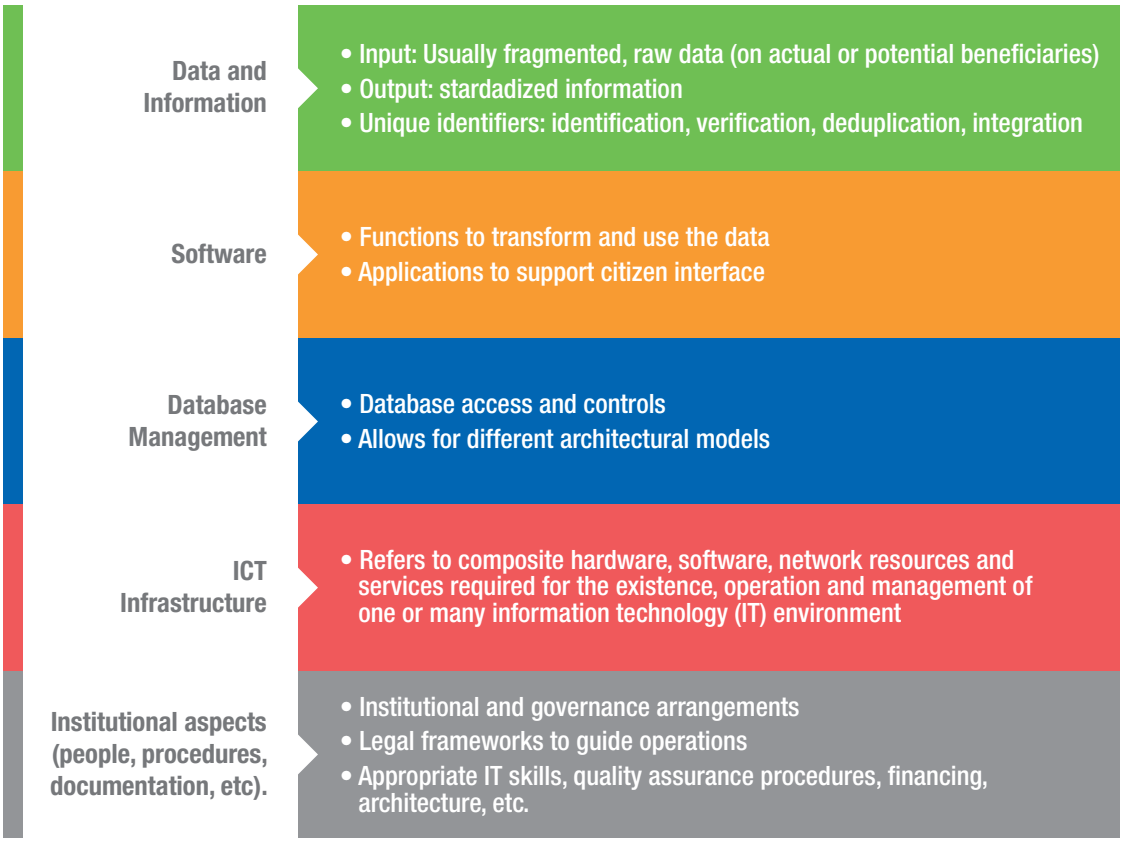
1. Key Facts: The Nuts and Bolts of Social Protection Information Systems[1]

SP Information Systems (SPISs) are software applications that manage information for SP program operations.[2] SPISs collect, organize, store, process, create and distribute information, and through these functions, are important to linking households and individuals' needs to the provision of programs and services. SPISs also support monitoring, reporting, and data analytics. Overall, SPISs aim to increase the responsiveness of SP interventions to risks, needs, vulnerabilities of applicant and beneficiary households. These systems help increase the overall accountability, efficiency, effectiveness of the SP programs that use them. SPISs are characterized by several key elements to accomplish these objectives. (Chart 1)

Chart 1: Elements of Social Protection Information Systems



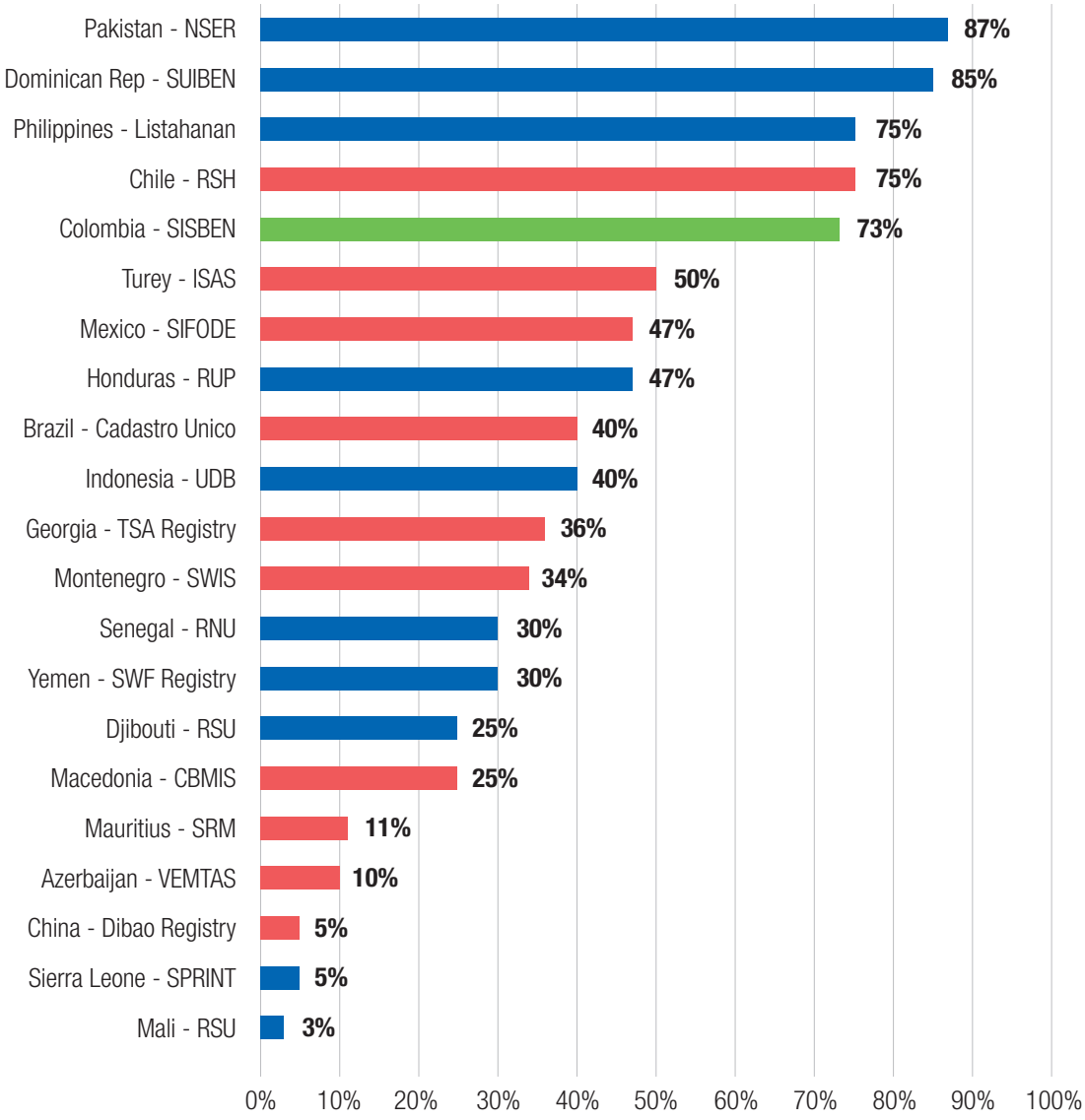
Source: Adapted from Leite et al. (2017)

The principal types of SP information systems are social registries and beneficiary registries.

- ***Social registries*** are information systems that support outreach, intake, registration, and determination of potential eligibility for one or more social programs. These systems contain information on applicants to targeted or universal programs and therefore provide a "gateway" for potential inclusion of intended populations into social programs. Some important distinguishing features of social registries are that they contain information on all registrants (applicants) and

are usually a component of a broader information system. Social registries are distinct from civil or population registries and often contain much more detailed socioeconomic, household and demographic data than civil registry systems. Nevertheless, social registries may be linked to civil registry systems for cross-checks and verification purposes. In terms of program delivery, social registries mainly support the delivery processes related to outreach, intake, registration and eligibility determination for programs. When used for multiple programs, social registries help link intended populations to a range of benefits and services that may otherwise imply significant burden on the beneficiary during multiple application processes to provide the same information to several different programs. Integrated social registries also improve coordination across different programs and have not only been used to assess potential beneficiaries for SP benefits and services, but in some countries are also used to determine eligibility for housing benefits, emergency assistance, energy subsidies and health and education benefits etc.

Chart 2: Social Registry Coverage Across Select Countries



Source: Leite et al, 2017. (World Bank); Administrative Data for Honduras (2019)

The chart demonstrates coverage as the percentage of the population included in the social registry (circa 2015-2018). Countries in red are primarily on-demand systems for intake, while those in blue carry out en-masse registration through census or survey sweeps. Colombia (in green) uses a combined approach.

How social registries are populated are also of vital importance. Some registries are populated on an on-demand or dynamic basis, where persons or households seeking benefits or services that use the social registry for intake need to present themselves to apply and do not have restrictions on when they could apply for inclusion in the registry. In other contexts, registries could be populated through a static census approach, usually through survey-sweep of pre-identified geographic areas (often those with high concentration of the poor) at set periodic intervals, (e.g. every 4-5 years). In such cases, registration and updates are closed during the interim years. In these contexts, the census approach generates a fixed list of potential beneficiaries that is often only updated in subsequent census rounds of registry intake. There are trade-offs to the intake-process used for social registries. Social registries that utilize census approaches often demonstrate higher coverage, but are costly and updated infrequently. These registry types are largely developed initially with this model to fill data gaps where programs may be new and coverage small. Given this, they are useful to providing a gateway to poor and vulnerable, many of whom may have been excluded or lacked access to benefits and services. On the other hand, social registries that use dynamic and/or on-demand approaches for intake are less costly, but generally demonstrate lower coverage (Chart 2). The development of Social Registries often entails lengthy processes to establish buy-in across a range of relevant actors; establish institutional arrangements and management and decide on an optimal design to meet the registry's objectives. The typology and trajectory of Social Registries vary, and it is important to acknowledge there is no single model that would fit every country's context, capacities, and needs.[3]

- ***Beneficiary registries*** are information systems that support the management of specific programs. These registries only contain information on those enrolled in specific programs, including the beneficiary's data (identification, age, gender, address, household information, payment details, etc.), type of benefit, the amount of the benefit, payment frequency, duration of enrollment in the program, and other pertinent information. Beneficiary registries support the processes of enrollment and onboarding; provision of benefits and services; grievance redress; and other related monitoring and management functions for the program(s) they are used by. As such, these systems are critical to ensuring that benefits and services are delivered effectively and for assessing service delivery and performance outcomes of programs on the persons they serve. Similar to social registries, these systems are often developed within a broader information system. When integrated and used for multiple programs, these registries help programs and implementers better track the supply/provision of benefits. This is useful to not only identify where there may be duplication of benefits, but more importantly, help implementers better assess gaps where households and individuals are perhaps not receiving benefits and services that are needed to address their poverty and vulnerability.

- ***Integrated Social Protection Information Systems:*** Increasingly, social and beneficiary registries do not operate in isolation, but tend to be components of a broader integrated information system. Integrated SPISs facilitate multiple information management functions for a single or range of programs and services. These integrated systems often include social registries, beneficiary registries, payment systems, case management and grievance redress systems, and protocols and frameworks for interoperability and data exchange. These systems also work optimally when there is a unique identifier to establish and confirm identity, particularly given information sharing and cross-checks across multiple modules and complementary systems.

Chile's Integrated Social Information System is a notable example of an integrated SPIS in LAC and globally. The system includes an Integrated Social Registry (Registro Social de Hogares - RSH); an Integrated Beneficiary Registry (Registro Integrado de Beneficiarios - RIB); an integrated inventory of social programs (BIPS); and a territorial information system to geo-reference individuals and households in the RSH and RIB, and programs in the BIPS.

Source: Leite et al, 2017

2. Design Features and Principles for Sound Social Protection Information Systems

Reviews and assessments of the importance of SPISs globally and in the LAC region over the years have been extensive.[4] A literature review of these reports and assessments have helped identify key variables for ensuring that SPISs have sound design. These principles are also applicable to other types of information systems and include:

- **Good Quality Data:** ensuring that data stored in SPISs are of good quality is critical. Key metrics for assessing SPIS data quality includes ***relevance, accuracy, currency,*** and ***completeness of data***, and the ***coverage*** of the system. For sound data quality, SPISs should include clear mechanisms to establish identity; ensure that the data in the system is relevant to the decisions to be made; use accurate data capture processes; ensure data included is complete; use careful data entry; establish data verification and validation processes and protocols; and have routine mechanisms for data updates to ensure currency of data. Good quality data is optimally supported by unique identification systems to verify identity.

- **Clear and user-friendly system structure:** this includes ensuring good organization of the data stored in these systems and development of distinct modules aligned to different program processes. Ensuring good accessibility for users and for persons whose data is stored in these systems.

E-Governance in LAC:

The United Nations E-Government Development Index (EGDI) provides an indicative assessment of countries' use of information and communications technology to deliver public services. The Index comprises metrics on the scope and quality of online services, status of telecommunication infrastructure and existing human resource capacity. In 2018, Uruguay was the only LAC country with a Very High EGDI; while 22 LAC countries were classified as High EGDI, including Argentina, Barbados, Brazil, the Dominican Republic, Chile, Colombia, Mexico, and Peru, among others. Ten LAC countries were classified as Middle EGDI, including Belize, Jamaica, Nicaragua and Suriname, among others. No LAC countries were classified as Low on the Index.

Source: United Nations E-Government Survey 2018

- **Mechanisms for interoperability and/or interface with complementary information systems:** to facilitate improvements in updating, validating and verifying data, as well as other efficiency gains. For example, interoperability could help reduce the amount of duplicate data simultaneously stored in SPISs and other public information systems; facilitate cross-checks across other systems (for instance tax, national identification, and social security systems); and improve bi-directional data sharing with complementary information systems for improved coordination. This applies even to SPISs that are intended to support information management for a single program. Where there are mechanisms to facilitate interface, interoperability and/or bi-directional data sharing, the utility of an SPIS for supporting effective program management, monitoring and delivery improves.

- **Security and access protocols:** SPISs contain sensitive and private information on household demographics; earnings, expenditure; health and education status etc. Ensuring security of the data in these systems is essential, including determining the level of access for different user types. Security should prevent against system breaches as well as protect the system's hardware and data in times of disasters and other emergencies. System audits also help improve the security of the SPIS. Clear policies for access to information also support transparency in data access.

- **Legislation and Policies:** these systems are optimally supported by legislation and policies that govern their use and ensuring their adherence to international norms and standards.

The State of Cybersecurity in LAC:

The International Telecommunication Union's (ITU) Global Cybersecurity Index ranks country commitment to cybersecurity across a range of metrics, including legal, technical, organizational, capacity building and cooperation. Uruguay was the only LAC country to score high on the index in 2018. Thirteen LAC countries obtained a medium score on the index in 2018, with Cuba, the Dominican Republic and Jamaica being the only Caribbean countries in this group. Nineteen LAC countries obtained a low score– primarily Caribbean countries.

Source: ITU Global Cybersecurity Index, 2018

3. The Use of Social Protection Information Systems in Latin America and the Caribbean

Over the last two decades, LAC countries have invested heavily in different types of information systems to better manage information for SP program and service delivery and to ensure effective distribution of resources to the right people at the right time. As a result, most countries in LAC count on information systems to support the delivery of their SP programs, but similarly to other aspects of SP delivery, there is variation in the use and sophistication of SPISs across countries. A previous 2015 review[5] of 25 LAC countries found that 17 countries in the region had either a single program or multiple program social registry, while at the time, two countries were in the process of implementing a social registry, and three countries did not have any in place. This review also found that 18 of the 25 countries had some type of beneficiary registry (either integrated or for a single program). Table 1 below provides an update on the presence of social and beneficiary registries and integrated SPISs in select LAC countries.

Many of the countries with first generation cash transfer programs and well-established social insurance schemes have established registry systems both for intake and beneficiary monitoring, often for multiple programs. As Table 1 illustrates, most LAC countries use their social registries to identify potential beneficiaries for multiple SP benefits and services. An exception to this is the Caribbean region, where most social registries are currently used for a single program, often the flagship cash transfer program. Despite this, there are plans in place to upgrade and/or develop multi-program social registry information systems in several countries, including Belize, St Lucia and St Vincent and the Grenadines. Where they exist in LAC, multi-program social registries are used to determine eligibility for multiple benefits and services. Most countries, including Brazil, Colombia, Chile, the Dominican Republic (DR), Honduras, and others use their registries to determine eligibility for a range of SP benefits and services. For instance, Belize's the Single Information System for

Beneficiaries determines eligibility for the BOOST Conditional Cash Transfer (CCT), Food Pantry Program and the Ministry of Education's Secondary School Subsidy, while the DR uses the SIUBEN registry to determine eligibility for nine benefits. Brazil and Colombia's registry are used to determine eligibility for over 30 and 21 benefits respectively. On the other end of the spectrum, Chile's social registry (Registro Social de Hogares - RSH) determines eligibility for over 80 different benefits and services, including cash and in-kind transfers, social pensions, social services, labor and employment benefits, emergency benefits, energy subsidies, housing subsidies, education and health benefits etc. For beneficiary registries, there is generally an even distribution of countries that have integrated or multiple-program beneficiary registries, while others operate beneficiary registries on a program-by-program basis. In cases where beneficiary registries are single-program and not integrated, they do not facilitate a comprehensive or overarching view of the benefits and services being provided to the individual or household.

Table 1: Use of Social Protection Information Systems in Select LAC Countries

Country	Social Registry		Beneficiary Registry		Integrated SP Information System
	Single-Program	Multiple-Program	Single Program	Multiple Program	
Argentina		✓		✓	
Belize*		✓		✓	
Brazil		✓	✓		
Chile		✓		✓	✓
Colombia		✓		✓	
Dominica	✓		✓		
Dominican Republic*		✓		✓	
Ecuador		✓		✓	
Grenada	✓		✓		
Haiti*		✓	✓		
Honduras		✓	✓		
Jamaica*	✓		✓		
Mexico		✓		✓	
Panama		✓		✓	
Peru		✓		✓	
St Lucia*	✓		✓		
St Vincent and the Grenadines				✓	

Sources: From program administrative data; World Bank staff.
For the Dominican Republic, SIUBEN collects partial information on the individuals that receive some sort of benefit (but not on the benefits themselves); For Haiti, beneficiary registries are donor-managed program registries; Belize, Jamaica, St Lucia and St Vincent and the Grenadines are all currently planning reforms to move towards more integrated and multi-program registries. Belize, Jamaica and St Lucia also plan to develop integrated SP information systems.

4. Assessing SP Information Maturity in Latin America and the Caribbean

The design and implementation of SPISs in LAC has evolved in complexity over time driven primarily by each country's context; starting point and objectives for the SPIS; budget and institutional capacity. Among LAC countries, the implementation and evolution of such systems vary greatly. From using locally managed excel tables to managing beneficiary information for single programs to completely integrated information systems, centrally managed, covering a significant share of the country's population and integrated across a range of programs. Some countries in the region have made considerable investments in the design and development of these systems over time, while others have struggled with securing resources to ensure effective system performance. Several variables can help LAC countries self-assess the maturity of their SPISs. These are summarized in the table below and illustrated in Chart 3.

Table 2: Typology for Assessing the Maturity of Social Protection Information Systems

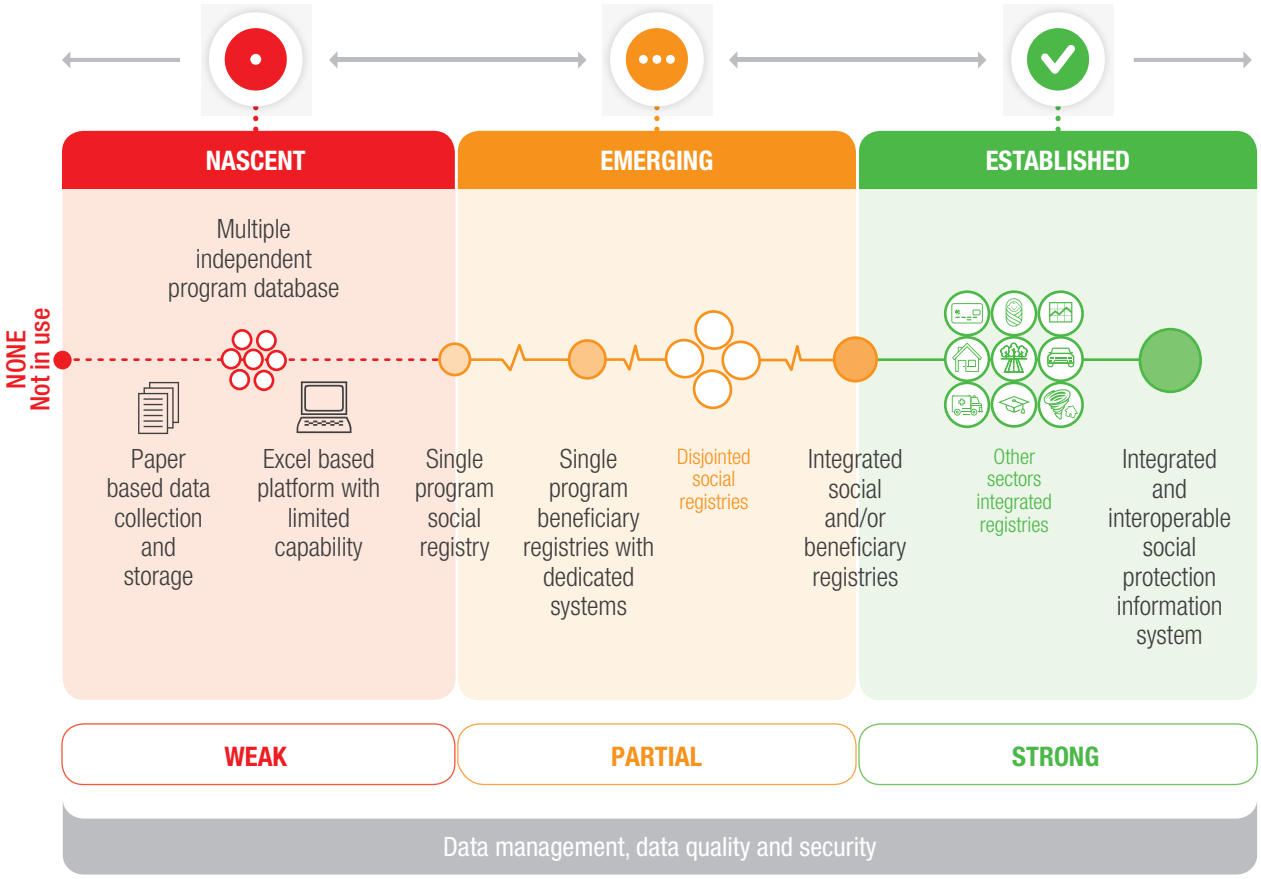
SYSTEM FEATURE	NASCENT	EMERGING	ESTABLISHED
Data management	Largely paper-based	Electronic for flagship programs, but not complete for smaller SP programs	Data management for all programs is digitized and electronic
Data Quality	Data suffers from major quality issues, including being outdated and not collected regularly; limited relevance of data to inform all decisions; issues with completeness and accuracy; and lack of validation and verification protocols; unique ID systems are absent	There is general confidence in data quality, but there may be gaps related to key data quality features, such as a lack of verification protocols or infrequent data update. Unique ID systems may be absent or just being piloted.	High confidence among users and the public of the quality of data stored in the system. Clear verification protocols in place and data update is routine. Unique ID systems and other complementary systems to verify data also help improve the confidence in data quality.
Interoperability, Integration, and Data Sharing	Where they exist, systems operate in isolation and are not linked to complementary systems	Data sharing and integration is limited; complementary systems may exist, but bi-directional data sharing may not yet be in place	The main SPISs are fully interoperable with complementary systems, bidirectional data sharing and integration across multiple programs
Security	Where they exist, systems do not have appropriate security mechanisms in place for hardware and software. Few controls are in place for regulating user access.	Some security measures may be in place for main SPISs, e.g. cloud back-up, but security may not be well-established through regulated user access, clear emergency protocols etc.	Strong security mechanisms in place for data, software and hardware, including well-regulated user access, cloud back-up, emergency protocols, etc.

Continued

SYSTEM FEATURE	NASCENT	EMERGING	ESTABLISHED
Legislation and Policy	No legislation or policy in place to govern the use of SPISs and their data	No binding laws to govern the use of SPISs and their data, but MOUs, manuals, codes of conduct and other non-binding guidelines may be established	There is clear legislation or policy in place to govern the use of SPISs and their data
Social Registry	Non-existent	Single-program or for a few programs with small coverage	Developed for multiple programs with broad coverage and processes for routine data updates
Beneficiary Registry	Simple excel based platform or paper-based for each program	Major SP programs have established beneficiary registries that operate as standalone SPISs	Integrated or interoperable beneficiary registries with bidirectional data sharing

Source: Authors

Chart 3: Typology for Assessing SPIS Maturity in LAC



Source: Authors

It's important to note that development may not be entirely linear. Countries could advance development on one spectrum, yet demonstrate less maturity on another. Countries could also leapfrog to more integrated and interoperable systems.

5. Disaster Risk Information Systems (DRIS)

There are also a range of information systems that support Disaster Risk Management (DRM). Three critical DRM-related information systems which are useful to the discussion in Adaptive SPISs are discussed here.

- ***Geographic Information Systems (GIS)*** are "any system that integrates, captures, stores, analyzes shares, manages, and displays data that is linked to location or geographic data."[6] These systems use computer database technology to merge geo-referenced and cartographic information to create digital maps and databases. Similarly to other information systems, GIS are comprised of hardware, software, data and require appropriate human resource and capacity for their effective management. GIS tools are quite important to addressing DRM objectives. These include facilitating analysis and modeling of risks in specific geographic areas. GIS technology can help countries review the location and impact of previous disasters and improve predictability of where disasters are likely to occur.[7] The data from GIS systems are therefore critically important for the DRM pillars of risk identification, risk reduction, preparedness and effective response. Particularly, the visualization and data consolidation capabilities of GIS enables these systems to convey large amounts of information to a large number of people in a brief period of time.[8] GIS tools are quite important for the production of hazard and risk maps, both of which are essential to risk identification, risk reduction, preparedness and response actions. Hazard maps on one hand usually depict the areas which could be exposed to specific hazard types while risk maps combine information on hazards and various metrics of vulnerability for a combined mapping of exposure and vulnerability. These maps are critical for helping decision makers identify required measures to minimize risks and to improve disaster preparedness.[9]

- ***Early Warning Systems (EWS)***[10] are "integrated systems of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events."[11] The United Nations Office for Disaster Risk Reduction (UNDRR) identifies four key elements for effective EWS and notes that failure in one of these elements could jeopardize the performance of the whole system. These include (1) disaster risk knowledge based on

Chile's Early Warning System

Chile has a National Early Warning Center (*Centro Nacional de Alerta Temprana* – CAT – in Spanish) which operates 24 hours daily to continuously monitor the country for emergencies. The system relies on information provided by scientific agencies such as the National Seismological Center; the Navy Hydrographic and Oceanographic Service; and National Service of Geology and Mining; as well as technical bodies under National Civil Protection System. Regional monitoring centers are present in all 15 regions of the country, allowing updated, integrated and adequate flow of information (also including basic services and infrastructure conditions). In the event of a threat, the system is activated immediately, and so security procedures take place (tsunami alert, evacuation, etc.).

Constant monitoring provided by CAT enables the emergency declaration that triggers disaster response (pre-disaster in the case of weather-related events and post-disaster in the case of earthquakes); as well as post-disaster updates including evacuation and tsunami alerts etc.).

The country also has a National Tsunami Warning System and participates in the International Tsunami Warning System, which operates from the Pacific Tsunami Warning Center located in Hawaii in the United States.

Chile's emergency alert system is also regulated by legislation which prioritizes alerts from the Emergency Alert System and governs the technical requirements for alert transmissions.

Sources: OPM (2018); EENA (2018)

the systematic collection of data and disaster risk assessments; (2) detection, monitoring, analysis and forecasting of the hazards and possible consequences; (3) dissemination and communication, by an official source, of authoritative, timely, accurate and actionable warnings and associated information on likelihood and impact; and (4) preparedness at all levels to respond to the warnings received. EWSs are primarily focused on natural hazards and could address a single hazard type, or multiple hazard types. Multi-hazard EWSs help address varied hazards and/or impacts and can also consider the potential interrelated effects. As such, a multi-hazard EWS with the ability to warn of one or more hazards can increase the efficiency and consistency of warnings and facilitate monitoring for multiple hazards.

- ***Registries of Disaster Affected Households (RDAHs):*** Some countries also collect data on household impacts and needs after disaster events through post-disaster household assessments (PDHAs).[12] The data from these assessments may be stored in information systems to inform a range of disaster response actions. These systems store data, often providing a static picture of household needs and impacts at the time of the shock or shortly thereafter. In some LAC countries, these systems are called Victim Registries or *'Registros de Damnificados'* in Spanish. The institutional arrangements for managing PDHAs and consequently the information collected during this process varies widely across countries. In some countries, this data is managed by Civil Protection agencies (for example in Colombia),[13] while in others it is managed by Ministry or Agency responsible for Social Protection (e.g. in Chile). In some cases the process is largely multi-sectoral, but with clearly assigned leadership. Such is the case in Jamaica where a multi-sector Humanitarian Assistance Committee chaired by the Ministry of Labour and Social Security (MLSS) is responsible for the instrument and data collection is carried out by multi-sector teams led by social workers. Although SP ministries and agencies play a major role in some PDHA processes, the RDAHs associated with these instruments are noted here as DRISs given that their primary objective is to assess post-disaster impacts and needs. It is important to note that not all LAC countries that have PDHAs store the data collected from this process in information systems. Some countries use simple excel based platforms to store this data, while others still rely on paper-based processes.

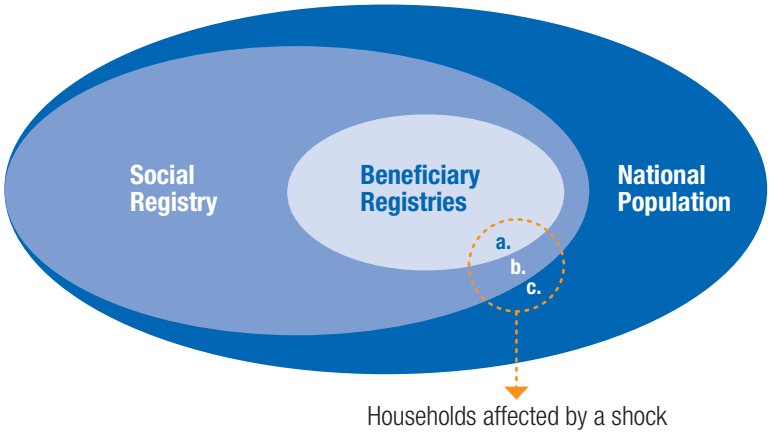
Colombia's Single Victims Register (*Registro Único de Damnificados - RUD*) is managed by the National Unit for DRM. The RUD contains information on household members; dwelling location and characteristics; affected property, crops and livestock lost; support received etc. Each household is given a system-generated unique identifier. The system is a web-based platform available for use by various sector stakeholders.

Source: UNGRD, Colombia

6. The Relevance of Social Protection Information Systems to Disaster Risks

Social Protection decisions to address disaster risk often require identifying geographic locations, households and individuals exposed to different hazard types; identifying the factors that increase vulnerability, including poverty status, housing conditions, livelihoods etc.; determining appropriate preparedness actions to minimize disaster impacts; assessing the potential impacts of disasters and their potential costs; establishing mechanisms to quickly assess the impacts of disasters and estimate response and recovery needs and costs; establishing appropriate mechanisms to address hazard exposure and vulnerability; and developing measures to improve adaptation and boosting resilience to future shocks.

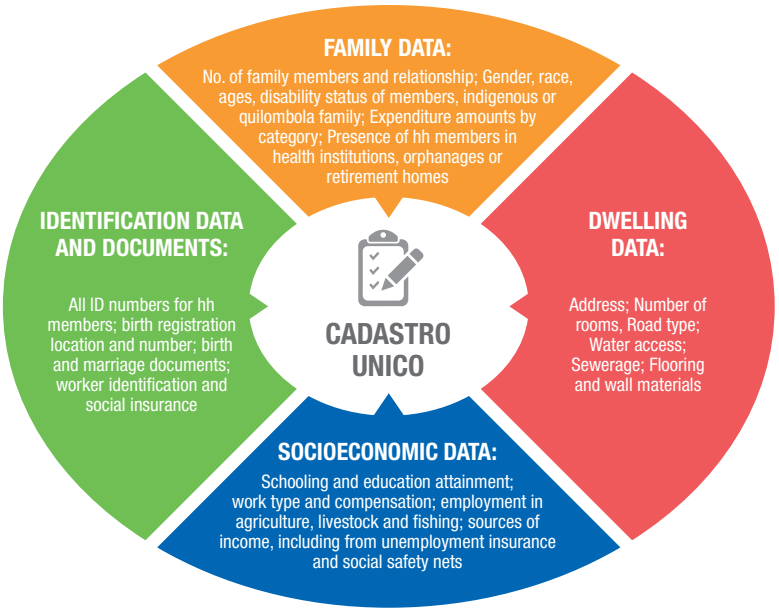
Chart 4: Possible Shock-Affected Populations Across SP Information Systems



Source: Adapted from R. Beazley. OPM, 2019

The information needed for effective Adaptive Social Protection (ASP) must help inform resilience building and improve capacity to prepare for, cope with and adapt to covariate shocks. Prior to a disaster, it is critical for SPISs to help identify risks among households and individuals; help inform measures to reduce household risk based on the vulnerabilities identified in these systems; support actions to improve preparedness of SP systems and beneficiaries; and help inform possible financing for effective post-disaster SP benefits and services. When disasters strike, and depending on their scale, they affect large segments of a country's population. Data on affected persons may be stored in a range of public and SP information systems, and can help support response and recovery efforts, primarily through the provision of post-disaster SP benefits and services to those whose data are in those systems. Additionally, segments of the population may also be in need of post-disaster SP benefits and services, but their data may not be in SPISs (Chart 4). SP systems therefore need established mechanisms to collect data on these affected populations so they can be provided with adequate and timely support to help with their recovery.

Chart 5: Example of Social Registry Data – Brazil's Cadastro Unico



Source: Author's illustration based on the Cadastro Unico Intake Instrument

SPISs often contain a wealth of demographic, dwelling and socioeconomic information relevant for addressing disaster risks, and often, for a large number of individuals and households than other information systems. As Chart 2 illustrated previously, some countries in LAC demonstrate high coverage of these systems including over 70 percent of the population for Chile, Colombia and the Dominican Republic. Coverage also exceeds 40 percent of the population for Brazil, the Dominican Republic and Mexico.[14] Evidence from recent disaster events have found that large shares of disaster affected households had data in social registries in LAC countries, including 66 percent of the households affected by the 2016 earthquake Ecuador; 80 percent of households affected by the 2017 floods in Peru; and more than 90 percent of households affected by recent shocks in Chile.[15] These systems include very useful information on household composition; demographics; education; health; consumption, expenditure and/or income and other socioeconomic characteristics of household members; dwelling and housing location and characteristics; and data on other aspects of vulnerability such as disability, gender, employment status etc. An example of data from one of the region's more well-known social registry, Brazil's Cadastro Unico, is detailed in Chart 5. Each SP information system may therefore have a specific purpose to inform different ASP decisions. The Table below summarizes the utility of the main types of SPISs for informing common ASP decisions. As the table illustrates, each system type is incapable of informing every decision, but could be useful, depending on the desired action to be taken.

Table 3: Applicability of SP Information Systems by ASP Action

ASP Action	Beneficiary registry	Integrated beneficiary registry	Social registry	Integrated social registry
Capable of providing information on vulnerability for **preparedness and risk reduction actions**	YES	YES	YES	YES
Design **tweaks** – using data to inform tweaks in program design for shock response	YES	YES	YES	YES
Piggybacking – Use of an existing SPIS infrastructure by an external agency to deliver post-disaster benefits	YES	YES	YES	YES
Vertical expansion – rapid increase of benefits to existing beneficiaries after a shock	YES	YES	NO	NO
Horizontal expansion - provide information of non-beneficiaries of social programs	NO	NO	YES	YES

Source: Authors

The Benefits of Cross-Referencing SPIS and DRIS Data

On their own, both SPISs and DRISs contain valuable data for address SP and DRM objectives and to inform their respective interventions. However, in isolation, they offer limited utility for effectively addressing the disaster risks faced by individuals

and households. Interoperability between SPISs, including social registries, with different DRISs and tools including hazard maps, EWSs, and registries of disaster affected households, could facilitate better informed decision making, both ex-ante and ex-post, such as improved risk mapping and profiling. The potential utility for cross referencing different SPISs with different DRISs are visualized in the table below. In addition to this, interoperability of SPISs with DRISs should take into account any previously established frameworks for data sharing.[16]

Table 4: Utility of Interoperable SP and DR Information Systems

		SPIS	
		Social Registry (SR)	**Beneficiary Registry (BR)**
DRIS	**Geographic Information Systems (GIS)**	• Cross-referencing GIS data and hazard maps with social registry (SR) data to improve risk mapping, risk identification, vulnerability assessment and risk communication.	• Cross-referencing hazard maps with beneficiary registry (BR) data to improve understanding of risk, multi-variate vulnerability assessment, and risk communication to SP beneficiaries
	Early Warning Systems (EWS)	• Use of EWS to trigger processes for horizontal expansion of post-disaster SP benefits	• Use of EWS to trigger vertical expansion of post-disaster SP benefits to beneficiaries
	Registries of Disaster Affected Households (RDAH)	• Interoperability and bi-directional data sharing across RDAHs and SRs to complement or verify data collected in post-disaster contexts to inform more appropriate post-disaster SP response	• Interoperability and bi-directional data sharing across RDAHs and BRs to complement or verify data collected in post-disaster contexts and to update on the receipt of post-disaster benefits and services

Source: Authors. SPISs referenced here can be single-program or integrated, though their potential improves once integrated. Ensuring the soundness of these systems is also crucial.

Constraints to Using SPIS Data to Inform DRM Objectives

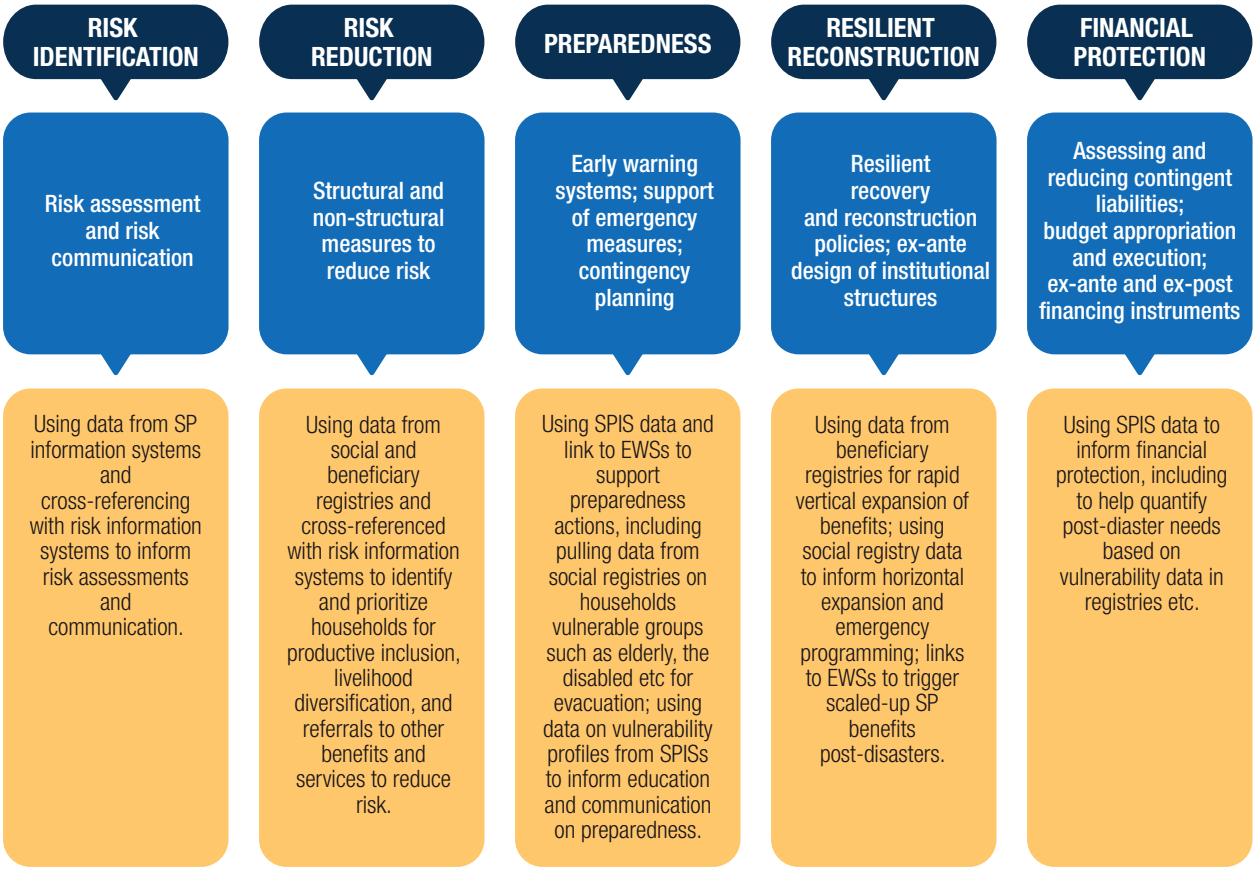
It is important to note that there are several constraints to effectively using SPISs to address DRM objectives, and their effective use in LAC countries and elsewhere has not been fully realized.[17] As Chart 4 illustrated, while these systems may have a wealth of data for those whose information is stored in these systems, there remains large segments of the population who are not captured by these systems. For example , in Ecuador, only 15 percent of households within the Registro de Damnificados' after the 2016 earthquake were recipients of the country's flagship cash transfer program (*Bono de Desarrollo Humano*),[18] and consequently, the program's beneficiary registry. The ability of the SPIS to inform DRM objectives primarily depends on soundness of these instruments, including their data management mechanisms; data quality, including relevance, completeness, and currency; accessibility; security; and legal frameworks. Also important is whether protocols to facilitate their use for DRM objectives are in place and clear institutional and administrative arrangements for data-sharing and use across a range of agencies that may use this data.

7. Recommendations and Design Options for Making Social Protection Information Systems More Adaptive to Disaster Risks in LAC

SPISs are importantly relevant to addressing DRM objectives. Each SPIS type on its own can help improve decisions and actions for risk identification, preparedness, risk reduction, response and financial protection. Additionally, when data from these systems are cross-referenced, or interoperable with data from DRISs, the utility of these systems for improving resilience, coping and adaptation among poor and vulnerable households increases. A summary view of how these systems can be applied to address different DRM objectives are outlined in the chart below. Despite this utility, the use of different SPISs to inform DRM objectives and interoperability across SPISs and DRISs has been limited. These systems require sound design and clear protocols and arrangements if used for DRM objectives.

This note has outlined the importance of SPISs for improving delivery of SP benefits and services and provided a summary of their use in LAC countries. The region benefits from beneficiary and social registries, with some countries having multi-program and integrated SPISs at their disposal to support the delivery of benefits and services. Nevertheless there remain gaps to the effective use of these systems for both regular SP delivery and to support ASP. The principles of sound data management, data quality, accessibility, security, legal framework etc. are all critically important to ensure sound functioning of these systems and their use to help address disaster risks. The following are recommended design options to improve the relevance and utility of SPISs to support DRM pillars.

Chart 6: Applying SP Information Systems to Disaster Risk Management Pillars



Author's adaptation based on The Sendai Report, GFDRR (2012)

1. **Ensure sound data management and system design of SPISs ex-ante:** In the few cases where LAC countries are still relying on paper-based processes or simple excel databases to manage data for intake and beneficiary monitoring, they should transition to established SPISs to support these functions. Establishing new SPISs should take into account cost and sustainability, for example, ensuring minimal recurring software license costs. Additionally, all countries in LAC should review their SPISs to ensure that the supporting IT infrastructure, and system design are of sound quality ex-ante. This includes ensuring:
   - Appropriate hardware infrastructure, software and networks to effectively and securely support system functions.
   - Clear protocols for data management processes and roles
   - Ensuring user-friendly system design and structure to support different user modalities
   - Strong measures to ensure system security and security of the data stored therein.

2. **Improve data quality of SPISs to inform regular delivery and ASP-related actions:** This note, and numerous global assessments of SPISs, have established the importance of the quality of the data included in these systems. Principles for data quality include ensuring ***relevance, accuracy, currency, and completeness of data,*** and the ***coverage*** of the SPIS to intended populations. For LAC countries, challenges with data quality include limited coverage of social registries for some countries; outdated data for social registries with static intake; low coverage of flagship safety nets, translating to limited coverage of beneficiary registries; a lack of interoperability and bidirectional data sharing; limiting coordinated delivery; and limited mechanisms in place to ensure data accuracy etc. These issues all limit the potential for using SPISs in LAC to support DRM objectives. As such, it would be important to assess and address the gaps that hinder the quality of data in SPISs. Improving data quality will not only be essential for regular SP delivery but will also improve the utility of SPISs for supporting resilience and response actions.

3. **Improve interoperability and data sharing between SPISs and DRISs:** Addressing issues related to risk and vulnerability is by nature, multisectoral. It therefore requires coordinated response across a range of actors. Improving ASP in countries also requires moving away from addressing challenges related to chronic poverty, but also addressing transient poverty resulting from shocks, and using SP benefits and services to help address vulnerability to hazards and climate change. Effective ASP therefore requires strong coordination across both SP and DRM actors, and the information systems managed in both fields, are useful resources for improving such coordination. This note therefore recommends that LAC countries facilitate interoperability and bi-directional data sharing across SP and DR information systems. Some principles include:
   - Where absent, establish common identifiers to support interoperability and cross-checks across systems
   - Assure confidentiality of data
   - Define protocols and/or legal frameworks for data sharing, access, and use by different actors
   - Define inter-institutional arrangements for governance and management of systems and their integrated use
   - Ensure effective communication to users of the systems and to those whose data is stored in these systems.

4. **Establish emergency protocols to protect against data losses and interruptions in service delivery:** It is important to ensure that sound emergency protocols are in place to protect against data loss and service interruptions of SPISs, and other information systems. Though linked to the prior recommendation on system design, it is important to highlight this issue as a separate recommendation as recent disaster events have highlighted the consequences of this issue. For instance, Hurricane Maria in Dominica crippled electricity and telecommunications networks and also resulted in physical damage to Government's Information and Communications Technology (ICT) infrastructure at three public ICT centers including the central server room. Data on servers did not have offsite nor cloud back-up,[19] resulting in data losses and further complicating recovery efforts. Additionally official Government emails were down for several weeks, complicating post-disaster communications. As LAC countries seek to make their SPISs more

adaptive, they should also ensure that they have strong emergency protocols in place to support business continuity in post-shock environments. Some key principles to address this include:

- ***Ensure Offline Functionality for Key SPIS Processes*** as post-disaster environments compromise communication infrastructure and limit online functionality. This includes offline modules for social and beneficiary registry intake that could be uploaded once systems regain connectivity.
- ***Establish a Disaster Recovery and Business Continuity Plan*** to identify the potential impacts of different disaster events and to determine how resources will be allocated and distributed to ensure system continuity. This plan should include critical infrastructure elements, systems, and networks, essential for continuity of services and programs.[20] Post-disaster arrangements for data access and use, as well as options for contingency staffing arrangements should also be clearly established.
- ***Identify a Disaster Recovery Site***[21] independent of the principal system site which can be used for post-disaster operations. As disasters often result in structural and physical damage to hardware, servers and infrastructure, a separate physical disaster recovery site in an area of low hazard risk may be useful to explore as an option for a disaster recovery site and management of systems in post-disaster contexts. Of course, this implies financial and human resource costs which countries will need to assess. Periodic testing of systems at post disaster sites is also recommended.
- ***Back-up SPIS Information*** off-site and virtually (e.g. cloud storage) to mitigate against data losses in post-disaster environments. It is important to ensure that these back-up arrangements are secure and do not compromise the data in these systems. Routine monitoring of these back-up storage arrangements is also important to ensure they are functioning optimally.
- ***Ensure Effective Communication and Training on post-Disaster Protocols Ex-Ante*** so system users and staff are aware of the post-disaster arrangements and their respective roles, particularly given the complex nature of post-disaster operating environments.

5. **Continually Monitor and Evaluate System Use and Performance:** As countries increase and improve the use of their SPISs to address DRM objectives, it would be important to document lessons, and learn from them to improve the utility and performance of these systems. While this note recommends a series of potential actions to improve SPISs, these are not exhaustive. Furthermore, with each disaster event, countries will have additional lessons and identify additional constraints which were previously not anticipated. Introducing tools for continuous monitoring and evaluation will help ensure that these lessons are documented and feed into future system design. Useful tools include system assessments, process evaluations, stress tests etc. Establishing Key Performance Indicators (KPIs) and identifying responsibility for monitoring and reporting on them, will help ensure that system performance is continually monitored and better informs system-related policy decisions.

Concluding Message

The guidance note establishes that SPISs are importantly relevant to addressing DRM objectives. Each SPIS type on its own can help improve decisions and actions for risk identification, preparedness, risk reduction, response and financial protection. Additionally, when data from these SPISs are cross-referenced, or interoperable with DRIS data, the utility of these systems for improving resilience, coping and adaptation among poor and vulnerable households increases. The note establishes that the LAC region benefits from multiple SPISs including beneficiary and social registries, with some countries having multi-program and integrated SPISs at their disposal to support delivery processes. Nevertheless there remain gaps to the effective use of these systems for both regular SP delivery and to support ASP. Despite their utility, the use of different SPISs to inform DRM objectives and interoperability across SPISs and DRISs has been limited. These systems require sound design and clear protocols and arrangements to effectively support DRM objectives. The principles of sound data management, data quality, accessibility, security, strong legal frameworks, system interoperability and bi-directional data sharing are all critically important to ensure that SPISs effectively help address disaster risk.

Endnotes and References

1 The main messages here are primarily drawn from Leite, P. et al. 2017. *Social Registries for Social Assistance and Beyond: A Guidance Note & Assessment Tool* (World Bank). For additional lessons and best practices on these systems, please refer to that report.

2 Leite, P. et al. 2017. *Social Registries for Social Assistance and Beyond: A Guidance Note & Assessment Tool* (World Bank)

3 For additional lessons and best practices on social registry design and utilization, please refer to Leite, P. et al. 2017. *Social Registries for Social Assistance and Beyond: A Guidance Note & Assessment Tool* (World Bank)

4 These include Leite, P. et al, World Bank, 2017; Beazley, R. and Barca, V., Oxford Policy Management, 2018; Barca, V. and Chirchir, R., Department of Foreign Affairs and Trade (DFAT) Australia, 2014; Silva, V. et al, World Bank, 2010;

5 World Bank, 2015. *Moving Forward with Social Protection and Labor Systems in Latin America and the Caribbean*.

6 Fava, P. et al. 2010. *The Use of Geographic Information Systems for Disaster Risk Reduction Programmes in Africa*.

7 United Nations Office for Disaster Risk Reduction (UNDRR). 2012. *Using GIS for Disaster Risk Reduction*.

8 Ibid.

9 United Nations Office for Outer Space Affairs (UN-SPIDER). 2019. *Information Management for Disaster-Risk Reduction*.

10 The Chile reference includes information from: European Emergency Number Association (EENA), 2018. *Public Warning in Chile: EENA Case Study Document*; and Beazley, R. and Barca, V. 2018. *The Role of Data and Information for Adaptive Social Protection* (Oxford Policy Management).

11 United Nations Office for Disaster Risk Reduction (UNDRR). 2016. Report of the Open-Ended Intergovernmental Expert Working Group on Indicators and terminology Relating to Disaster Risk Reduction.

12 Post-disaster household assessments are discussed in more detail in a separate guidance note accompanying this series.

13 User Manual for the Single Victims Registry (*Manual de Usuario Registro Único de Damnificados*)

14 Leite, P. et al. 2017. *Social Registries for Social Assistance and Beyond: A Guidance Note & Assessment Tool* (World Bank)

15 Beazley, R. and Barca, V. 2018. *The Role of Data and Information for Adaptive Social Protection* (Oxford Policy Management).

16 For instance, the Inter-Agency Standing Committee has established *Guidelines on Common Operational Datasets in Disaster Preparedness and Response* which outline the common datasets needed for response in humanitarian emergencies and outlines a governance model for the management of the data. While SP responses to emergencies and disasters often follow humanitarian responses, it would be useful explore how SPISs can build on or contribute to these datasets where these guidelines are being adhered to, and are operational.

17 For more on these constraints, please refer to Barca V. and Beazley R. (2019). B*uilding on Government Systems for Shock Preparedness and Response: The Role of Social Assistance Data and Information Systems*. Commonwealth of Australia, Department of Foreign Affairs and Trade; and Barca, V. (2017) *Integrating Data and Information Management for Social Protection: Social Registries and Integrated Beneficiary Registries*. Commonwealth of Australia, Department of Foreign Affairs and Trade.

18 Beazley, R. and Barca, V. 2018. *The Role of Data and Information for Adaptive Social Protection* (Oxford Policy Management).

19 Government of the Commonwealth of Dominica. 2017. *Hurricane Maria Post-Disaster Needs Assessment*.

20 Segui, F. 2017. *Strengthening Jamaica's Social Protection System for Disaster Preparedness and Response: Information Systems Assessment Final Report.* (World Bank)

21 Ibid.

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