



Comparative analysis of the efficiency of different social protection delivery mechanisms in the context of climate resilience

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- Supporting public planning processes in delivering climate-resilient development outcomes for the poorest
- Supporting climate change negotiators from poor and vulnerable countries for equitable, balanced and multilateral solutions to climate change
- Building capacity to act on the implications of changing ecology and economics for equitable and climate-resilient development in the drylands.

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This paper attempts to analyse the efficiency and effectiveness of the various social protection delivery mechanisms with reference to climate resilience, and also examines the sufficiency of social protection finance in meeting climate resilience and sustainable development outcomes.

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Executive Summary

Background

Social protection has evolved since the 1990s, when safety nets were used to reduce the impact of economic restructuring on the poorest groups in developing countries, to focus today on addressing high unemployment, old age security, child nutrition, and so on. Mechanisms include cash transfers, social pensions and school feeding programmes. Globally, the benefits of social assistance programmes reach close to 25% of the vulnerable. In 2017, more than US\$500 billion was spent on social assistance in lower- and middle-income countries.

Evidence from research on existing programmes shows that, with some adjustments, social assistance can help communities better absorb the effects of climate risks, adapt to climate impacts, and transform their capacities and strategies to address growing climate stresses. IIED research shows that in India, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), has helped poor communities cope with multidimensional poverty and marginalisation.

While the overarching goal of all social assistance instruments is to address the vulnerability of poor households and individuals, they vary in their form, coverage and efficiency. Within the context of growing financial constraints in low-income countries it is important to understand which of the different social assistance delivery mechanisms will be most effective in building resilience, so as to optimise resources for these measures. There is also a need to inform the growing debate, in countries such as India, on the role of different social assistance delivery mechanisms in addressing climate and development outcomes. Against this backdrop, this paper strives to achieve the following objectives:

- (1) Analyse the efficiency and effectiveness of the various mechanisms for delivering social assistance programmes on a global scale in addressing climate resilience outcomes; and
- (2) Examine the adequacy of social assistance programme financing to achieve climate resilience and development outcomes.

Methodology

The study uses both quantitative and qualitative analyses. Efficacy indicators – namely coverage, benefit incidence, benefit adequacy, average per capita transfer, and benefit-cost ratio – are used to compare the performance of different social assistance programmes in different countries across different climate risk and vulnerability categories using frequency and regression analysis. Selected countries, grouped into five categories from very low risk to very high risk, are based on the INFORM Risk Index 2020 (covering hazards and exposure, vulnerability and lack of coping capacity). The quantitative efficacy analysis covers 122 countries. The social assistance programmes of seven countries covering various climate risk categories, namely Poland (very low risk), Argentina (low risk), Ecuador (medium risk), India (high risk), Ethiopia (high risk), Chad (very high risk) and South Sudan (very high risk), were then selected for the qualitative analysis. The qualitative analysis discusses factors contributing to the success of social assistance programmes in different risk contexts; the effectiveness of mechanisms in delivering preventive, protective, promotional and transformative functions of climate resilience; and the level of integration of climate resilience in social assistance programmes. Data were sourced from open data sources such as ASPIRE: The Atlas of Social Protection Indicators of Resilience and Equity (World Bank, 2017), the INFORM Report (2020), and the World Bank's Gross Domestic Product (GDP) per capita database (2020). The INFORM Risk Index was used to represent climate risks and vulnerabilities.

Results

Frequency analysis

Predominant social assistance instruments.

Unconditional cash transfer (77.87%) is the predominant instrument used in countries across all risk categories. Public works, food in kind and school feeding are predominant in very high-risk countries (eg Chad and South Sudan) and high-risk countries (eg India and Ethiopia). Cash transfers and social pension have a bigger share of social assistance instruments in lower-risk countries (eg Poland and Argentina).

Figure 1. Consolidation of efficacy parameters of different social assistance instruments

Social assistance instrument	Coverage	Benefit incidence	Benefit adequacy	Average per capita transfer	BCR
All instruments	77.47%	36.12%	50.31%	\$2.55	0.23
Conditional cash transfers	91.22%	24.91%	30.15%	\$0.72	0.18
Unconditional cash transfers	49.15%	48.91%	55.26%	\$3.64	0.32
Social pension	29.68%	28.76%	49.46%	\$2.03	0.16
School feeding	78.67%	38.01%	7.04%	\$0.14	0.76
Public works	19.02%	75.25%	32.42%	\$0.19	0.68
Food and in kind	89.32%	54.97%	12.73%	\$0.36	0.62
Fee waivers	41.96%	21.54%	14.16%	\$1.01	0.05

■ Very low-risk countries ■ High-risk countries
■ Low-risk countries ■ Very high-risk countries
■ Medium-risk countries

Figure inside the cell indicates the highest value among the risk categories

Figure 1 summarises the frequency analysis on the efficacy of different social assistance delivery mechanisms. The highest values of efficacy parameters in the five risk categories for different types of social assistance instruments are shown in the figure.

Coverage is the ability of the programme to reach the extreme poor, from among the most vulnerable population in a country. It is better in countries with lower risk (eg Poland and Argentina) for all social assistance instruments except public works and fee waivers, for which the countries with higher risks (eg Chad, South Sudan, Ethiopia and India) have the highest coverage value. The countries with lower risks have superior institutional capacities and hence are able to achieve higher target accuracies.

Benefit incidence explains to what extent the non-poor are excluded by the programmes, and a higher value reflects a better efficacy of the programme. Overall, benefit incidence shows mixed results, but public works programmes implemented in very high-risk countries record the highest benefit incidence value (75.25%) among all programmes. This indicates that the public works programmes, by design, are highly capable of avoiding inclusion of the non-poor.

The two indicators **benefit adequacy** and **average per capita transfer** represent the 'size of the transfer benefits' to the target population. Except for public works, for all other instruments the value of benefit adequacy and average per capita transfer is highest for

countries with lower risks (eg Poland and Argentina). Countries with better financial resources perform well on these indicators.

Benefit-cost ratio indicates the reduction in the poverty gap achieved for each dollar spent on social assistance programmes. When considering all social assistance instruments, the benefit-cost ratio value is highest for countries with higher risks (eg Chad, South Sudan, Ethiopia and India). This indicates that countries with higher risk, which have a higher proportion of the poor, are able to achieve a higher reduction in poverty and vulnerability for each dollar spent on social assistance programmes compared to countries with lower risks. School feeding (0.76), public works (0.68) and food and in-kind (0.62) programmes implemented in the higher-risk countries (eg Chad, South Sudan, Ethiopia and India) have the greatest benefit-cost ratio value among all programmes.

Regression analysis

The regression analysis shows that higher programme spending on conditional cash transfers, unconditional cash transfers and social pensions programmes have a greater likelihood of reducing the vulnerability of poor communities. Similarly, higher benefit size and better target accuracy of the social assistance programmes have greater probability of reducing people's vulnerability.

Simulations with estimated values derived from regression modelling show that, for higher-risk countries, an immediate shift to cash transfer programmes that aim at reducing vulnerabilities on a par with lower-risk countries will require substantial increases in spending, which, given the size of their economies and large vulnerable populations, may not be financially feasible.

Qualitative analysis

The qualitative analysis shows that social assistance interventions in countries with higher risks (eg Chad, South Sudan) do not produce desired results in reducing poverty and vulnerability due to higher poverty levels, greater exposure to hazards, poor administrative and financial capacities, and lack of adequate infrastructure.

While a majority of the countries have comprehensive social assistance and climate change policies, in most cases, these are not integrated. Only in a few instances, like in the public works programmes of India (MGNREGS) and Ethiopia's Productive Safety Net Program (PSNP), are climate adaptation activities included as unintended benefits. Although social assistance programmes help households to cope with short-term climate-related stresses, in the present form they are not sufficient to build long-term adaptive capacities among vulnerable communities. The analysis also identified that the existing social assistance programmes lack preparedness against disasters, and emphasised the need for designing shock-responsive social assistance systems.

Strategies for enhancing efficiency and adequacy for social assistance programmes

Maximising the value of social assistance investments through the right mix of delivery instruments most suited to the local context. For higher-risk category countries, like Ethiopia and India, social assistance instruments that require lower average per capita transfer amounts, and produce higher BCR, could be implemented along with cash transfer programmes. Instruments such as public works, food, in-kind and school feeding have substantially higher BCR and less average per capita transfer values when compared to cash transfer programmes.

Integrating shock-responsive mechanisms within existing social assistance instruments. In the event of shocks like COVID-19 that can impact the livelihood support base of poor families, social assistance initiatives like public works programmes can provide shock-responsive safety nets, in the form of cash or food, and can also create assets for long-term resilience. Putting a system in place, and building resilience before a crisis hits, is more cost effective than responding later with a humanitarian response.

Creating safety nets through global businesses and supply chains. In the context of least developed countries (LDCs), where countries are already struggling to finance universal social assistance, the responsibility of social assistance coverage and access to basic facilities for workers could be shared by global supply chains. There are many global brands that source products from supply chains that are free from slavery and provide decent working conditions. Global brands can support the creation of social safety nets for people working in their supply chains in LDCs, through insurance, health cover and employment security.

Leveraging climate finance to support climate resilience instruments within social assistance programmes. Climate finance can offer greater quantity and quality of finance to scale up the contribution of social assistance programmes towards climate resilience, and help manage climate-induced financial risks. Countries could consider using climate finance from the National Climate Change Missions, the National Adaptation Fund, and international sources to integrate climate risk management into social assistance programmes. These resources could help meet the additional costs of creating climate-resilient infrastructure and skills.

Domestic resource mobilisation for universal social assistance coverage. Social assistance spending is constrained by a low revenue base and low tax-to-GDP ratios impacting domestic resource mobilisation. There is a need for greater coherence across social assistance programmes, and optimisation of existing funds, with the view of achieving universal social assistance coverage. The resource mobilisation for social assistance instruments can also be done by diverting energy subsidies and carbon revenue to support the climate resilience aspects of these programmes.

1

Introduction

1.1 Context

Climate change has more adverse consequences for the poorest.

Climate change is already manifesting itself in many ways, often with the most severe consequences for the poor and vulnerable. The Emergency Events Database (EM-DAT) recorded US\$2.97 trillion losses from disasters between 2000 and 2019, however high-income countries experienced the lowest level of losses as a percentage of gross domestic product (GDP), in comparison to low-income countries where the losses were 0.61%, ie three times higher than in high-income countries (CRED, 2020). In the last year, the increased impacts of climate change and COVID-19 have brought the complex and interrelated nature of climate change crises into sharp focus.

As impacts of many climatic events are expected to last from several months to years, poor countries and communities are especially at risk of being overwhelmed by multiple concurrent crises, leaving them less resilient to additional shocks. This can push disadvantaged communities into situations where their vulnerability to adverse coping strategies – like sale of productive assets (such as land and livestock), distress migration, exposure to slavery and withdrawing children from school – further compound the impacts of the crisis, pushing many households into a long-term vicious cycle of debt and poverty. It is projected that in a ‘business-as-usual’ scenario, climate change will drive 100 million more people into extreme poverty by 2030 (World Bank, 2016), and the ongoing COVID-19 crisis will result in an

additional 49 million people being pushed into extreme poverty in 2020 (Mahler et al., 2020).

Adaptive social protection (ASP) has emerged as an effective strategy for building the resilience of poor and vulnerable households to shocks.

Social protection programmes form part of the core development strategies used by governments across the globe to alleviate poverty, achieve social cohesion and sustain economic growth. Social protection is envisaged as complementing programmes designed to promote climate resilience by reducing vulnerability, providing a stepping stone towards climate-resilient livelihoods, and supporting inclusive disaster preparedness (FAO and Red Cross Red Crescent Climate Centre, 2019). Nearly 45% of the world’s population are covered by at least one social protection benefit, while benefits of social assistance programmes reach close to 25% of the vulnerable population (ILO, 2017a).

In 2017, more than US\$500 billion is spent in lower- and middle-income countries to support large-scale social assistance by governments and international donors (Norton et al., 2020). Social protection programmes help to diversify livelihood options for poor and vulnerable populations as well as give them an opportunity to practice less resource-intensive livelihood options. They can help poor and vulnerable households by investing in their capacity to prepare, cope and recover from shocks; building their resilience; and ensuring that they do not get trapped into poverty as a result of the impacts of recurring climate crises. Research work by Kaur et al. (2019) for IIED shows that social assistance

BOX 1: EVOLUTION OF SOCIAL PROTECTION

The concept of social protection has been evolving as societies change. Initially the aim of public assistance was poverty reduction by providing safety nets. In the early 20th century development of wage labour and decline of indigenous social protection mechanisms were notable social changes.

Responding to this, governments started to focus on providing income security in the form of savings and insurance schemes. Over time social protection started to cover a broader range of risks, such as unemployment, ageing, workplace accidents, health problems, homelessness etc. Today, social protection is at the next phase of its evolution:

People are facing numerous challenges such as climate change, greater poverty, high unemployment, changing social structures, ageing, drain of natural resources etc., and governments are re-examining their social protection systems and policies to respond to the new challenges (Bonilla Garcia and Gruat, 2003).

programmes, like India's MGNREGS, have helped poor households and communities cope with poverty and marginalisation.

With some adjustments, social protection programmes can help target households to absorb the effects of climate risks, adapt to climate impacts and transform their capacities and strategies to address growing climate stresses. This recognition has led to questions on how best to equip social protection programmes to help households deal with different kinds of shocks. There is a need to provide policymakers with evidence on what changes (in existing planning and delivery mechanisms) are needed for existing social protection systems to enhance these outcomes, and make them more prepared in advance for the next crisis.

The benefits of social assistance are well recognised but face significant financing constraints, with low investment, limited coverage and inadequate protection. Higher allocations to social protection are required to achieve long-term reductions in poverty and build resilience against climate risks; however most middle- and low-income countries have low levels of domestic resource mobilisation, as well as a large number of competing government priorities that are likely to limit the fiscal resources available for social protection. In response to COVID-19, while the rich G20 nations were able to inject \$9.8 trillion into their economies, the majority of low- and middle-income countries were constrained

in protecting their people and economies. In all, while countries around the world raised \$11.7 trillion in additional spending to cope with COVID-19, 83% was mobilised by 36 rich countries against just \$42 billion (0.4%) in 39 lower-income countries (IMF, 2020). An Oxfam briefing paper presents that 28 rich countries spent at the rate of \$695 per person, whilst in contrast, 42 low- or middle-income countries spent from \$28 to as little as \$4 per person (Barba et al., 2020).

Prior to the coronavirus pandemic, according to the International Labour Organisation (2017), up to four billion people lacked social protection. As per World Bank estimates, an additional 1.3 billion people were covered during COVID-19, leaving about 2.7 billion still uncovered. Barba et al. (2020) show that the emergency responses in 81% of the countries covered less than half their population through social protection. In 29% of the countries, fewer than one in ten people have been protected. The study observed that a majority of the benefits analysed are short-lived and inadequate for covering even basic needs. In Colombia, for example, a recently introduced scheme is reaching three million households of informal workers with a monthly transfer equivalent to only 2.5 days at the national minimum wage.

A range of social protection delivery instruments are available with varying level of effectiveness in different contexts, and resources need to be optimised behind those that are more efficient.

The social protection programmes generally fall in the following three categories (World Bank, 2018):

- Social assistance/social safety net programmes are non-contributory interventions that help households and individuals manage enduring poverty, vulnerability and destitution. They are meant to cover vulnerable segments of the community.
- Social insurance programmes are contributory interventions that help households and individuals cope with unexpected shifts in income attributed to old age, diseases, disability and natural calamities. The users pay insurance premiums to be eligible for coverage.
- Labour market programmes, which can either be contributory or non-contributory. These programmes help safeguard households and individuals against income loss due to unemployment or enable the individuals to gain skills and link to labour markets.

The different categories of social protection programmes are as presented in Figure 2.

Although the overarching goal of all social assistance instruments is to address the vulnerability of poor households and individuals, they vary in their form, coverage and efficiency. Within the context of growing

Figure 2. Categories of social protection programmes. Source: World Bank (2018)

Social assistance/social safety nets (non-contributory)	Social insurance (contributory)	Labour market programmes (contributory and non-contributory)
<ul style="list-style-type: none"> • Unconditional cash transfers • Conditional cash transfers • Social pensions • Food and in-kind transfers • School feeding programmes • Public works (eg MGNREGS) • Fee waivers and targeted subsidies • Social services 	<ul style="list-style-type: none"> • Contributory old-age, survivor and disability pensions • Sick leave • Maternity/paternity benefits • Health insurance coverage • Other contributory insurance programme 	<ul style="list-style-type: none"> • Active labour market programmes (training, employment intermediation, wage subsidies etc) • Passive labour market programmes (unemployment insurance, early retirement incentives etc)

BOX 2. SOCIAL PROTECTION VS SOCIAL ASSISTANCE

In developed countries, social insurance and labour market regulation are given greater emphasis, and social assistance is considered as residual. In many developing countries, social insurance is limited in its coverage to workers in formal employment, labour market regulation is poorly enforced, and basic services are insufficient and highly unequally distributed. Here, social assistance can be the most significant component of social protection, and is far from residual. This paper examines social assistance programmes and policies which focus on vulnerable households and help reduce deficient consumption, facilitate investment in human and physical assets, and strengthen the agency of the poor; for example by empowering them to overcome social exclusion. This applies to a range of social assistance instruments, but especially to transfers in kind or cash (Barrientos, 2009). Hence the current research, in its economic analysis, will focus on social assistance programmes. The analysis aims to compare the efficacy and effectiveness of different social assistance instruments to address risks and vulnerability in the context of climate change. Though the terms social protection and social assistance have been used interchangeably throughout the paper, they both represent social assistance programmes.

financial constraints in low-income countries, it is important to understand which of the different social assistance delivery mechanisms will be most effective in building resilience so as to optimise resources provided for those measures.

While limited research evidence exists on the relative efficiency of social assistance instruments in the context of enhancing climate resilience, the statistics indicate that unconditional cash transfers (UCTs) are the most prevalent and increasingly gaining the attention of policymakers. Policy environments in developing countries are tilting in favour of periodic and unconditional cash transfers. The shift of social assistance instruments towards UCTs needs to be approached with caution however, as some initial evidence of their success shows they may be context specific. Critics worry that a complete shift to UCTs will undermine an already fragile social assistance architecture, cause the rural workforce to drop out of the labour force, and increase wasteful spending in developing countries (Khosla, 2018).

The current debate does not consider climate resilience within the ambit of development outcomes of social assistance initiatives. There is a need for deeper analysis of the climate resilience outcomes of different social assistance delivery mechanisms, eg by determining the impact on both government (institutional, governance and fiscal capacity) and community (climate, economic and social outcomes). Generating empirical evidence will help inform the growing debate on the role of unconditional transfers alongside other delivery mechanisms, or a combination of them, in addressing climate and development outcomes. This research is carried out against this backdrop. Key research areas of the study are therefore:

- To analyse the efficiency and effectiveness of the various mechanisms for delivering social assistance programmes on a global scale in addressing climate resilience outcomes, and
- To examine the adequacy of social safety net financing to achieve climate resilience and development outcomes.

BOX 3. INDIA'S PROPOSAL ON A UNIVERSAL BASIC INCOME (UBI) SCHEME

In the last few years the concept of UBI unconditional cash transfers, given at periodic intervals to all citizens, has gained traction among policymakers in developing countries as a mechanism for social assistance and poverty reduction. In India, catalysed by the establishment of a biometric database and by the bank account coverage for a large proportion of the adult population, the idea of UBI has been extensively debated by economists, policymakers and policy advocates. The Economic Survey 2016–17, brought out by the Ministry of Finance in India, strongly advocated the introduction of UBI (Ministry of Finance, 2017). The report argues that UBI will improve operational efficiency, reduce selection errors, and arrest leakages in delivery of development programmes. However, critics point out that the design features of UBI are guided by weak foundations and emphasise that the scheme should be implemented after a deeper analysis (Khosla, 2018). In this context, the present research, in addition to analysing the performance of social assistance delivery mechanisms in light of climate resilience, will also attempt to study the feasibility of programmes with design features similar to UBI assistance programmes.

1.2 Research approach

The present research attempts to measure the comparative efficacy and effectiveness of different mechanisms of social assistance programmes globally in relation to climate change. This necessitates measuring climate resilience at the country level. While a number of micro-level studies that investigate the effectiveness of social assistance instruments on climate risks and vulnerabilities are available, country-level studies are more limited. The available country-level studies have also generally adopted qualitative inferential analysis. Hence, appropriate qualitative and quantitative indicators that measure climate change resilience at country level need to be identified for this study.

To examine the efficacy of different social assistance instruments in delivering climate resilience outcomes, it is important to define climate change so that appropriate indicators can be selected to assess its impacts. Fussel (2005) described the features of climate change as follows:

1. Climate change is a continuous process. It may either increase or decrease baseline risk levels. Hence, assessments of risks associated with climate change need to express risk levels in comparison to a baseline scenario.
2. Climate change is a long-term process caused by anthropogenic activities and leads to global warming. It requires a dynamic assessment framework that accounts for uncertainty in future hazard levels and changes in all groups of vulnerability factors over time.
3. Climate change typically has multiple effects on societies and other vulnerable systems. For that reason, comprehensive characterisations of the vulnerability of a system to climate change generally require the use of multiple metrics.

4. Climate change comprises three distinct components, namely exposure, sensitivity and capacity to adapt.

The choice of indicators for measuring climate risks and vulnerabilities in this study is guided by Fussel's definition. The research selected the INFORM Risk Index (INFORM Report, 2020) to represent climate risks and vulnerabilities. INFORM is a composite indicator that identifies countries at risk of humanitarian crisis and disaster that would overwhelm national response capacity. The INFORM model is based on risk concepts published in scientific literature and envisages three dimensions of risk: hazards and exposure, vulnerability, and lack of coping capacity. The dimensions of risk aggregate 54 core indicators across natural, human, socioeconomic, vulnerable groups, institutional and infrastructure categories. Any changes in the INFORM methodology are always applied to at least five previous years of data to preserve the consistency of the trend. The INFORM Risk Index fulfils most of the criteria set by Fussel to measure climate change outcomes.

The INFORM Risk Index lacks an adaptive capacity element in its design, which limits the research in measuring climate risk levels, although it needs to be noted that gauging adaptive capacity through country-level indicators is conceptually challenging. Vincent (2007) points out that though there are numerous research efforts aimed at elaborating country-level adaptive capacity, primarily with a view to helping global-level decision making, they have encountered data and conceptual problems in characterising adaptive capacity. The indicators that are developed based on data-driven approaches have inherent limitations to measure adaptive capacity, as adaptive capacity per se lacks the element of tangibility (Niemeijer, 2002). Rather, a theory-driven approach that uses theoretical insights into the nature and causes of adaptive capacity to select variables for inclusion is a more feasible method to describe adaptive capacity (Vincent, 2007).

Table 1. Suitability of the INFORM methodology to the climate change criteria

CHARACTERISTIC OF CLIMATE CHANGE	FEATURES OF THE INFORM METHODOLOGY TO SUIT TO THE CLIMATE CHANGE CRITERION
Climate change is a continuous process.	The methodology offers time series data that facilitate articulation of risk levels in relation to a baseline.
Climate change is a long-term process caused by anthropogenic activities and leads to global warming. It requires a dynamic assessment framework that accounts for uncertainty in future hazard levels and changes in all groups of vulnerability factors over time.	The index not only measures losses due to hazards, it includes long-term indicators such as the Human Development Index (HDI), Multi-Dimensional Poverty Index (MPI), Gender Inequality Index (GII), infant mortality rate (IMR) etc, which offer a dynamic element to the model to explain the uncertainty in future hazards.
Climate change may have multiple effects on a system.	The INFORM Risk Index is a composite indicator of 54 indicators that represent different dimensions and categories of risks.
Climate change comprises three distinct domains, namely exposure, sensitivity and capacity to adapt.	The INFORM methodology envisages three dimensions of risk: Hazards and exposure, vulnerability and lack of coping capacity. However, it does not include the element of capacity to adapt.

Hence, the present research undertakes a qualitative inferential analysis to understand the effect of social assistance programmes on adaptive capacity. The qualitative inferential analysis makes use of the resilience framework advocated by Ulrichs et al. (2019). The framework distinguishes between absorptive, adaptive and transformative resilience:

- **Absorptive resilience:** a system's ability to maintain its original structure by absorbing infrequent and low-magnitude climate risks
- **Adaptive resilience:** a system's ability to improve its original structure to manage present and future risks and bounce back better when shocks occur
- **Transformative resilience:** a system's ability to fundamentally change its structure to move beyond vulnerability thresholds.

1.3 Structure of the document

Chapter 1 has explored gaps in the existing social assistance interventions in addressing risks and vulnerabilities associated with climate change, and has also presented the research approach adopted in the work. Chapter 2 presents a comparative cost-benefit analysis of different social assistance delivery mechanisms on select efficacy parameters in the light of climate risks and vulnerabilities. Chapter 3 discusses qualitative aspects that determine efficacy and effectiveness of the social assistance programmes to promote climate resilience, and the significance of climate resilience in design features of social assistance programmes. Chapter 4 examines the feasibility of introducing the universal basic income scheme in India through a climate resilience lens. Chapter 5 builds on from the findings of the current research and recommends strategies for enhancing the efficiency and adequacy of social assistance programmes in delivering climate resilience.

2

Cost-benefit analysis of social assistance programmes

In this chapter, the comparative analysis of efficacy indicators across different country risk categories for different types of social assistance programmes is presented, based on two types of statistical analysis, namely frequency analysis and regression analysis. Climate risks are represented by the INFORM Risk Index in both the analyses. The countries are categorised based on the volume of the risk index. Criteria for the risk categorisation are presented in Table 2.

Table 2. Criteria for INFORM Risk Index categorisation

SERIAL NUMBER	RISK CATEGORY	INFORM RISK INDEX RANGE
1.	Very low risk	0–1.9
2.	Low risk	2–3.4
3.	Medium risk	3.5–4.9
4.	High risk	5–6.4
5.	Very high risk	6.5–10

2.1 Frequency analysis

The analytical framework adopted by the World Bank (2018) in the 'State of Social Nets Report' is used in this research to compare the efficacy and effectiveness of different social assistance delivery instruments. The OECD (2019) followed this framework to review social assistance systems in Indonesia. This framework includes the following efficacy parameters:

- Coverage
- Benefit incidence
- Benefit adequacy
- Cost effectiveness
- Distributional effects represented by benefit-cost ratio (BCR)

Guided by the World Bank (2018), the following social assistance instruments are considered for the analysis among the different programmes implemented by the countries:

- Conditional cash transfers
- Unconditional cash transfers
- Social pensions
- School feeding
- Public works
- Food and in-kind
- Fee waivers.

A detailed methodology including efficacy indicators and formulae used for the analysis, and the list of countries considered for the analysis are presented in Annex 1.

A graph showing the countries considered for the analysis, based on the availability of data, with classification based on INFORM risk categories is presented in Figure 3.

Based on the data available, 122 countries are considered for the comparative efficacy analysis. The average risk index for all the countries is 4.19. Figure 3 presents the average risk index value and the number of countries considered within each of the INFORM risk categories.

2.1.1 Social assistance programme instruments adopted by the countries

Every country has its own combination of welfare programmes. Figure 4 presents the various types of programmes adopted under each risk category.

Unconditional cash transfer (77.87%) is the most predominant instrument adopted among countries in all the risk categories, followed by social pensions (62.30%), food and in-kind (60.66%) and fee waiver (50.00%) programmes.

Figure 3. Average INFORM Risk Index value

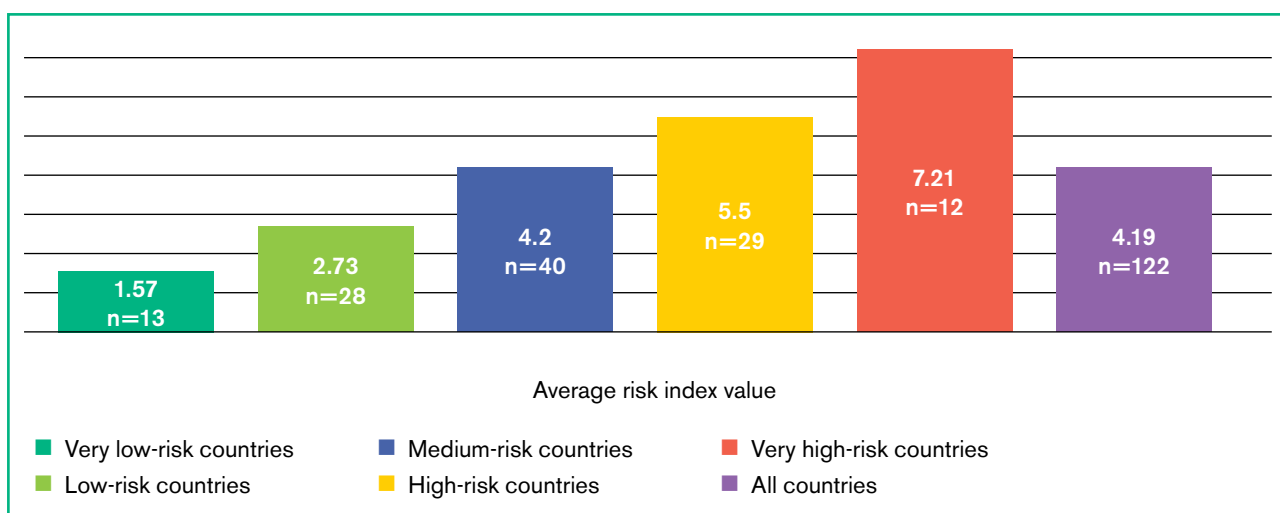
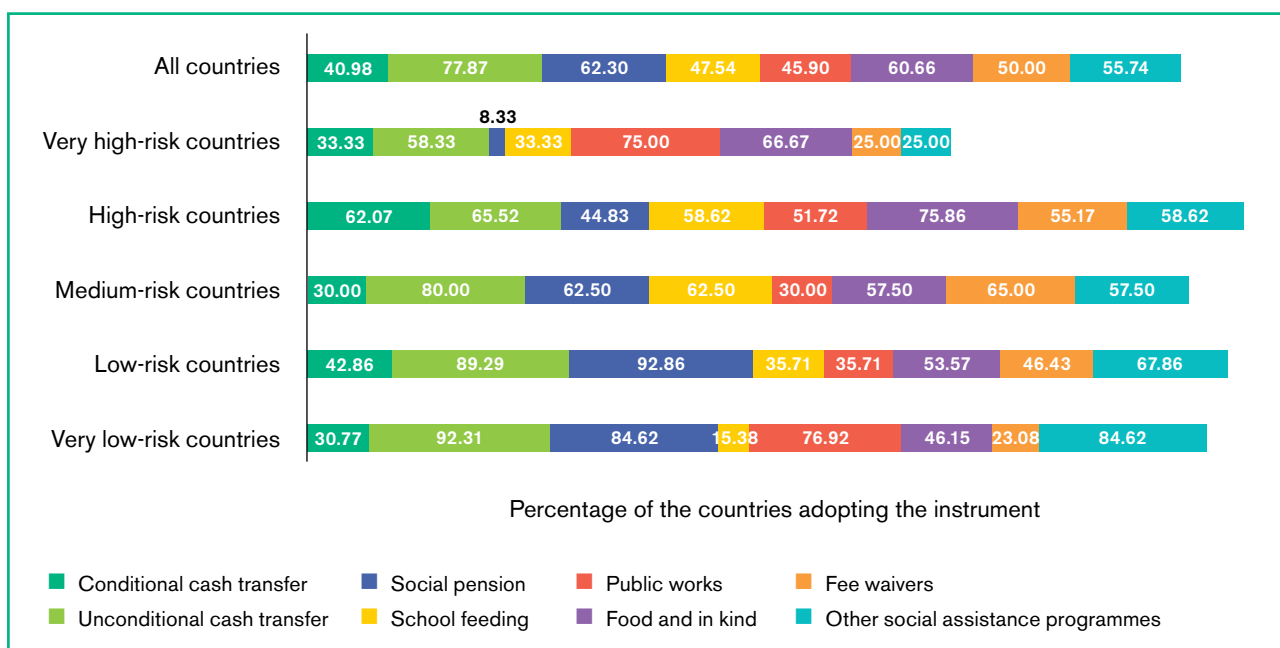


Figure 4. Social assistance programme instruments adopted by the countries



2.1.2 Comparison between the risk categories

In this subsection a comparison is made of the performance of the different social assistance delivery mechanisms based on efficacy indicators.

a. Spending as percentage of GDP

The average social assistance spending of all the countries considered for the analysis is 1.55% of GDP. No significant variation is observed in the value of spending on social assistance programmes across the five risk categories, ie 'very low-risk' category (1.45%), 'low-risk' category (1.79%), 'medium-risk' category (1.71%), 'high-risk' category (1.07%) and 'very high-risk' category (1.71). However, the categories do differ substantially between each other in terms of the value of funds spent under the programmes.

The percentage of funds spent on social assistance as percentage of total GDP is highest for social pension (0.69%) programmes, followed by unconditional cash transfer (0.43%), fee waiver (0.35%), and food and in-kind (0.25%) programmes. The programmes most preferred by countries with lower risk are social pensions, unconditional cash transfers and conditional cash transfers, and in the regression analysis these programmes are significantly associated with vulnerability. Instruments such as food and in kind,

public works and fee waivers are preferred in countries with higher risk.

b. Coverage among the extreme poor (<\$1.9 a day)

Coverage indicates the levels of reach of programmes among the most vulnerable in the population. The higher the value, the better the programme coverage in percentage terms among the vulnerable in the population. Coverage helps measure target accuracy and exclusion errors.

Overall, all instruments across all risk categories are able to cover 48.12% of the extreme poor. 'Very low-risk' and 'low-risk' countries are able to reach their vulnerable populations through social assistance programmes better than the 'high-risk' and 'very high-risk' countries. The highest coverage is observed among the 'very low-risk' countries (77.47%) while the programmes in 'very high-risk' countries cover only 9.9% of the eligible people.

Conditional cash transfer programmes are observed to cover the highest percentage (46.80%) of the extreme poor population. This is followed by school feeding (44.14%), food and in-kind (30.3%), and fee waiver (27.87%) programmes. Public works programmes cover the lowest proportion of the extreme poor (12.32%).

Figure 5. Spending on social assistance programmes as a % of GDP

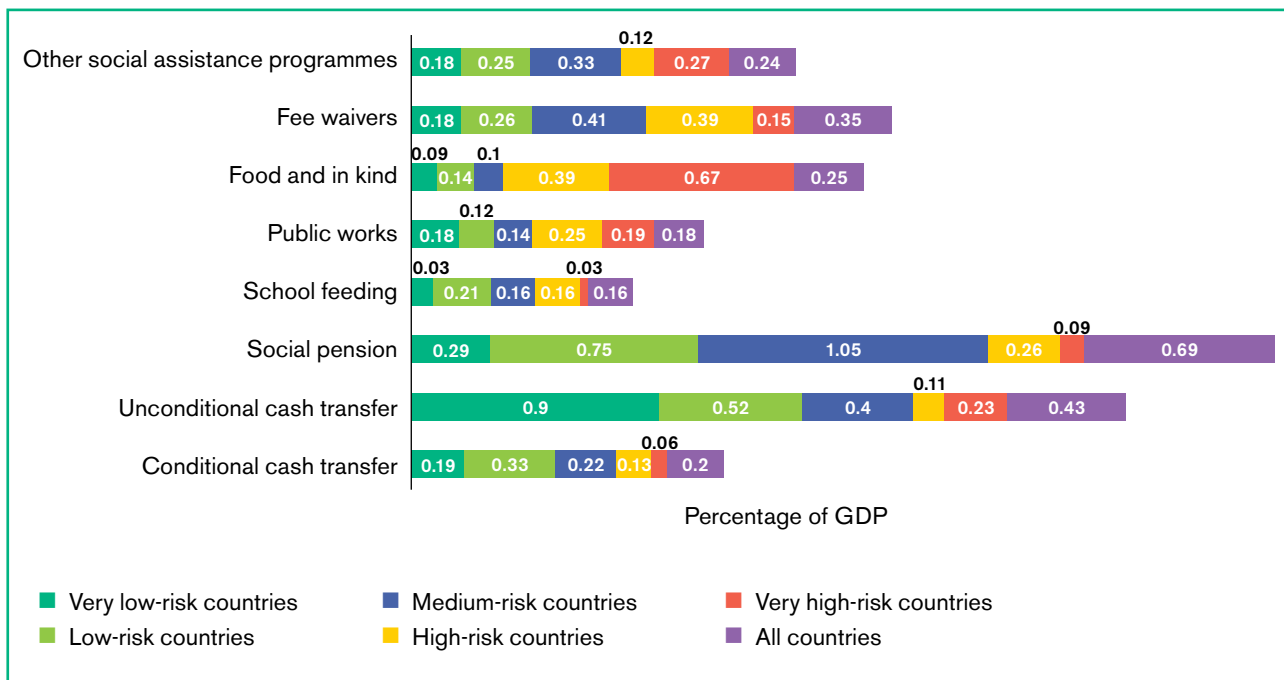
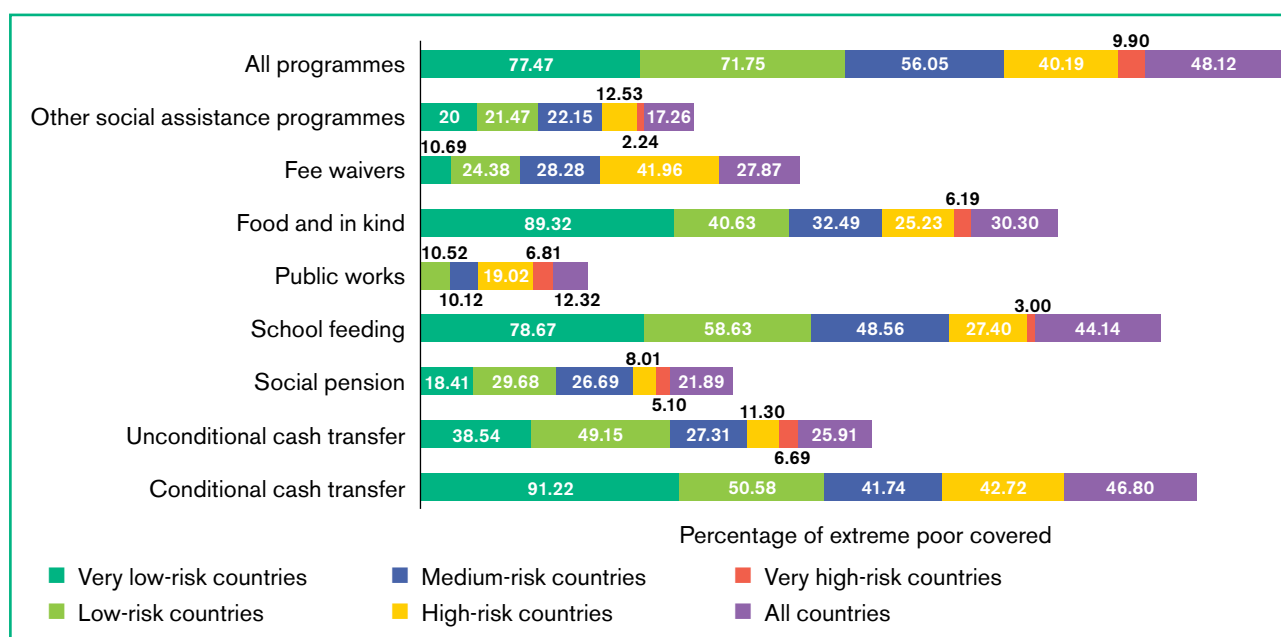


Figure 6. Coverage of the social assistance programmes among the extreme poor (<\$1.9 a day) (%)



c. Benefit incidence among the extreme poor (<\$1.9 a day)

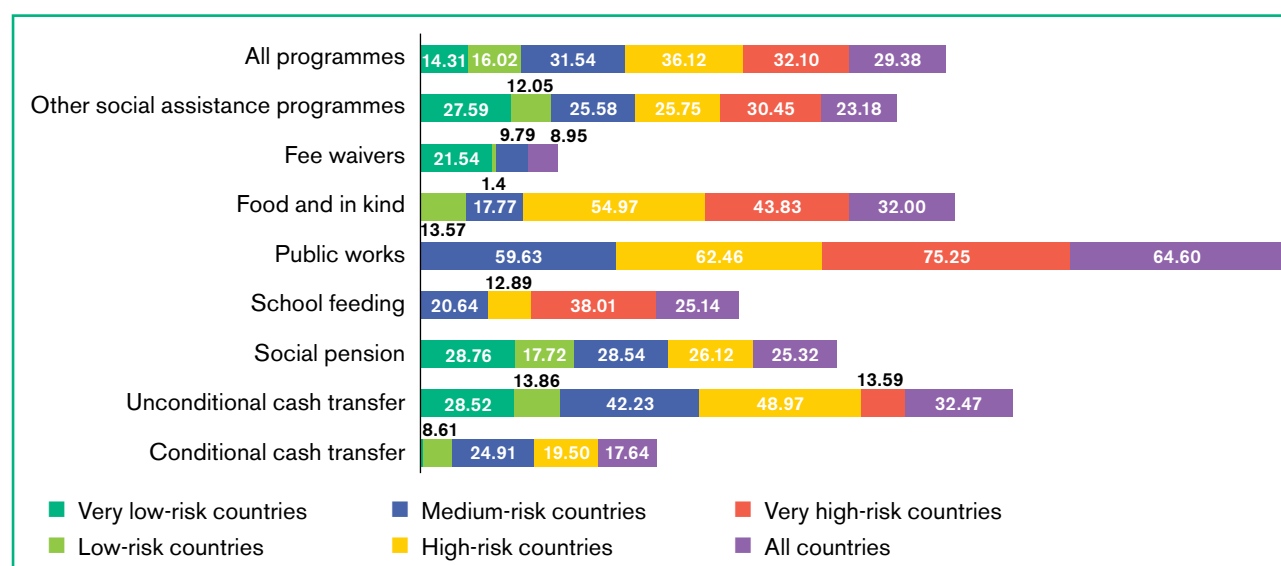
The analysis of benefit incidence attempts to understand what percentage of programme benefits are distributed among the different income categories of the population. The analysis considers which income group of the total population receives the major volume of benefits and helps understand inclusion error.

The benefit incidence of social assistance programmes is higher in countries with high-risk and vice versa. The indicator's value is the highest for 'high-risk' countries (36.12%) and the lowest for 'very low-risk countries' (14.31%). The countries with higher risk cover a lower percentage of the non-poor through social

assistance programmes than countries with lower risk. This could be because of the higher incidence of poverty in the high-risk countries than in the low-risk countries, providing a larger pool of eligible population for coverage. For example, in Poland (very low-risk category) poverty head count ratio is only 0.2% of the total population while the same figure is 38.1% in Chad (Source: INFORM Risk Report, 2020).

Overall, social assistance programmes target 29.38% of the poorest persons. Among the different instruments, the benefit incidence value is highest for public works programmes (64.60%), followed by unconditional cash transfer (32.47%), food and in kind (32.00%), social pension (25.32%) and school feeding (25.14%). Public works programmes involve recipients'

Figure 7. Benefits incidence in the extreme poor (<\$1.9 a day) (%)



physical work. It can be assumed that economically well-off people will be less likely to participate in such labour-intensive programmes.

d. Adequacy of benefits among the extreme poor (<\$1.9 a day) (%)

The analysis on adequacy¹ of benefits among the extreme poor compares the proportion of programme benefits in relation to certain benchmark values (eg average income/consumption, below-poverty income and so on) among different social assistance instruments in each risk category. It is a measure of relative benefit level. Adequacy provides an indication of the extent to which the size of advantage is small or large relative to the benchmark values.

Benefit adequacy is 36.22% for all programmes, across all risk categories. The benefit adequacy percentage, considering all social assistance instruments together, is higher for the countries with lower risk and vice versa. The value is highest among the ‘low-risk’ countries (50.31%) followed by ‘very low-risk’ countries (42.16%). This indicates that social assistance programmes of countries with lower risk transfer a larger benefit size with respect to benchmark value compared to countries with higher risk.

Adequacy is highest for social pension programmes (42.09%), followed by unconditional cash transfer

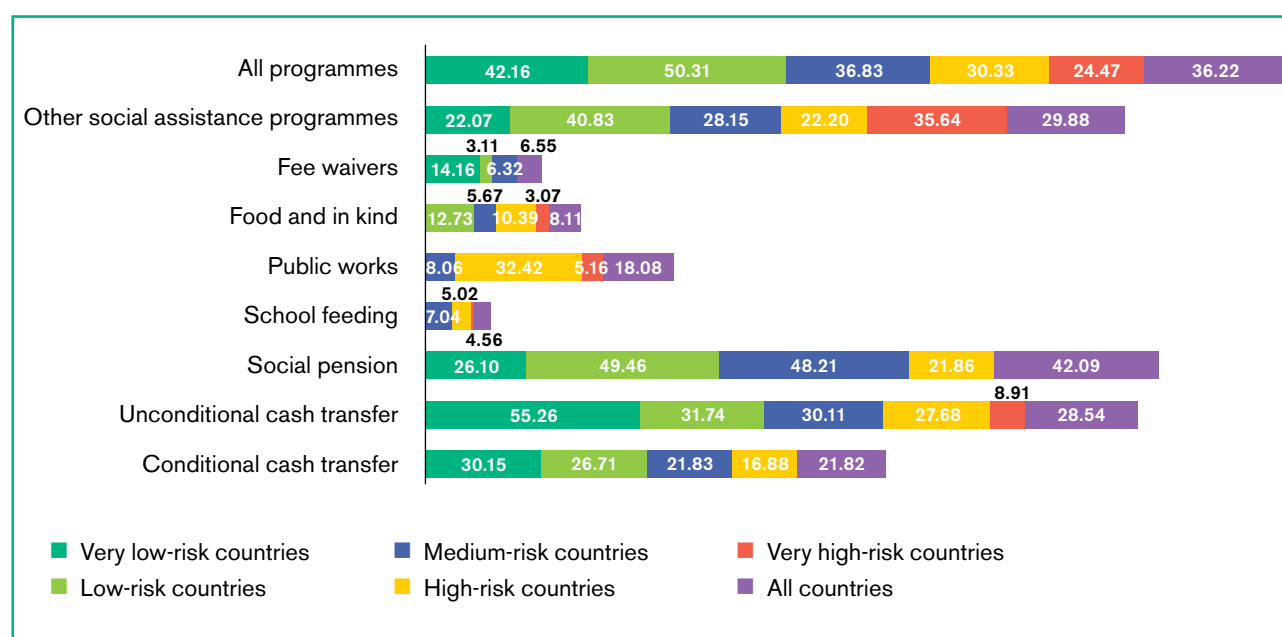
(28.54%) and conditional cash transfer (21.84%) programmes. The value for benefit adequacy among the poor is least for school feeding (4.56%), fee waivers (6.50%) and food and in-kind (8.11%) programmes. Interestingly, the instruments that have the highest benefit adequacy are most preferred in countries with lower risks. It should also be noted that countries with less risk have higher per capita income than countries with higher risks (Source: INFORM Risk Report, 2020). It could be inferred that these three instruments – namely social pensions, unconditional cash transfer and conditional cash transfer programmes – are likely to be more expensive than the other ones to produce the desired results, and countries with a higher income category are in a better position to adopt these instruments than countries from lower income category.

e. Average per capita transfer held by the extreme poor (<\$1.9 a day)

A comparative analysis on average transfers² makes it possible to understand the per capita value of programme funds allocated in different programme types within each risk category. It indicates how large the benefit size is in absolute terms.

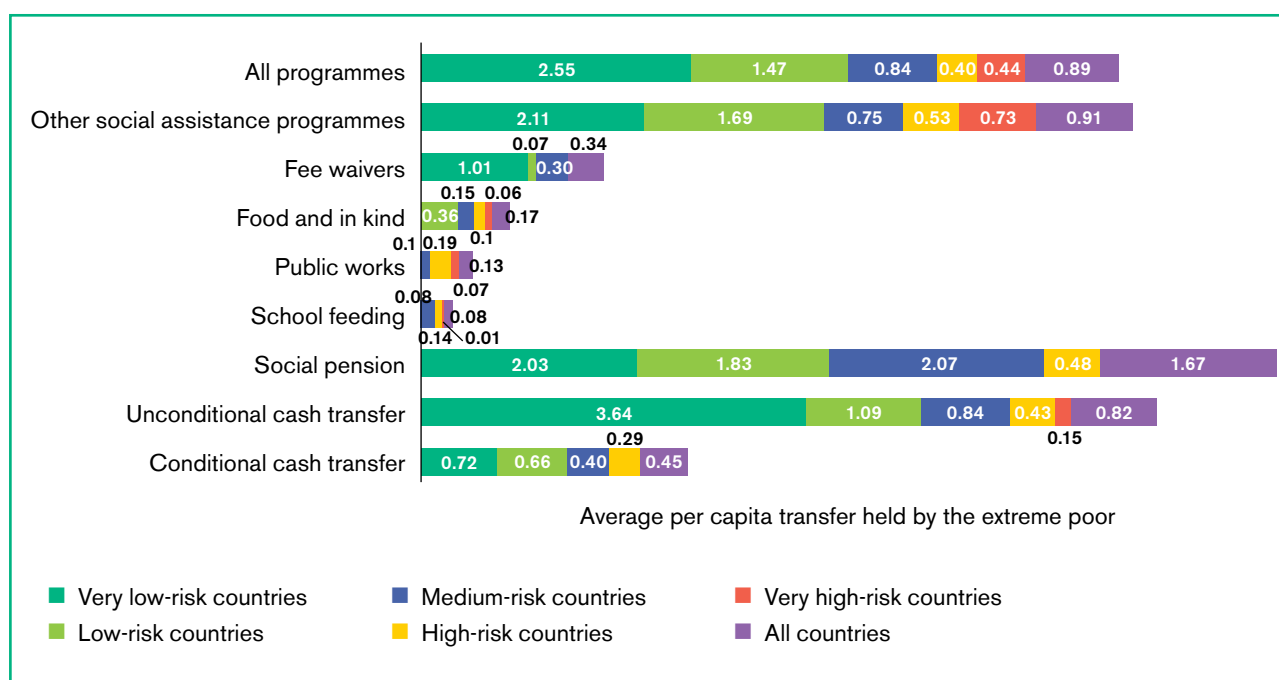
The values of average per capita transfer and the INFORM Risk Index are negatively associated, ie countries with lower risk transfer larger average benefits and vice versa. The average per capita transfer is the

Figure 8. Adequacy of benefits for the extreme poor (<\$1.9 a day) (%)



¹ Adequacy = (Amount of transfer/a bench mark value, eg average income or consumption) x 100.
² Average per capital transfer = (amount of transfer/total number of the extreme poor in the country)

Figure 9. Average per capita transfer held by extreme poor (<\$1.9 a day)



highest among the 'very low-risk' countries (\$2.55) and the lowest among the 'high-risk' countries (\$0.40).

Overall, the value of average per capita transfer, by taking all the programme instruments in all the risk categories into account, is \$0.89. The value is highest for social pension (\$1.67), followed by unconditional cash transfer (\$0.82) and conditional cash transfer (\$0.45) programmes. It is least for school feeding (\$0.08), public works (\$0.13) and food and in-kind (\$0.13) programmes. Results of average per capita transfers are similar to that of benefit adequacy, and it could be inferred that countries with higher incomes are more likely to afford social pension, unconditional cash transfer and conditional cash transfer than countries with lower incomes.

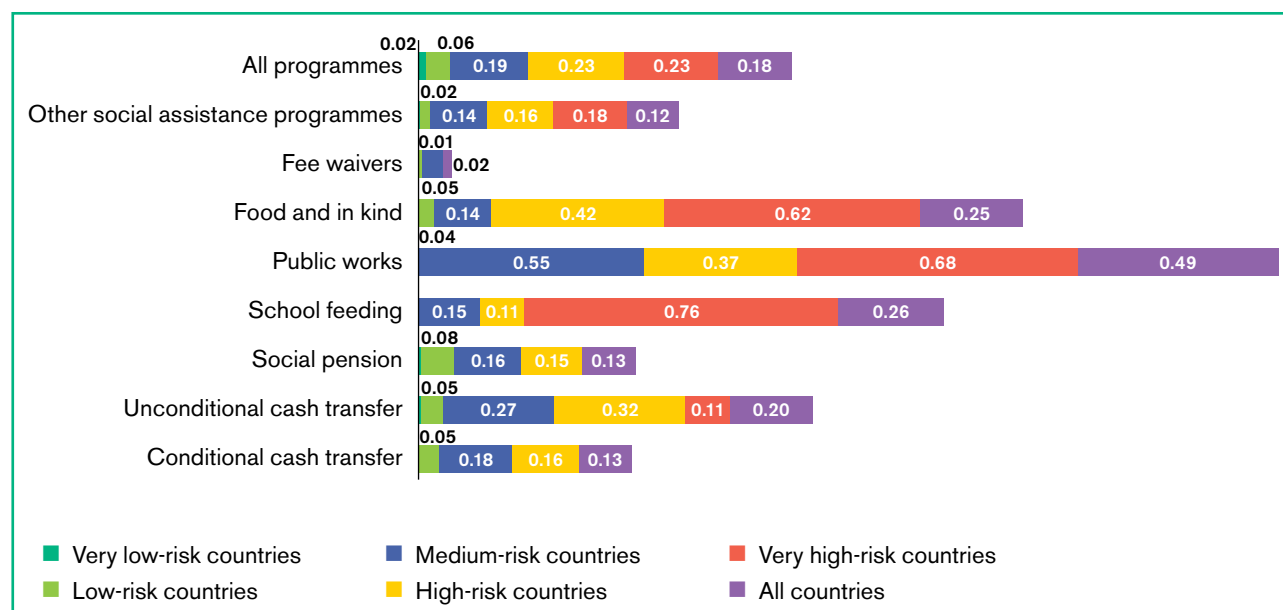
f. Benefit-cost ratio of social assistance programmes among the extreme poor (<\$1.9 a day)

The BCR indicates the reduction in the poverty gap obtained for each dollar spent on social assistance programmes. Specifically, the benefit-cost ratio is estimated as (poverty gap before transfer) minus (poverty gap after transfer) divided by total transfer amount. The higher the value, the better the cost effectiveness of the programme.

Overall, the benefit-cost ratio for all social assistance programmes is 0.18. The value is higher for countries with higher risk and vice versa. It is the highest for 'very high-risk' and 'high-risk' countries (0.23) and the lowest for 'very low-risk' countries (0.02). This means that very high-risk countries and high-risk countries, which have a higher proportion of poor among their population, are able to achieve a higher reduction in poverty for each dollar spent on social assistance programmes than medium-, low-risk and very low-risk countries.

The instruments which have the least benefit adequacy and average per capita transfer values have higher benefit-cost ratio values. For example, the public works programmes that have lower values of benefit adequacy (18.08%) and average per capita transfer (\$0.13) have a higher benefit-cost ratio (0.49). On the other hand, social pension programmes which have higher benefit adequacy (42.09%) and average per capita transfer (\$1.67) values have less benefit-cost value (0.13). This fact partly explains why countries facing high risk adopt instruments like food and in kind, school feeding, public works and fee waivers as they are able to address vulnerability with relatively less cost than instruments such as social pensions and cash transfers.

Figure 10. Ratio of the programmes



2.1.3 Summary of the efficacy analysis

A summary of the frequency analysis on the efficacy of different social assistance delivery mechanisms is presented in Figure 11. The highest values of efficacy parameters among the five risk categories are cross-tabulated by type of social assistance instruments.

The matrix identifies patterns in the performance of the instruments across the risk levels of the countries. The risk category of the countries is denoted by different colours. For example, coverage of the conditional cash transfer programmes is the highest in very low-risk countries (91.22% – denoted by dark green colour). The same value of public works programmes is the

Figure 11. Consolidation of efficacy parameters of different social assistance instruments

Social assistance instrument	Coverage	Benefit incidence	Benefit adequacy	Average per capita transfer	BCR
All instruments	77.47%	36.12%	50.31%	\$2.55	0.23
Conditional cash transfers	91.22%	24.91%	30.15%	\$0.72	0.18
Unconditional cash transfers	49.15%	48.91%	55.26%	\$3.64	0.32
Social pension	29.68%	28.76%	49.46%	\$2.03	0.16
School feeding	78.67%	38.01%	7.04%	\$0.14	0.76
Public works	19.02%	75.25%	32.42%	\$0.19	0.68
Food and in kind	89.32%	54.97%	12.73%	\$0.36	0.62
Fee waivers	41.96%	21.54%	14.16%	\$1.01	0.05

Figure inside the cell indicates the highest value among the risk categories

highest in high-risk countries (19.02% – denoted by orange colour).

Coverage, the ability of the programme to reach the deserving people from among the most vulnerable population in a country, is higher in countries with relatively lower risks (very low-risk and low-risk categories) for most of the programmes. Coverage performance is determined by factors such as better definition of the target population, better institutional capacity to accurately target the beneficiaries, and robust monitoring systems. The countries with lower risks have superior institutional capacities and hence are able to achieve higher target accuracies. Public works and fee waivers are the two exceptions, for which the countries with higher risks have the highest coverage value.

Benefit adequacy and average per capita transfers, which represent the 'size of the benefits' both display a common pattern. Other than public works, for all the instruments the value of benefit adequacy and average per capita transfer is the highest for countries with lower risks. Performance under these two parameters is primarily determined by the financial capacity of the countries. Hence, the countries with better financial resources perform well under these parameters.

Benefit incidence shows mixed results, however, countries with relatively higher risk do better than countries with lower risk. The indicator explains to what extent the non-poor are avoided by the programmes: the higher the exclusion of the non-poor the better the efficacy of the programme. Higher inclusion of non-poor in the programmes of lower-risk countries could be due to adoption of a policy of universal social assistance coverage. Public works programmes implemented in very high-risk countries record the highest benefit incidence value (75.25%) among all programmes. This indicates that public works programmes, by design, are highly capable of avoiding the inclusion of the non-poor.

BCR value is greater for countries with higher risks (very high-risk and high risk) than countries with lower risks. Despite better coverage and higher transfer amounts, the programmes of lower-risk countries have lower BCR values. School feeding, public works, and food and in-kind programmes implemented in the higher-risk countries have the greatest BCR value among all programmes. This indicates the programmes implemented in the higher-risk countries are more cost effective at producing intended results.

The comparative analysis shows the following distinct patterns:

1. For most of the social assistance instruments, countries with lower risks (eg Poland and Argentina) show a better performance than countries with higher risks on coverage, benefit analysis and average per capita transfer.
2. By contrast, analysis of BCR data illustrates a different pattern: The benefit-cost ratio for most of the social assistance instruments is higher for countries with higher risks (eg Chad, South Sudan, Ethiopia and India).
3. Public works programmes, distinct from other instruments, show a better performance in higher-risk countries (eg Chad, South Sudan, Ethiopia and India), in terms of coverage, benefit incidence, benefit adequacy, BCR and average per capita transfer.

2.2 Regression analysis

2.2.1 Model 1

This model is aimed at assessing the association between country-level vulnerabilities (represented by the vulnerability score y) and spending by the countries on their different social assistance instruments (x). The countries for which published data on the model variables was available were considered for the analysis. In the analysis of model 1, 122 countries were taken into account ($N=122$). The countries included in the survey are listed in Annex 1.

Regression analysis was undertaken to understand (i) how spending on different social assistance delivery mechanisms affects climate risk-related vulnerabilities and (ii) how efficacy of the social assistance delivery mechanisms affects climate risk-related vulnerabilities. Two linear regression models were developed to measure the association.

Table 3. Dependent and independent variables for regression model 1

Dependent variable	V = Vulnerability score (calculated from INFORM data)
Independent variables	CCT = Spending on conditional cash transfer programmes as % of the country's GDP UCT = Spending on unconditional cash transfer programmes as % of the country's GDP SP = Spending on social pension programmes as % of the country's GDP SF = Spending on school feeding programmes as % of the country's GDP PW = Spending on public works programmes as % of the country's GDP FOOD = Spending on food and in-kind programmes as % of the country's GDP FW = Spending on fee waiver programmes as % of the country's GDP OTHER = Spending on other social assistance programmes as % of the country's GDP GDP-PC = GDP per capita ('000s US\$)

The vulnerability score (V) used in the model is a composite value including the Human Development Index (HDI), the Multidimensional Poverty Index (MPI), the Gender Inequality Index (GII) and the Gini Index (GI). The higher the value, the lower the HDI, MPI, GII and GI within the country and vice versa.

Results of running regression model 1 are presented below

$$V = 6.579^{**} - 1.533 \text{ CCT}^* - 1.139 \text{ UCT}^{**} - 0.338 \text{ SP}^* + 0.970 \text{ SF} + 1.076 \text{ PW} + 0.255 \text{ FOOD} - 0.555 \text{ FW} + 0.284 \text{ OTHER} - 0.211 \text{ GDP-PC}^{**} + \varepsilon$$

** significant value at 1% level of significance

* significant value at 5% level of significance

For model 1, the **F value is 25.822 and is statistically significant** (sig.000). As a result, the model is fit. The independent variables in the model explain **more than 50% of the variation in the dependent variable (R²=0.675)**, which is good indicator of model fit. The intercept value is statistically significant.

Analysis of results shows that the regression coefficients of spending on conditional cash transfer (CCT), unconditional cash transfer (UCT) and social pension (SP) were statistically significant and these values were negative. It can be interpreted that countries that spend more on conditional remittances, unconditional remittances and social pensions are more likely to reduce vulnerabilities.

A similar result (negative relationship between x and y and statistical significance) exists between income status (GDP-PC) and vulnerability. The negative relation between GDP per capita and vulnerability score suggests that high-income countries are more likely to reduce their vulnerability and vice versa.

The GDP per capita has been included in the model to increase the 'effect size' ie the strength of the relationship between the independent and dependent variables. Spending on social assistance programmes is only a part of the efforts to address vulnerabilities at the country level, and there are several other factors that account for changes in vulnerability. GDP per capita is considered as a proxy to represent the variables other than social assistance programmes. GDP per capita is directly related to phenomena such as economic growth, financial capacity, administrative capacity, infrastructure and the nature of the economy. These phenomena are proved, by various researchers, to influence the efficacy and effectiveness of social assistance instruments.

The climate-related vulnerability is represented by a vulnerability score in this model. In the absence of a global-level metric to evaluate the effectiveness of social assistance programmes on vulnerabilities caused by climate change, the vulnerability score calculated using the data of the INFORM Report (2020) will be helpful to examine the relationship between the social assistance instruments and vulnerabilities. The score is a composite value of HDI, MPI, GII and GI. These indices represent the outcomes produced by a combination of several factors, and investment on social assistance is only a part of those factors. Hence, interpretation and generalisation of the results should be dealt with caution. However, the model results reveal how consistent the independent variables, particularly spending on social assistance programmes, are in explaining the variation in vulnerability (dependent variable).

2.2.2 Model 2

Model 2 analyses the relationship between the efficacy of social assistance programmes and the vulnerability score. The model considered vulnerability score as the dependent variable (y) and efficacy indicators (coverage, benefit incidence, average transfer and adequacy) and financial indicators (spending on social assistance programmes) as independent variables.

Regression analysis with the original model variables showed that the model was fit and F value was statistically significant, $R^2 = 0.554$. Intercept and coverage (COVER), benefit incidence (BI) and average (AVGPT) variables were statistically significant. However, the independent variables were observed to be correlated. Correlation between the independent variables may have affected the model due to multicollinearity; therefore exploratory factor analysis, a dimension reduction technique, was applied to produce independent variables which are uncorrelated among themselves. Detailed results of the factor analysis are given in Annex 2.

The exploratory factor analysis extracted two uncorrelated factors from among the four inter-correlated independent variables. In factor 1, variables, namely adequacy and average transfer, are highly loaded. Adequacy, in relative terms, and average per capita transfer, in absolute terms, explain the volume of the benefits. Hence factor 2 can be named as '**benefit size**'. In factor 2, variables, namely coverage and benefit incidence, are more highly loaded than the other two variables. Coverage and benefit incidence variables describe to what extent the social assistance programmes target the vulnerable populations. Hence, factor 1 can be named as '**target accuracy**'.

The new factor variables, target accuracy and benefit size, instead of the original four variables (coverage, benefit incidence, adequacy and average per capita transfer), were considered to run the model. The revised model 2 is presented in Table 4.

Table 4. Dependent and independent variables of revised model 2

Dependent variable	V=Vulnerability score (calculated from INFORM data)
Independent variables	BS = Benefit size (factor 1) of the social assistance programmes TA = Target accuracy (factor 2) of the social assistance programmes SSA = Spending on social assistance programmes as % of the country's GDP

For model 2 analysis, 66 countries (N=66), for which published data on the model variables was available, were considered for the analysis. Results of regression model 2 using the revised variables are as follows:

$$V = 5.427^{**} - 0.806 \text{ BS}^{**} - 0.977^{**} \text{ TA} - 0.150 \text{ SSA} + \varepsilon$$

** significant value at 1% level of significance

For model 2, the F value is 21.104 and is statistically significant (sig.000). Hence, the model is fit. The intercept value is statistically significant. R^2 value is greater than 0.5, which is a good indicator of model fitness.

The results indicate that benefit size and target accuracy were negatively related to the vulnerability score and were statistically significant. The result infers that an increased benefit size and target accuracy of the social assistance programmes have a higher prospect of reducing vulnerabilities in countries.

The result shows that social assistance programmes will be effective in reducing vulnerability in a country if exclusion and inclusion errors are minimised (ie better target accuracy) and benefit adequacy and average per capita transfers are increased (ie higher benefit size) while implementing the programmes.

In the frequency analysis, we observed that the values of the efficacy indicators (coverage, benefit incidence, benefit adequacy and average per capita transfer) were better for the countries with lower risks than for countries with higher risk. Results of model 2 confirm the findings of the frequency analysis.

While regression model 1 emphasised the significance of selecting appropriate instruments among the different options, model 2 highlights the importance of efficacy of the programmes to produce desired results.

Total spending on all welfare programmes is negatively linked to the dependent variable (vulnerability score) and the association is not statistically significant; hence, one need not give high weightage to this independent variable while predicting the y value.

Expenditures on all social assistance programmes were negatively associated with the vulnerability rating, but the association was not significant. It is interesting to note that, while the total spending on all social assistance programmes was not significantly associated with the vulnerability score, spending on specific instruments, namely conditional cash transfer, unconditional cash transfer and social pension (in model 1) were significantly related. This result leads to an understanding that, to reduce vulnerabilities, the selection of the type of the social assistance instrument is more important than merely increasing the spending on all the social assistance programmes without considering the instrument's effectiveness.

3

Qualitative analysis of the sample countries

3.1 Imperatives for qualitative analysis

The previous chapter analysed the effectiveness and efficacy of social assistance programmes in addressing climate-related vulnerabilities among communities. The generalisation of the quantitative analysis results need to be treated with caution, however. Instrument selection and programme design choices need to be determined by context rather than 'one-size-fits-all' approaches, with optimal design choices involving trade-offs. The best option will need to be assessed based on programme objectives, vulnerability and poverty characteristics, the availability of data and funds, institutional capacity and political acceptability (Arnold et al., 2011). This therefore necessitates a multidimensional analysis of social assistance programmes by applying a case research approach. This chapter encompasses a qualitative analysis of the research by considering information drawn from seven sample countries representing the five INFORM risk categories. The qualitative analysis attempts to find answers to the following questions:

- Why and how do certain social assistance instruments produce better results?
- Why do certain countries perform well while others struggle?

- What is the level of integration of climate change aspects into social assistance programmes?
- How effective are social assistance programmes in delivering preventive, protective, promotional and transformative functions in relation to climate resilience?

The list of selected countries is presented in Table 5.

Table 5. List of sample countries selected for qualitative analysis

SERIAL NUMBER	SAMPLE COUNTRY	INFORM RISK CATEGORY
1.	Poland	Very low risk
2.	Argentina	Low risk
3.	Ecuador	Medium risk
4.	India	High risk
5.	Ethiopia	High risk
6.	Chad*	Very high risk
7.	South Sudan*	Very high risk

The methodology followed for selection of the sample countries is given in Annex 3.

3.2 Social assistance programmes in sample countries

Countries implement a range of social assistance programmes. The present analysis only considers programmes for which adequate information on expenditure and efficacy indicators were available. A list of ten programmes included in the analysis is presented in Table 6.

The listed programmes are among the major social assistance interventions in the sample countries. The public works programme MGNREGS of India is the largest programme in terms of the number of beneficiaries served, followed by Pradhan Mantri Kisan Samman Yojana of India, *Asignación Universal por Hijo para la Protección Social* (CCT) of Argentina and *Family 500+* (UCT) of Poland. Countries experiencing lower risks (Poland and Argentina) spend substantially larger funds, particularly on cash transfer programmes, than countries with relatively higher risks. It is interesting to observe that while the public works programme of India has covered more than 100 million beneficiaries

Table 6. A brief description of the select social assistance programmes in the sample countries

PROGRAMME AND TYPE	COUNTRY AND RISK CATEGORY	OBJECTIVES	PROGRAMME FEATURES
Family 500+ (unconditional cash transfer)	Poland (very low risk)	<ul style="list-style-type: none"> Increasing the fertility rate Increasing the number of children in families Improving family welfare^a 	<ul style="list-style-type: none"> Families with children (under 18 years) receive monthly child-raising benefit Broad eligibility criteria allowing all families entitled for receiving benefits^b Coverage: 3,820,000 individual beneficiaries^b Programme spending: 1.48% of GDP^b
Health premium for caregivers (fee waivers)	Poland (very low risk)	<ul style="list-style-type: none"> Compensating income loss of the family caregivers^b 	<ul style="list-style-type: none"> A caregiver who is granted sick leave to care for the family members is provided allowance regardless of family income for a specified period Coverage: 188,650 people Programme spending: 0.06% of GDP^b
Asignación Universal por Hijo para la Protección Social (conditional cash transfer)	Argentina (low risk)	<ul style="list-style-type: none"> Reducing poverty among children and adolescents^b 	<ul style="list-style-type: none"> Families with children and adolescents living in poverty and vulnerable situations are provided with regular cash transfers Conditions related to health and education are included to promote desired behaviours Coverage: 3,969,777 people Programme spending: 1.53% of GDP
Bono de Desarrollo Humano (conditional cash transfer)	Ecuador (medium risk)	<ul style="list-style-type: none"> Guaranteeing food and nutritional security Reducing child malnutrition^c 	<ul style="list-style-type: none"> Cash benefits to the families with children under 18 Conditions related to school attendance and health check-ups Coverage: 1,640,434 people^b Programme spending: 0.26% of the GDP
Mahatma Gandhi National Rural Employment Guarantee Scheme (public works)	India (high risk)	<ul style="list-style-type: none"> Guaranteeing employment to rural families Improving durability and sustainability of rural infrastructure, strengthening rural institutions Skilling rural labour force^d 	<ul style="list-style-type: none"> All rural households are entitled to 100 days' guaranteed wage employment as unskilled labourers building different types of rural infrastructure such as irrigation tanks, canals, ponds, wells, roads etc^d One of the flagship programmes of the country Coverage: 142,800,000 individuals^e Programme spending: 0.25% of GDP^b

PROGRAMME AND TYPE	COUNTRY AND RISK CATEGORY	OBJECTIVES	PROGRAMME FEATURES
Pradhan Mantri Kisan Samman Yojana (unconditional cash transfer)	India (high risk)	<ul style="list-style-type: none"> • Augment the income of the farmer families • Protecting the farmers from falling in the clutches of moneylenders^b 	<ul style="list-style-type: none"> • Launched in February 2019 • ₹6,000 per year are transferred into the bank accounts of the farmers in 3 Instalments^b • Covers all farmers irrespective of size of landholding^b • Implemented online through direct benefit transfer^b • Coverage: 81,200,000 farming families^b • Programme spending: 0.23% of GDP^b
Productive Safety Net Programme (public works)	Ethiopia (high risk)	<ul style="list-style-type: none"> • Helping people in improving food security, asset possession and coping abilities^g 	<ul style="list-style-type: none"> • Programme transfers food, cash or both, based on need, through direct transfers or public work interventions • It also offers financial and technical support to families, based on custom-made business plans^g • Coverage: 7,997,218 people^b • Programme spending: 0.70% of GDP^b
Food aid to vulnerable/ food-insecure households (food and In-kind)	Chad (very high risk)	<ul style="list-style-type: none"> • Improving food security of vulnerable households 	<ul style="list-style-type: none"> • Programme distributes food items at regular intervals to families living in vulnerable conditions • Programme launched in 2016^b • Coverage: 422,457 individuals^b • Programme spending: 0.58% of GDP^b
Protection awaiting solutions of Sudanese refugees settled in eastern Chad (unconditional cash transfer)	Chad (very high risk)	<ul style="list-style-type: none"> • Improving food security of vulnerable households^h 	<ul style="list-style-type: none"> • Transfer of cash or vouchers in the programme. They offer beneficiaries the financial resources to maintain a minimum consumption level^h • Coverage: 308,862 people • Programme spending: 0.03% of GDP^b
Emergency Operation EMOP 200859 for IDPs and returnees (food and in-kind)	South Sudan (very high risk)	<ul style="list-style-type: none"> • Meeting emergency food and nutrition needs of the people in conflict affected areasⁱ 	<ul style="list-style-type: none"> • Programme is a response to safeguard food and nutrition requirements of the conflict-affected Greater Upper Nile Region and in protection of civilian sitesⁱ • Programme caters to food security needs of vulnerable children, pregnant women and lactating womenⁱ • Coverage: 2,208,005 individuals^b

Source: ^a (Sowa, 2016), ^b (ASPIRE database, 2017), ^c (Moncayo et al., 2019), ^d (Kaur et al., 2017), ^e (MGNRES website), ^f (MoAFW, 2020), ^g (Woolf et al., 2018), ^h (World Bank, 2016a) and ⁱ (Archibald, 2019).

by spending 0.25% of GDP (US\$50 per beneficiary), Ethiopia's public works programme (PSNP) covers nearly eight million people by spending 0.70% of GDP (US\$84 per beneficiary) and cash transfer interventions of Poland and Argentina serve around four million people by spending close to 1.5% of their GDP (US\$2,289 per beneficiary for Poland and US\$1,727 per beneficiary for Argentina respectively).

A review of the objectives and activities of social assistance programmes in sample countries reveals that the programmes aim at reducing economic poverty or/and improving food security, but none of the programmes explicitly focus on addressing climate change vulnerabilities. Interestingly, the public works programmes of Ethiopia and India have included interventions like restoring degraded lands, irrigation tanks, ponds, wells and canals, and improving skills of people to contribute to building climate resilience. However, such interventions need to be treated as unintended co-benefits of the programmes (Woolf, 2018) since the core focus of these programmes are employment guarantee and food security respectively. Similarly, some other programmes such as cash for work, food for work, payment for environmental services (eg REDD+) and so on have more direct connection with climate resilience (Györi et al., 2021).

Among the sample countries, coverage among the extreme poor is highest for the food and in-kind programme of India, followed by CCT programme of Argentina, CCT programme of Ecuador, UCT

programme of Poland and PW programme of India. The coverage is least for the UCT programme of South Sudan followed by Ethiopia's PW programme. It is intriguing to note that while India's PW programme serves more than 100 million people, it is able to cover only 31.68% of the extreme poor in the country, whilst Argentina's CCT programme covers 81.59% of the country's extreme poor in spite of serving only 3.97 million people. This explains the magnitude of poverty prevalence and vulnerability in India, a high-risk country, when compared to Argentina, a low-risk country. Similar association can also be observed between India's PW programme and the cash transfer programmes of Ecuador and Poland.

The information on coverage and benefit incidence show that all social assistance programmes are imperfect, to varied degrees, in terms of accurately targeting eligible households. All the programmes listed are observed to suffer from inclusion and exclusion errors. It can also be noticed that a positive association exists between the volume of funds spent on programmes and benefit adequacy and average per capita transfer. Benefit adequacy is around 50% for the cash transfer programmes of Ecuador, Poland and Argentina, while it is only 3.7% in case of the cash transfer programme of South Sudan. Benefit-cost ratio is higher for programmes of countries that experience higher risks (Ethiopia, India and South Sudan) than the other three relatively less risk-prone countries.

Table 7. Efficacy indicators for the social assistance programmes of the sample countries

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	PRO-GRAMME TYPE	COVER-AGE	BENEFIT INCIDENCE	BENEFIT ADEQUACY	AVERAGE PER CAPITA TRANSFER	BENEFIT COST RATIO
1.	Poland	Very low risk	UCT	38.54	28.52	55.26	3.64	0.03
2.	Poland	Very low risk	Fee waivers	10.69	21.54	14.16	1.01	Data not available
3.	Argentina	Low risk	CCT	81.59	10.97	48.42	1.12	0.06
4.	Ecuador	Medium risk	CCT	59.84	13.07	32.59	0.59	0.08
5.	Ecuador	Medium risk	SP	2.95	18.74	57.59	2.1	0.04
6.	India	High risk	PW	31.68	39.18	12.83	0.2	0.32
7.	Ethiopia	High risk	PW	9.62	91.62	16.08	0.19	0.58
8.	South Sudan	Very high risk	UCT	1.22	17.05	3.74	0.04	0.17

Note: CCT: conditional cash transfers, UCT: unconditional cash transfers, SP: social pensions, Food: food and in kind, PW: public works
Source: Extracted from ASPIRE database (2017)

3.3 Factors determining the performance of social assistance programmes

The qualitative analysis is guided by criteria suggested by Andrews et al. (2012) that comprise poverty and vulnerability trends, administrative capacity, financial capacity, and infrastructure. A schematic representation of factors that determine the efficacy and effectiveness of social assistance programmes is presented in Figure 12.

3.3.1 Poverty and vulnerability trends

Very high-risk and high-risk countries have a substantial proportion of the population that are poor, and these countries also have lower development indicators compared to medium-, low- and very low-risk countries (Table 8).

Among the five countries considered in the analysis, South Sudan, Ethiopia and India are considerably behind the other three countries (Poland, Argentina and Ecuador) in terms of HDI, MPI, GII and GI. While poverty and vulnerability levels have declined worldwide, the decrease has been much smaller in the developing countries (Andrews, et al., 2012).

Figure 12. Factors of implementing social assistance programmes. Source: adapted from Andrews et al. (2012)

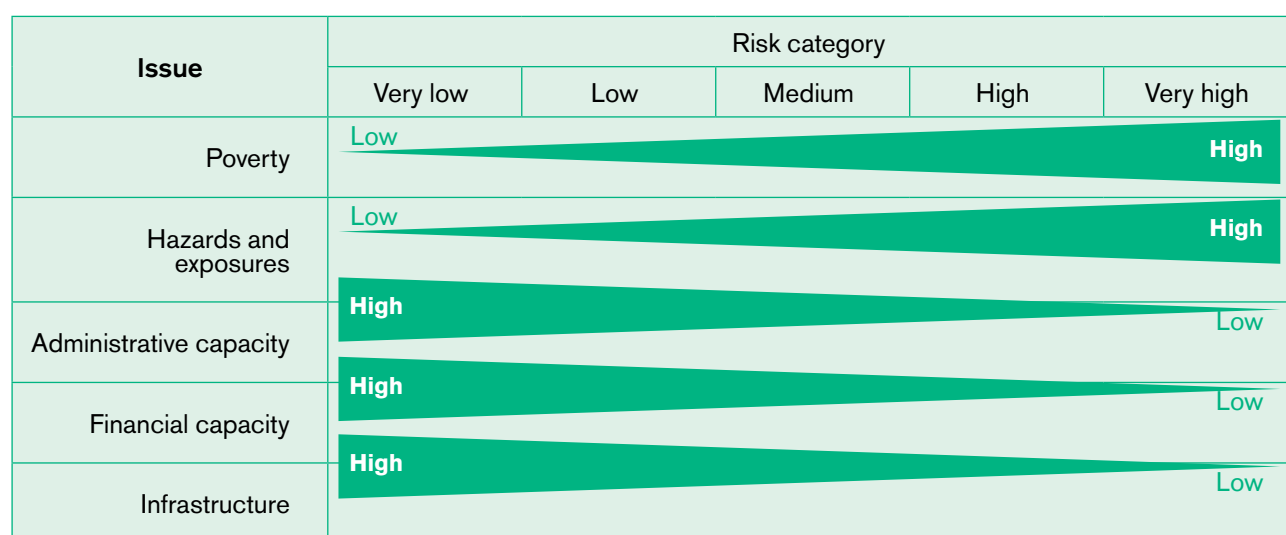


Table 8. Development and deprivation indices for the sample countries

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	HUMAN DEVELOPMENT INDEX (HDI)	MULTIDIMENSIONAL POVERTY INDEX (MPI)	GENDER INEQUALITY INDEX (GII)	GINI INDEX (GI)
1.	Poland	Very low	0.87	Not available	0.12	29.70
2.	Argentina	Low	0.83	Not available	0.35	41.40
3.	Ecuador	Medium	0.76	0.018	0.39	45.40
4.	India	High	0.65	0.123	0.50	37.80
5.	Ethiopia	High	0.47	0.489	0.51	35.00
6.	South Sudan	Very high	0.41	0.580	Data not available	46.30

Source: INFORM Report (2020)

Table 9. Hazard and exposure status of the sample countries

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	INFORM NATURAL HAZARD SCORE	INFORM HUMAN HAZARD SCORE
1.	Poland	Very low	2.3	0.1
2.	Argentina	Low	4.0	1.3
3.	Ecuador	Medium	6.9	1.3
4.	India	High	7.8	7.0
5.	Ethiopia	High	4.4	6.8
6.	South Sudan	Very high	4.0	8.0

Source: INFORM Report (2020)

The INFORM natural hazard score is a composite value of data on physical exposure to natural calamities such as earthquakes, floods, cyclones and tsunamis, and health hazards such as malaria, dengue, Lassa fever, Zika virus and so on. The INFORM human hazard score constitutes indicators related to violent conflict probability, national power conflict intensity and subnational conflict intensity. Values of both the scores range from 1 to 10, with higher values denoting higher physical exposure to hazards. The hazard score values for Poland and Argentina are less than other countries, indicating that the level of exposure to natural and manmade hazards is small.

Vulnerability is dynamic in less-developed countries and a small negative shock has the potential to drag a large number of families back into poverty (Beegle et al., 2018). High exposure to hazards and the prevalence of poverty in a country suggests a potentially large target population for social assistance programmes and demands a significant increase in the programme budget (Schubert, 2005). On the other hand, governments are constrained by limited financial and administrative capacities, and a trade-off should be arrived at in selecting the instrument and enhancing programme efficacy (Andrews et al., 2012). As a result, countries with higher vulnerability

and poverty incidences generally end up making suboptimal choices.

The results of the quantitative analysis showed that public works, food and in-kind, school feeding and fee waivers, which have less benefit adequacy and average per capita transfer values than the other instruments, are predominantly adopted by countries in very high-risk and high-risk categories.

3.3.2 Administrative capacity

Poor administrative capabilities make it difficult for governments to coordinate activities and effectively respond to the demands for social assistance. Countries with lower literacy levels like South Sudan and Chad have a small pool of professional human resources to administer the social assistance programmes, and the programmes are largely understaffed (Andrews et al., 2012). The professionals in these countries lack skills for integrating activities like needs assessment, programme design, monitoring and evaluation, and policy formulation into social assistance. As a result, the social assistance programmes are under-resourced and the programme implementation capacity is problematic at all levels of government (Coady, 2003)

Table 10. Administrative capacity indicators for the sample countries

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	GOVERNMENT EFFECTIVENESS INDEX
1.	Poland	Very low	0.66
2.	Argentina	Low	0.03
3.	Ecuador	Medium	-0.26
4.	India	High	0.28
5.	Ethiopia	High	-0.61
6.	South Sudan	Very high	-2.45

Source: INFORM Report (2020)

The World Bank Group, as part of its endeavours to measure the quality of public services, policy formulation and implementation, and credibility of government, has developed the government effectiveness index. Countries are ranked from -2.5 (less effective) to 2.5 (more effective) (Guisan, 2009). Table 10 shows that countries with high risk also have a poor government effectiveness index. While Poland has an index value of 0.66, South Sudan has -2.45. Since independence, South Sudan has suffered uncertainty, political disorder and sporadic armed agitations. These factors, coupled with corruption, weak human capital, inadequate physical infrastructure and poor administrative systems have resulted in a fractured society that leaves a large portion of the population underdeveloped and vulnerable (African Development Bank Group, 2014).

When there are limited capacities to coordinate programmes with complex requirements, policymakers tend either to select programmes with simpler design elements that are in line with the existing administrative capacity, or use the available system to run new programmes rather than create new systems (Smith, 2003). Instruments like conditional cash transfers, social pensions and so on require substantial managerial capacity to coordinate information on programme enrolment, compliance and payment. If these conditions are unfulfilled, the programmes will most probably be ineffective in achieving their purpose. This indicates that, in spite of the success of cash transfer and social pension programmes in countries with low risks, it is not certain if success can be replicated in countries with relatively high risks (Arnold et al., 2011).

The likelihood of social assistance programmes performing poorly, with low target accuracy and benefit size, is quite high in countries with poor institutional

capacities. The comparative analysis of efficacy in the present research shows that coverage, benefit adequacy and average per capita transfer of social assistance programmes are lower for very high-risk and high-risk countries than for countries with relatively less risk (refer Table 7 of section 3.2).

3.3.3 Financial capacity

Sustained financing for social assistance programmes is a serious concern in countries with low-income profiles. Low levels of revenue generation from the economy makes it difficult for these countries to absorb the minimum affordable levels of per capita spending (Andrews et al., 2012).

Vulnerability expressed as INFORM Risk Index and GDP per capita are highly correlated (Pearson's correlation coefficient $p = -0.71$; $sig = 0.000$). This indicates that there is a high likelihood of high-income countries having less vulnerability and vice versa. Among the sample countries being considered for the case analysis, Poland (very low risk) is a high-income country, Argentina (low risk) and Ecuador (medium risk) are upper-middle-income countries, India (high risk) is a lower-middle-income country and South Sudan (very high risk) is a low-income country.

The INFORM Economic Dependency Index (EDI) is a composite indicator of public aid per capita, net Official development assistance (ODA) received expressed as a percentage of gross national income, and volume of remittances. The index ranges from 1 to 10. The higher the value of the index, the higher the economic dependency of the country on external sources to fund developmental activities. Among the five countries, South Sudan has the highest EDI value (7.7). A country with a lower EDI value has more potential of funding

Table 11. Financial capacity indicators for the sample countries

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	GDP PER CAPITA (US \$)	INFORM ECONOMIC DEPENDENCY INDEX (EDI)
1.	Poland	Very low	15,595	0.2
2.	Argentina	Low	10,006	0.0
3.	Ecuador	Medium	6,184	0.6
4.	India	High	2,104	0.4
5.	Ethiopia	High	858	1.8
6.	Chad	Very high	710	3.5

Source: INFORM Report (2020)

Table 12. Intensity of poverty and spending on social assistance in sample countries

SERIAL NUMBER	COUNTRY	POPULATION (2019) ¹	POVERTY HEAD COUNT RATIO @ \$1.90 PER DAY (2011 PPP) (% OF POPULATION) ²	GDP PER CAPITA (US\$) ¹	SPENDING ON SOCIAL ASSISTANCE AS % OF GDP ³
1.	Poland	37,887,771	0.2 (2018)	15,595	1.97
2.	Argentina	44,780,675	1.9 (2019)	10,006	1.84
3.	Ecuador	17,373,657	3.6 (2019)	6,184	1.50
4.	India	1,366,417,756	22.5 (2011)	2,104	1.50
5.	Ethiopia	112,078,727	30.8 (2015)	858	1.02
6.	Chad	15,946,882	38.1 (2011)	710	0.75

Source: ¹ INFORM Report (2020), ² World Bank Poverty Data, ³ ASPIRE Database (2020)

its social assistance programmes from internal tax revenues and is more likely to promote sustainable social assistance systems. Low levels of revenue generation from internal sources within a small economy makes it difficult for countries like South Sudan to handle optimal levels of per capita spending on social assistance. Therefore, a substantial proportion of the spending on social assistance in these countries is generally financed by ODA (Andrews et al., 2012).

The spending analysis in the present study shows that countries with low risks spend 1–2% of GDP on social transfers. However, this magnitude of financial commitment in relation to the size of the economy masks a substantial variation in the actual level and effectiveness of the spending. Generally, in high-income countries (like Poland and Argentina), revenue generation is substantially high while the extent and intensity of vulnerability are relatively low. For such countries, even 2% of GDP is sufficient to fund national cash transfer programmes that reach 25% or more of the vulnerable population with proven effect. In contrast, countries like Ethiopia, India and South Sudan, that have relatively high incidences of poverty and vulnerability, and low revenue generation, struggle to mobilise funds to finance social assistance from their small revenue base. Models suggest that the countries with a low revenue base will have to spend an impracticable large volume of funds (2–6 % of GDP) to achieve the desired minimum transfer provisions (Sumner, 2010).

It may not be financially viable for low-income countries to use instruments such as conditional cash transfer, unconditional cash transfer and social pensions that require higher average per capita transfer to achieve the desired outcomes. Their low income base coupled with high incidence of poverty, predominantly informal nature of their economies and difficulties in drawing sufficient valid information makes these instruments economically unviable for low-income countries. At the same time, there may be a scope for limited, highly targeted cash transfer programmes for populations with a high prevalence of vulnerability (Smith, 2003). While making decisions on the selection of social assistance instruments, countries have to strike a balance between the affordability of the instrument and social assistance goals to be achieved.

BOX 4. SIMULATIONS FOR APPLICATION OF UNCONDITIONAL CASH TRANSFER PROGRAMMES ACROSS RISK CATEGORIES

Assuming that a policymaker plans to increase spending on UCT instruments and considers that it reduces vulnerability more effectively than other instruments, regression model 1 can help the policymaker understand how much spending on UCT will be needed to attain a target level of reduced vulnerability in the country. For this simulation, Poland's vulnerability score of 1.39 is fixed as a desired state of vulnerability. The results are presented as follows:

SERIAL NUMBER	COUNTRY	ORIGINAL SPENDING ON UCT AS % OF GDP	ACTUAL VULNERABILITY SCORE ^a	ESTIMATED VULNERABILITY SCORE ^b	ADJUSTED SPENDING ON UCT AS % OF GDP ^c	DESIRED VULNERABILITY SCORE ^d
1.	Poland	1.48	1	1.39	1.00	1.39
2.	Argentina	0.02	2.9	1.92	0.45	1.42
3.	Ecuador	0.23	4.5	4.14	2.60	1.44
4.	India	0.00	5.8	5.47	3.50	1.37
5.	Chad	0.03	8.5	6.14	4.20	1.40

Source: Calculated from the results of regression model 1

^a Actual vulnerability score for the country calculated directly from INFORM Report (2020)

^b Vulnerability score estimated for the country by running the regression equation

^c Assumed value of spending on UCT programmes to be applied in the regression equation for producing a desired voluntary score

^d Vulnerability score calculated by applying the adjusted spending on UCT programmes in the regression equation

Chad is a low-income country with a GDP per capita of US \$710. It is grouped under the high-risk category with an INFORM Risk Index of 7.3 and voluntary score of 8.5. Suppose the country's policymakers plan to reduce the vulnerability score to 1.40 by increasing the spending on UCT, keeping the spending on other social assistance programmes constant. The country will need to increase the spending on UCT by 4.2% of GDP to attain the desired vulnerability score of 1.40.

The policymakers need to consider the financial implications when planning a shift to cash transfer programmes. It may not be feasible to increase the spending on UCT programmes alone to 4.20% for a low-income country like Chad.

3.3.4 Infrastructure

Infrastructure is less developed in high-risk and very high-risk countries when compared to infrastructure in very low-, low- and medium-risk countries. Weak infrastructure facilities make universal coverage of social assistance programmes difficult, and accurate targeting a challenge (Andrews et al., 2012).

The majority of the population in countries like South Sudan, Ethiopia and Chad live in rural areas (80.38%, 79.34% and 65.97% respectively as of 2018; source: INFORM Report, 2020), with restricted access to road infrastructure, telecommunication facilities, internet usage, water and electricity. Social assistance programmes therefore meet considerable logistical problems in reaching their target communities.

The application of electronic delivery mechanisms which establish a unique identifier and make the transfers directly to the recipients, has been proven to reduce leakages and enhance cost effectiveness in social assistance programmes. The experience of Latin American and European countries recommends the upgrading of delivery mechanisms as one of the crucial prerequisites for the successful implementation of programmes like cash transfers (Arnold et al., 2011). Against this backdrop, selection of cash transfer programmes in countries with poor telecommunication and internet infrastructure will not be operationally viable.

Table 13. Infrastructure indicators for the sample countries

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	ROAD DENSITY	ACCESS TO ELECTRICITY (%)	INTERNET USERS (%)	MOBILE CELLULAR USERS (PER 100 PEOPLE)
1.	Poland	Very low	200.6	100.0	74.66	115.6
2.	Argentina	Low	19.0	100.0	74.29	132.1
3.	Ecuador	Medium	25.0	100.0	57.27	92.3
4.	India	High	24.6	95.20	34.45	86.9
5.	Ethiopia	High	8.4	45.00	18.62	37.2
6.	South Sudan	Very high	6.1	28.20	7.98	33.5

Source: INFORM Report (2020)

3.4 Risk responsiveness of social assistance programmes

Social assistance and climate change adaptation programmes both intend to promote resilience among vulnerable communities by strengthening coping and adaptation capacities to climate risks. While social assistance policies and programmes have grown from humanitarian aid strategies for supporting people affected by shocks, climate change policies envisage building the capabilities of vulnerable communities to plan and manage against climate risks (Steinbach, 2016). Social assistance interventions are not likely to be successful unless they also integrate climate change adaptation elements into their programme design. Social assistance programmes that generally emphasise improving short-term coping capacities also have to consider promoting the long-term adaptive capacities of vulnerable communities (Davies et al., 2008).

3.4.1 Social assistance's effectiveness in reducing climate-related vulnerabilities

Social assistance, traditionally, has emphasised enhancing economic growth by strengthening human, social and economic capital. Yet advocates of the resilience agenda argue that social assistance has the transformative potential to help redress the structural inequalities that are embedded in sociopolitical contexts and lie at the root of poverty. They also argue that social assistance can potentially address the long-term vulnerability issues caused by climate change (Devereux et al., 2016).

Davies et al. (2008) argue that root causes of poverty and vulnerability cannot be effectively addressed by climate change adaptation if a differentiated view of poverty and vulnerability are taken. They insist that social assistance/protection interventions should be planned for longer timeframes to produce desired results. Devereux and Sabates-Wheeler (2004) recommended a '3P+T' approach for social protection/assistance to enhance climate change adaptation interventions:

- *Provision*: protection of those most vulnerable to climate risks who have low levels of adaptive capacity
- *Prevention*: prevent damaging coping strategies as a result of risks to weather-dependent livelihoods
- *Promotion*: promote resilience through livelihood diversification and security in order to withstand climate-related shocks. Promote opportunities arising from climate change
- *Transformation*: transform social relations to help address underlying causes.

Tenzing (2020) applies a framework based on resilience thinking that was introduced by Béné et al. (2012), and that combines the '3P+T' approach to analyse the transformational potential of social assistance in the context of climate change. The framework consists of three dimensions, namely absorptive capacity, adaptive capacity and transformative capacity. Absorptive capacity is about facilitating short-term coping abilities to buffer shocks. Adaptive capacity is related to enabling incremental modifications which do not necessitate major changes in a systems structure or its functions. Transformative capacity is about building more substantive system-level change to ensure long-term sustainability (Béné et al., 2012).

Research confirms that social assistance programmes help households to cope with climate-related stresses, which is a prerequisite but not a sufficient condition to build adaptive capacity among the vulnerable communities (Tenzing, 2020). At the most fundamental level, social assistance programmes help the poor face acute and short-term needs, and access additional resources when climate-related shocks occur (Ulrichs et al., 2019).

An evaluation of unconditional emergency cash transfers in the Kanem region of Chad in 2014 found that the project met 50% of the food needs of the sample households. It had little impact on poverty reduction or the local economy, because the transfer value was very low. Similarly, an evaluation of Oxfam's cash transfer programmes in the Guera, Bahr el Gazal and Sila regions of the country, between 2012 and 2014, found that cash transfers had positive impacts on household food security and allowed beneficiaries to avoid negative coping strategies such as destocking and indebtedness. The small transfers covered only survival needs however, and some authorities were concerned that free cash transfers undermined resilience and promoted 'dependency syndrome' among beneficiaries (Devereux and Watson, 2016).

A study conducted by Kaur et al. (2017) in Jharkhand, India, by applying the resilience framework, concluded that while 25% of the programme beneficiaries built absorptive resilience, only 12% and 2% beneficiaries built adaptive and transformative resilience respectively. The study also found that 50% of the sample households reported a decline in resilience during the latest drought event, despite taking part in the public works programme. The households that experienced decline in resilience also reported that there was no change in farm production, irrigation facilities or availability of land for crop diversity. This indicates that the public works programme with a social assistance orientation had limited ability in influencing livelihoods outcomes and enhancing drought resilience. Changes to the programme design, by strengthening adaptation components, will help achieve better resilience outcomes.

The conditional cash transfer programme of Ecuador contributed to a reduction of mortality due to factors related to poverty – such as malnutrition and respiratory infections. For each 1% increase in coverage of the programme, there would be a 3% decrease in the mortality rates of under-fives due to malnutrition. The programme also reduced hospitalisation rates among under-fives overall and due to diarrhoea (Moncayo et al., 2019).

Brzeziński and Najsztub (2017) concluded that the cash transfer programme of Poland increased the household income of the beneficiaries to the largest degree, and reduced income inequality measured by the Gini Index. Brzeziński et al. also cautioned that the short-term progressive impact of Poland's cash transfer programme on income distribution may be limited in the long term (Brzeziński and Najsztub, 2017).

Resilience outcomes of Argentina's cash transfer programme, as evaluated by UNICEF (2019), were largely absorptive and to some extent adaptive in nature. The programme was effective in reducing inequality in terms of access to income among children and adolescents. It was extremely effective in introducing equity at the start of an individual's life. The cash transfer beneficiary households had a higher likelihood of being economically active and they possessed better capabilities for choosing suitable employment during job searches. Child labour was practically nil among the programme beneficiaries, and the programme also demonstrated a reduction in an adolescent's propensity for early entry into labour market. The programme substantially increased access to medical check-up facilities and improved the nutritional status of children and adolescents (UNICEF, 2019).

Györi et al. (2021), in their research work, have shown that social assistance can potentially contribute to climate change mitigation and the establishment of climate-neutral economies. They present that social assistance can help enhance the acceptance and effectiveness of climate change mitigation interventions. Whilst on the one hand social assistance can play a key role in protecting poor and vulnerable populations from the adverse impacts of climate change mitigation policies – such as rising energy prices due to subsidy reforms, or job losses related to green structural change – on the other hand social assistance can also actively incentivise climate-friendly behaviour.

These studies do not necessarily reject the idea that social assistance contributes to adaptation; rather, they suggest that current systems, or certain instruments, are not yet fit to deal with new challenges associated with climate change. The instruments in particular need to go beyond supporting short-term coping strategies and, in the case of insurance, need to ensure that inequalities are not exacerbated as a result of uneven access. In fact, the research that finds a positive role for social assistance in supporting adaptation also points to its limitations: social assistance is not a panacea, it only forms a part of the adaptation toolkit.

3.4.2 Integration of climate resilience in the design of the social assistance

Adequacy of funding and an integrated approach are the two pivotal factors that help social assistance programmes promote resilience against climate change and other risks and shocks. Although many countries have comprehensive social assistance and climate change policies, in most cases the two are not integrated: both remain separate, administered by different departments without coordination between

them and usually funded by different channels. This seriously limits the attainment of synergies for more sustainable efforts to reduce vulnerabilities (Steinbach, 2016).

A review of the design features of the social assistance programmes implemented in the five sample countries shows that the climate-informed planning and implementation are not a part of their programme design; the Chad Safety Nets Project of Chad being an exception.

BOX 5. INSTITUTIONAL COORDINATION: EXPERIENCE OF LATIN AMERICAN COUNTRIES

The social protection/assistance systems of Latin American countries have effective integration of different levels of governance for addressing heterogeneous demands of social assistance. In addition to a wide range of agencies engaged directly in social assistance administration and regulation, the Latin American countries have created a number of bodies and mechanisms for social policy coordination, technical-level integration and harmonised action among different departments at the grassroots level. These mechanisms and structures are linked in various ways with an objective of enhancing the quality of social assistance delivery to their citizens.

Some of Latin America's best practices for institutional monitoring include social cabinets and coordinating ministries for social issues; these being identified as alternative means for performing the functions of a social authority. Examples are Uruguay's Social Cabinet, Paraguay's Social Cabinet, Colombia's National Council on Economic and Social Planning, and Brazil's sectoral chambers drawing together groups of ministers.

The Chile Solidarity system of coordination at the technical level has an executive secretariat under the Ministry of Planning and Cooperation. This body is responsible for: coordinating the institutions responsible for providing welfare benefits and ensuring networking among them; generating resources targeted at needs not covered by regular provision (expanding existing social programmes and creating new ones); and overseeing information management while maintaining an integrated support system. It operates on the basis of direct inter-agency agreements, within a legal framework that governs the operation of the entire system.

At the operational level too there have been useful experiences of coordination arising from the use of service management instruments, such as the "one-stop shop" for centralising a range of administrative formalities and providing information and access to various local social services via a single public service office or desk (or for 'family support', in the case of Chile Solidarity).

Source: Cecchin and Martinez (2012)

BOX 6. PUBLIC WORKS PROGRAMME OF ETHIOPIA IMPROVES CLIMATE RESILIENCE

Ethiopia's Productive Safety Net Programme (PSNP) demonstrates how a focus on restoring degraded lands can improve climate resilience. Started in 2005 with a major focus of improving food security, the PSNP incorporated land development considerations, prioritising resilience. Today the PSNP is one of the largest public works programmes in Africa, covering 7.8 million beneficiaries. The Government of Ethiopia has partnered with the European Union, World Bank, DFID, Irish Aid, UNICEF and Department of Foreign Affairs and Trade, Canada in the endeavour. The PSNP aims to increase resilience against shocks and improve food security through sustainable natural resource management, public works, cash transfers and nutritional feeding. According to the evaluations, the programme has improved community resilience by increasing land productivity by three or four times. Higher productivity has been achieved by reducing soil erosion and sediment losses. Improved food security has resulted in a reduction in the distress sale of assets during emergencies and the drop out of children from schools. The programme interventions achieved a reduction of greenhouse gas emissions from land-use sub-sectors and sequestering of carbon dioxide in soils and biomass.

Source: European Union (2020),

In this context, the current COVID-19 pandemic has offered immense learning to policymakers on how to design and apply social assistance instruments to address growing future risks and vulnerabilities. The pandemic has left people far more vulnerable to other shocks like droughts, floods, food insecurity, unemployment, health insecurity and so on. Families are more financially insecure and health systems are under severe strain. A lack of capacity to absorb and respond to shocks, at all levels of society, has been exposed by COVID-19 (Disaster and Risk Financing and Insurance Program, 2020).

The pandemic has given significant visibility to the role of social assistance, but has also highlighted the significant gaps in coverage and adequacy. The world has recognised that social assistance has a central role to play in addressing social, economic and health aspects of both the current and future crises. Social

assistance has been applied worldwide as one of the key tools to address vulnerability issues caused by the pandemic. In many cases, the responses have – for the first time – represented something of a ‘whole system social assistance response’. (ILO, 2020).

Countries have either introduced or modified social transfer programmes in response to COVID-19. The social assistance interventions have been either vertical-increasing of the benefit levels or horizontal-expanding of the coverage. The nature of support provided includes cash or in-kind payments, as well as waivers, postponements or subsidies to social security contributions, tax payments, utility bills, rents and mortgages. The majority of programmes introduced worldwide are cash transfers and food (Gentilini et al., 2020). The range of interventions undertaken in the sample countries as part of the COVID-19 response are presented in Table 14.

Table 14. Social assistance interventions in response to COVID-19 in the sample countries

SERIAL NUMBER	COUNTRY	FINANCIAL ALLOCATION FOR SOCIAL ASSISTANCE (% OF GDP)	SOCIAL ASSISTANCE TOOLS APPLIED	SPECIFIC INTERVENTIONS
1.	Poland	8.7	<ul style="list-style-type: none"> • Cash transfer • Food aid • Fee waivers 	<ul style="list-style-type: none"> • Wage subsidies for the affected • Postponement/cancellation of social insurance contributions • Allowance for parents of the children • Interest rate subsidies
2.	Argentina	6	<ul style="list-style-type: none"> • Cash transfer • Fee waivers 	<ul style="list-style-type: none"> • Increased cash transfers to poor families • Grants to cover payroll costs • Subsidised loans for construction activities • Reduced social security contributions • Spending on public works
3.	Ecuador	1.7	<ul style="list-style-type: none"> • Cash transfer • Food aid 	<ul style="list-style-type: none"> • New cash transfer for informal workers • Food distribution • Additional health funding
4.	India	1.6	<ul style="list-style-type: none"> • Social pension • Food aid • Public works • Fee waivers 	<ul style="list-style-type: none"> • Increased wages in the public works programme • Increased the budget for the public works programme from US\$8 billion to US\$14 billion • Free food and cooking gas distribution • Social pensions to elderly and women
5.	Ethiopia	1.6	<ul style="list-style-type: none"> • Food aid • Cash transfer • Public works 	<ul style="list-style-type: none"> • Food distribution to people with food insecurity • Emergency shelter provision • Agricultural sector support
6.	Chad	0.5	<ul style="list-style-type: none"> • Fee waivers • Food aid 	<ul style="list-style-type: none"> • Suspending electricity bill payment • Replenishing national food distribution programme
7.	South Sudan	0.7	<ul style="list-style-type: none"> • Cash transfer 	<ul style="list-style-type: none"> • Increasing coverage of cash transfer programme

Source: Gentilini et al. (2020) and IMF (2021)

Countries like Poland and Argentina, with higher revenues, were better prepared and acted swiftly and fared better in comparison to other countries in their COVID-19 response. They were able to allocate more than 6% of their GDP for non-contributory social assistance programmes, while countries like India and Ethiopia allocated just above 1.5% of GDP. These countries (Poland and Argentina) were already equipped with financial shock absorbers, such as contingency budgets and contingent credit and have been able to protect their economies. Low-income countries like Chad, South Sudan and so on had limited fiscal capacity before the crisis, and which is now being further eroded by factors like lower tax revenues, higher debt servicing costs, and falling export earnings, remittances and foreign investment (Vaziralli, 2020). Even India, which has the one of the largest number of people affected by COVID-19 in the world, has only committed around 1% of its GDP to its COVID-19 relief fund. In comparison, governments in the UK, Spain, Germany and the US have offered stimulus plans worth more than 20% of GDP (Krishnan, 2020).

The ongoing response to COVID-19 provides an opportunity to begin building towards more comprehensive and shock-responsive social assistance systems. Scaling up the ongoing social assistance response requires allocation of appropriate financial resources (ILO, 2020). Looking ahead to the recovery phase, there is an urgent need to embed stronger preparedness and resilience into policy, investment and development finance.

The social assistance sector provides important lessons for managing future risks. Three key lessons learned from embedding disaster risk financing in social assistance programmes (Disaster and Risk Financing and Insurance Program, 2020) are: understanding the risk and potential cost before the disaster; planning the financing to ensure a timely response; and putting effective delivery mechanisms in place. Now is the time to integrate resilience firmly into risk response plans. This will not only enhance resilience among poor communities but also improve the effectiveness of development programmes.

BOX 7. THE EFFECT OF EARLY AND PROACTIVE SOCIAL ASSISTANCE RESPONSES

The 'Economics of Early Response and Resilience' conducted studies in Ethiopia, Kenya and Somalia in 2013 and 2018. The studies estimated the relative cost of late social assistance response, and compared this with an early social assistance response and resilience building resilience-building response. The studies concluded that early interventions can enable a family not to fall back into the poverty trap. A social assistance intervention that offers early and predictable transfers can lessen this decline even further and keep the family away from losses. A pro-active approach that combines cash transfers and resilience-building activities can avoid a substantial volume of losses to the family. The study estimated that a donor can save 30% on humanitarian aid spending if responses are made early and pro-actively, which is equivalent to savings of US\$1.6 billion when applied to spending by the American Government between 2013 and 2018 in these three countries. Every US dollar investment in resilience building among the people will result in the reduction in the amount of US dollars spent on humanitarian aid.

Source: Venton, 2020

4

Social assistance and climate resilience: lessons for India

This chapter examines the feasibility of introducing a universal basic income (UBI) scheme in India through a climate resilience lens.

4.1 Social assistance programmes of India: a legacy of inefficient implementation and administrative leakages

India has a long history of implementing social assistance programmes and in all, there are more than 950 such programmes funded by the Indian government. Most of these programmes are small, fragmented and plagued by administrative leakages (Ministry of Finance, 2017). They are also typically characterised as fraught with inefficiencies and inequities. Numerous studies have documented their incomplete coverage of the poor, the extensive leakage of benefits to the rich, significant operational inefficiencies, and high potential for fraud and corruption (Coady and Prady, 2018).

For example, despite its broad coverage of the population, a sizeable under-coverage of lower-income groups still exists under the public distribution system

(PDS). The National Sample Survey 2011–12, observes that approximately 20% of households in each of the bottom two income quintiles do not receive any benefits. At the same time, a large proportion of the higher-income deciles receive PDS subsidies, with the richest 40% of households receiving 35% of total PDS subsidies. Due to this under-coverage and leakage, most income deciles receive a similar share of total PDS benefits. It has also been estimated that 36% of PDS total spending never reaches the intended households due to the existence of 'ghost beneficiaries' and the large illegal diversion of subsidised goods resold on the open market. That is, out of every ₹100 spent on the program, only ₹64 reaches households (Ministry of Finance, 2017).

Misallocation of funds is another major issue. The poorest areas of the country often obtain a lower share of government resources when compared to their richer counterparts. Many districts in Uttar Pradesh, Bihar, Chhattisgarh, parts of Jharkhand, eastern Maharashtra, Madhya Pradesh and Karnataka, among others, account for a large share of the poor but receive a less-than-equal share of resources. In the case of MGNREGS, despite accounting for over half the poor in the country, these states accessed only a third of the resources spent on the programme in 2015–16. This almost certainly implies that some deserving individuals are left out (Ministry of Finance, 2017).

4.2 Recent advancements: improving operational efficiencies through 'JAM trinity'

In search of a more efficient system, India's policy on social assistance has been heading towards UBI in the past few years in a planned manner. It started with the establishment of the 'JAM trinity' (Jan Dhan – universal bank accounts, Aadhaar – biometric identity and mobile phones) for providing the technological base for performing cash transfers directly to the accounts of individuals and families. Centralised cash payments to beneficiaries necessitates identification, widespread reach of banking services and a medium for performing digital transactions. The Aadhaar biometric identification system has covered 99% of the population aged 18 and above. The Jan Dhan scheme has enabled 46% of households to access bank accounts, and mobile phone coverage has been extended to 87% of the population (Coady and Prady, 2018 and INFORM Report, 2020).

Several cash transfer experiments and programmes were launched in the last two decades. Janani Suraksha Yojana (JSY), PM Kisan and Pradhan Mantri Garib Kalyan Yojana (PM-GKY) are the prominent cash transfer initiatives in India. JSY, one of the world's largest conditional cash transfer programmes for health, was launched in 2005. Evaluations of JSY programmes reveal that conditional cash transfers are a good vehicle for enhancing access to health services in the Indian context (Seshadri and Rajan, 2014).

PM-KISAN, an unconditional cash transfer programme, was launched in 2019 (Varshney et al., 2020). As a response to the COVID-19 crisis, the Indian government announced a package public transfer programme, namely Pradhan Mantri Garib Kalyan Yojana (PMGKY), with a budget of US\$25 billion (Varshney et al., 2020a). The package includes income support, cash transfers for women, conditional cash transfers for buying cooking gas, and free food rations. Early evaluations of PM-KISAN and PM-GKY have registered positive effects of the programmes among the beneficiaries in addressing poverty and vulnerability issues (Varshney et al., 2020 and Varshney et al., 2020a).

In 2013, the Indian government launched Direct Benefit Transfer (DBT) as a pilot in 11 districts. The scheme aimed to ensure the crediting of cash benefits directly into the account of the beneficiary, eliminating leakage and improving efficiency. In 2014, DBT was further expanded across the country, covering

scholarship schemes, liquid petroleum gas subsidy and MGNREGS. In 2017, DBT covered 400 schemes in 46 ministries. Cash transfers are performed through public financial management systems (Paramasivam and Arunkumar, 2020). During the COVID-19 lockdown, ₹366.59 billion were transferred to the bank accounts of the beneficiaries (Ministry of Finance, 2020).

In this context, recommendations made in the Economic Survey Report 2016–17 (Ministry of Finance, 2017) to switch the social assistance landscape over to UBI have gained significance in the policy arena in India.

4.3 The universal basic income (UBI) debate

Research work conducted worldwide has registered the positive impacts of cash transfer instruments in addressing poverty issues among beneficiaries (Arnold et al., 2011). The present study, that analyses the performance of the social assistance instruments in light of climate resilience, also concludes that cash transfer instruments can significantly reduce vulnerabilities more than other instruments. The Economic Survey Report 2016–17 claims that UBI can reduce poverty in 'one fell swoop': selection errors can be substantially minimised, leakages of funds during implementation can be eliminated, universal financial inclusion can be achieved and administrative efficiency will be enhanced. Coady and Prady (2018) empirically projected that performance of the efficacy parameters – namely coverage, target accuracy and benefit adequacy – will be significantly enhanced if UBI is implemented in place of the PDS and energy subsidy programmes.

Critics argue that UBI is built on weak foundations and it will fail miserably during operationalisation. They point to the high rates of failure of biometric authentication using Aadhaar technology, and claim that the technology will require more time for standardisation. Similarly, Jan Dhan and mobile phones technologies in India are still in their formative stages and are fraught with problems. It is also contended that the volume of outlays that may be required to implement UBI will be substantial and it will be challenging for the government to mobilise the funds (Randhawa, 2019). Khosla (2018), in his work on UBI, has estimated the cost of different UBI proposals for India: while the proposed annual cash transfers ranged from ₹3,500 to ₹13,432, the estimated cost of these proposals varied from 3.5% to 11% of GDP. Simulation analysis carried in the present study found that to achieve a desired level of vulnerability score (1.39), India may have to spend 3.5% of GDP.

BOX 8. ESTIMATING THE COST OF CASH TRANSFER PROGRAMMES FOR ALL THE EXTREME POOR IN INDIA

Using data from the ASPIRE (2017) database and the INFORM Report (2020), a simulation exercise was conducted to evaluate the feasibility of the universal basic income proposal in India.

A regression model was run by considering the INFORM vulnerability score as the dependent variable (y), coverage of the extreme poor under UCT programmes (x_1), spending on UCT programmes (x_2) and GDP per capita (x_3). The countries for which the data was available were considered for the analysis ($n=81$). The results of the regression revealed the F value as 55.56, which is statistically significant, and the coefficient of determination (R^2) value as 0.68. Hence the model is fit. Regression coefficients of spending on UCT (x_2) and GDP per capita (x_3) are statistically significant and are negative. This indicates that increased spending on UCT has a higher probability of reducing vulnerabilities. Coverage of extreme poor under UCT programmes (x_1) is negative but statistically not significant.

The simulation analysis for India aims to help understand how much spending on UCT needs to be increased to attain a desirable state of vulnerability. The following assumptions were considered for the simulation:

- 100% of extreme poor are covered under UCT programme
- Vulnerability score is on par with Poland, ie 1.39 (developed country score considered in the current study)

Results of the simulation analysis showed that India may have to spend 4.8% of GDP on unconditional cash transfers to cover 100% of the extreme poor under the cash transfer programme, to reduce the vulnerability to a desirable level (1.39). As per the INFORM Report (2020) India's vulnerability score

is 5.8 and as of 2011 the country spent 0% of GDP on unconditional cash transfers. Researchers have calculated the estimated cost of different UBI proposals for India. Economic Survey (2017) predicted a cost of 4.2–4.9% GDP to cover the bottom 75% of the income distribution in the country under a UCT programme. Khosla (2018) compiled different cost estimates by different Indian economists on the UBI proposal, and the predicted value ranged from 3.5% to 11% of GDP for varying transfer amounts.

Another regression model was run under the current study to explore alternative options, by including coverage and spending variables of public works and food and in-kind programmes in addition to the coverage of extreme poor under UBI. The model is fit as F value is 26.94 and is statistically significant and coefficient of determination value is 0.721. Intercept and regression coefficient of GDP per capita and spending on UCT and public works are statistically significant. Simulation analysis was undertaken by considering the two assumptions that:

- 100% of extreme poor are covered by the UCT programme, and
- Existing coverage and spending of public works and food and in-kind programmes are retained.

While this analysis was constrained by lack of data availability, and the results may need further unpacking to provide a more accurate estimate, the preliminary analysis shows that unconditional cash transfer programmes will require funds to the tune of 2.72% of GDP to achieve the desirable vulnerability levels (vulnerability score-1.39). By adding spending on public works (0.25% of GDP) and food and in-kind (1.02% of GDP), India will require funding of 3.99% of GDP to implement this mixed model of social assistance instruments.

4.4 Climate resilience perspectives on India's UBI proposal

While the 'no-strings-attached' UBI system is perceived as a panacea to India's underperforming social assistance instruments (Ministry of Finance, 2017), it also faces disapproval from the critics. For now, however, this debate does not consider climate resilience within the ambit of development outcomes of the proposed programme or in its design features.

UBI is primarily considered an income support instrument by the provision of cash support directly to individual units. Like other social assistance instruments in the country, UBI does not integrate climate resilience-related features in its design. For a country like India, that is one of the most hazard-exposed regions in the world – with an INFORM natural hazard score of 7.8 (maximum 10) and human hazard score of 7.0 (maximum 10) – integrating resilience components into the social assistance instruments is highly necessary. Hence it would be desirable for climate resilience elements to be considered while designing social assistance programmes.

Cash transfer instruments are designed on the assumption that low and variable income is the primary cause of poverty. It is also assumed that transfer of cash, on a regular basis, will help families smoothen consumption and sustain spending without needing to sell out assets or take out debt, thereby protecting living standards (Arnold et al., 2011). Cash transfers are one of the most thoroughly researched forms of social assistance and there is convincing evidence from a number of countries that cash transfers can largely promote the short-term absorptive capacity of households. The instrument's ability to build long-term adaptive and transformative capacity is proven to be limited (Tenzing, 2020). Climate risks have long-term implications and the programmes that address such risks should build long-term adaptive capacities rather short-term coping strategies. Against this background, the contribution of the public works programmes, like MGNREGS, in reviving wastelands, restoring water bodies and canals, and improving the skills of people to enhance climate resilience needs to be positively considered.

Results from the present study reveal that cash transfer instruments are more expensive than other forms of social assistance. While among the sample countries considered in the study the average per capita transfers held by the extreme poor (<\$1.9 a day) for social pension, UCT and CCT are US\$1.67, US\$0.82 and US\$0.45 respectively, the value is US\$0.17 and US\$0.13 for food and in-kind programmes and for public works programmes respectively. Similar patterns exist in the case of the benefit adequacy of the different social assistance instruments. On the other hand, the benefit-cost ratio is the lowest for social pension and cash transfer programmes and the highest for public works, food and in-kind and school feeding programmes. While the BCR of India's MGNREGS programme is 0.32, the value for Poland's UCT and Argentina's CCT are much lower at 0.03 and 0.06 respectively. Comparisons with India's existing cash transfer programmes cannot be made here as these programmes are recent, and data on BCRs does not exist. However, the benefit-cost of Brazil's Bolsa Familia programme, the world's largest CCT programme – which served as the model for the Niti Aayog's proposed revamping of the Scheduled Caste and Scheduled Tribes Sub Plans³ – is 0.26, which is lower than the benefit-cost ratio of MGNREGS.

While the present study results prove that cash transfer instruments are more effective in reducing vulnerabilities, they also suggest that desired results will be achieved only if they are adequately funded. The policymakers need to consider this aspect while defining the quantum of benefits that are required to achieve the desired outcomes.

The proposed UBI scheme considers programme beneficiaries as agents and not subjects. The families/ individuals who receive the cash support are free to determine their consumption priorities. The existence of competitive markets is the prerequisite for beneficiaries to exercise their consumption choices, however, in the event of disasters, market systems collapse and sellers tend to exercise monopolistic powers (Randhawa, 2019), which is evident in the present COVID-19 pandemic situation. In such instances, the value of cash quickly erodes and special interest groups can easily hijack benefits of cash transfer benefits.

The structure of the Indian economy is predominantly rural with inadequate infrastructure and connectivity, although these are improving gradually (Randhawa, 2019). Since market penetration in rural areas is not strong, cash-based instruments alone may not yield desired results, rather a package of instruments will be required to achieve better outcomes. Results of a study conducted by Varshney et al. (2020a) on PMGKY in the rural areas of four north Indian states to assess the effectiveness of the programme in increasing the coping capacity among the beneficiaries against COVID-19, explains this well. The results of the study reveal that the impact was better among the beneficiaries who received benefits from all four components than the ones who received only income support. This aspect of packaging components to build climate resilience needs to be considered when designing cash transfer programmes, rather than providing only monetary support.

There exist a whole host of different social assistance instruments and climate change adaptation programmes with independently defined objectives and strategies. As presented by Cecchini and Martínez (2012), however, a major challenge is to devise and implement mechanisms for coordinating policies and their operational instruments. This is required both to respond effectively to people's social assistance requirements and also to meet the need for coordinating across sectors (horizontal integration) and coordination between levels of the government (vertical integration).

Financial preparedness of state systems is the key for better managing disasters. The COVID-19 pandemic has exposed the gaps in risk-based financial planning in the social assistance programmes of India. The country was able to allocate only 1% of GDP as an immediate response to the pandemic, while developed countries like Germany, America, Spain and so on assigned over 20% of their GDP (Krishnan, 2020). Risk-based planning and financial preparedness should be the essential elements of India's proposed social assistance instrument.

UBI could emerge as a comprehensive tool to address poverty and vulnerability if it integrated climate resilience elements in its design.

³ https://economictimes.indiatimes.com/news/politics-and-nation/niti-draws-up-cash-transfer-plan-for-poor-scs-sts/articleshow/79434797.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

5

Strategies for enhancing the efficiency and adequacy of social assistance programmes in delivering climate resilience

The current research was undertaken to assess the potential of scaling up social assistance spending for enhancing climate resilience. Quantitative and qualitative analyses were undertaken using efficacy indicators for different types of social assistance programmes. Climate risks were represented by the INFORM Risk Index (2020).

The results of the regression models reveal that CCT, UCT and social pensions have a higher likelihood of reducing vulnerability. The results also show that ensuring high standards of target accuracy and benefit size is key to reducing vulnerability. The comparative

analysis of efficacy indicators across different risk categories shows that countries with lower risks (eg Poland and Argentina) achieve higher coverage, adequacy of benefit and average per capita transfer than higher-risk countries (eg Chad, South Sudan, Ethiopia and India). Further, the results indicate that benefit adequacy and average per capita transfer are highest for UCT and social pensions. The benefit-cost ratio, for most of the social assistance instruments, is higher for countries with higher risks (eg Chad, South Sudan, Ethiopia and India). Using results from the study, the idea of UBI in India was examined from a climate resilience viewpoint.

Recommendations from this study will be relevant for developing countries like India that aim to evolve social assistance programmes to comprehensively address poverty and vulnerability and build climate resilience, while dealing with inefficiencies, leakages and misallocations.

5.1 Strategy for enhancing climate resilience outcomes of social assistance programmes

Setting up comprehensive social assistance system to address climate risks

- Complementarity between different social assistance programmes:** Poor households, when hit by a disaster, often cope by reducing essential food consumption, healthcare, and education investments, and by selling or depleting productive assets. To enhance climate resilience, social assistance programmes need to complement each other and offer access to a range of services – such as education, health, nutrition, skill enhancement, and so on – to vulnerable communities.
- Rights-based framework and decentralised implementation architecture:** The design features of national-level social assistance programmes could include a rights-based social assistance system and a decentralised implementation architecture. Rights-based social assistance systems (such as rights-based access to decent work, food security, shelter and so on) provide assurance of a basic safety net in times of crisis, and well-functioning decentralised national social assistance programmes distribute benefits more effectively, particularly in times of crisis.
- Robust management structures:** Many countries have a plethora of small social assistance programmes managed by a range of ministries, with limited coordination. An overhauling of existing management structures is necessary to establish a comprehensive social assistance system that is cost effective and efficient in its delivery. This overhauling could involve: (i) development of nuanced approaches to delivery mechanisms to ensure immediate relief, (ii) revitalising social assistance programmes to prevent communities from slipping back into poverty after a crisis, (iii) strengthening progress towards universal social assistance, and (iv) redesigning social assistance systems that are more responsive to shocks, including climatic shocks. The best practices from governance mechanisms for social assistance programmes in Latin American countries should be adopted for designing the coordination mechanisms: Latin American countries have successfully promoted coordination between different programmes at policy, technical and operational levels.
- Special considerations for vulnerable and marginalised groups:** Social assistance programmes need to factor in the diverse needs of women and men, as well as more vulnerable groups like single women, elderly people, children, people with disabilities, and so on. If the eligibility for social assistance programmes is underpinned by a universal database that also includes exposure to climate or natural hazards (along with socioeconomic vulnerability) as targeting criteria, individuals exposed to high climate risks can be prioritised and could typically get access to all resilience initiatives through a single registry. This represents an opportunity to enhance the effectiveness and complementarity between different social assistance programmes. The increase in the number of displaced communities during climate and natural disasters also warrants the need for the portability of social assistance benefits.
- Embedding social assistance programmes within a larger climate and development planning framework:** To enhance effectiveness and improve the cross-cutting of climate, social and economic impacts, there is a need to build social assistance systems that are embedded within a larger climate and development planning framework – such as nationally determined contributions (NDCs), national adaptation plans (NAP), Sustainable Development Goals (SDGs), and so on. For example, linking public works programmes, like MGNREGS, which create soil and moisture conservation assets on the farmland of small and marginal farmers, with agriculture programmes can help increase productivity, reduce input costs, enhance knowledge on climate-resilient agricultural practices and improve returns from farming, thereby enhancing climate resilience. Similarly, cash transfers can be linked with skill development or social health insurance programmes to generate a systematic approach to more comprehensive climate resilience and development outcomes. Such an approach can balance climate and social spending priorities to jointly achieve pro-poor and climate-resilient growth and development.
- Maximising outreach:** Innovative strategies could be employed to make social assistance available to the maximum possible number of beneficiaries. For example, midday meals can be made available to all school-going children, to partly address the issue of nutrition and partly the issue of attendance. But the ultimate beneficiary is not 'individually' identified, but is a part of a 'class' of people.

Maximising the value of social assistance investments through the right mix of delivery instruments most suited to the local context.

When designing social assistance programmes, countries need to diversify their investments into instruments that provide better cost benefit, coverage, benefit size, adequacy and targeting for their specific context, rather than adopting a 'one-size-fits-all' approach.

It is easy to conclude from the benefit-cost analysis of the present research work that cash transfers and social pensions instruments are the best choice for countries. However, other crucial factors such as financial capacity and administrative capacity of the country, the availability of the required technology and infrastructure, the degree of vulnerability and so on, should also be contemplated before deciding on the selection of appropriate instruments.

Low-income countries in general cannot afford large-scale cash transfers and social pensions when universal coverage is targeted. These instruments are expensive, requiring higher average per capita transfers to produce intended results. In considering such constraints the following strategies could be employed by countries with higher risks and lower income levels:

- A mix of instruments could be selected. Instruments that require less average per capita transfer amounts and produce higher BCR could be implemented along with cash transfer programmes. Instruments such as public works, food and in kind, and school feeding have substantially higher BCR and less average per capita transfer values than cash transfer programmes. Higher risk countries (eg Chad, South Sudan, Ethiopia and India) could consider employing these instruments along with cash transfers.
- Instruments that show better performance in higher risk contexts could be given priority. For example, public works programmes exhibit a better performance in higher-risk countries (eg Chad, South Sudan, Ethiopia and India), in terms of coverage, benefit incidence, benefit adequacy, BCR and average per capita transfer. It could be inferred that design features of public work programmes are more appropriate for the conditions of countries with higher risks. Hence, public works programmes could be given higher consideration by higher-risk countries over other social assistance instruments.

The choice of the instruments that are incorporated into a social assistance system must be properly designed and contextualised in order to achieve climate resilience and development outcomes. The key aspects to consider are:

- (i) Institutional and governance mechanisms: What are the institutional and governance systems that will be used to deliver the programme to the local level/targeted beneficiaries and will the community have a say and control over the decision making?
- (ii) Targeting: What are the targeting mechanisms and conditionalities – in terms of how effective is the targeting at reaching poor households and excluding the non-poor – and what does it cost to implement this approach compared to what is achieved?
- (iii) Integration and coordination: Where within the government will the programme be housed and how will the social assistance instruments be integrated into a broader climate and development policy framework?

These factors influence sustainability and impact, and will have an important bearing on the success of the programme.

Integrating shock-responsive mechanisms within existing social assistance instruments.

Public works-based social assistance programmes are particularly suitable for addressing climate vulnerability in economies that are largely dependent on agriculture or seasonal work. In the event of a climatic or economy shock, or an economic downturn like COVID-19, public works programmes can provide a productive safety net in the form of cash or food, and can also create assets for long-term resilience. For example, during the 2011 drought in the Horn of Africa, the Ethiopian PNSP was able to absorb an additional 3.1 million people and effectively ward off a humanitarian crisis.

IIED's research shows that MGNREGS in India is already playing a significant role in building resilience to climate risks among the poorest households. Of the 651 respondents surveyed across Andhra Pradesh, Jharkhand, Odisha and Sikkim, 64% reported change in their livelihood capital to absorb, adapt or transform for addressing the impacts of climate change. IIED's findings indicate that the level of climate exposure and the nature of livelihood capital influence the type of resilience outcomes that households can achieve. By providing guaranteed wages and creating public natural resource management infrastructure, MGNREGS helps households accumulate the natural and financial capital they need to maintain consumption when exposed to infrequent and low- to medium-intensity climate hazards. But for households to adapt and transform their livelihoods in response to high-intensity climate shocks, programmes like MGNREGS will need to integrate climate risk management strategies in their design. The integration will ensure the programme is delivering

shock-responsive wages, creating climate-resilient infrastructure, and strengthening institutions' use of climate information.

There is a need to redesign and strengthen schemes like MGNREGS, so that they are: (i) universal and do not operate under urban-rural silos, (ii) comprehensive, and cover entitlements and facilities that can help families cope and survive under climate-induced duress, (iii) inclusive and suitable for all vulnerable and marginalised communities, and (iv) that they offer portable entitlements guided by the principles of mobility by creating a national database for each family.

Putting a system in place and building resilience before a crisis hits is more cost effective than responding later with a humanitarian response: every US\$1 spent on disaster resilience resulted in benefits in the form of reduced humanitarian spend, avoided losses and made development gains, of US\$2.8 in Ethiopia, and US\$2.9 in Kenya (CHASE, 2012).

Develop robust information systems and use technology to improve risk responsiveness.

The effectiveness of social assistance instruments depends on robust climate information systems, as well as the capacity of social assistance programmes to identify and pre-register beneficiaries, and implement anticipatory actions, before the disaster occurs. Social assistance systems need to be informed through periodically updated projections of climate impacts on different geographies and across temporal scales, in order to implement well-planned, timely and targeted responses. This requires experimentation and innovation in data collection, risk modelling, structuring of financial mechanisms and market-based instruments, testing of forecasts and triggers, feedback loops, and disbursement channels.

Technology can substantially improve cost effectiveness in programme delivery, especially in addressing 'last mile' connectivity. Technological innovations, through use of artificial intelligence and digital technologies, can help decision makers manage new risks and develop forecast-based applications for disaster forecasting, and their associated crises – such as famine, drought and political conflict. Similarly, innovative technologies such as digital payment systems hold significant potential to improve disaster-risk finance solutions. The 'JAM trinity' initiative of India is a classic example, among developing countries, of the application of technology to advance the social assistance system towards higher efficiency and effectiveness.

Creating safety nets through global business and supply chains

In the context of least developed countries (LDCs), where countries are already struggling to finance universal social assistance coverage due to low domestic resource mobilisation and limited fiscal space, the responsibility of social assistance coverage and access to basic facilities for workers could be shared by global supply chains.

Meanwhile in countries like Bangladesh, links to the global ready-made garment sector have ensured better working conditions and formalisation in the sector, but such linkages do not necessarily translate into stable employment and good working conditions. The issue of poor working conditions, such as occupational safety and health, minimum wages and prolonged working times without compensation, are prevalent. Such failures have also contributed to informality – the undermining of labour rights, lack of collective bargaining, non-standard forms of employment, use of intermediaries and even the presence of child and forced labour. However, there are many global brands that consciously promote socially responsible supply chains.

BOX 9. BUILDING GLOBAL SOCIALLY RESPONSIBLE SUPPLY CHAINS

Tony's Chocolonely is a chocolate brand that was launched to raise awareness of slavery and child labour in the cocoa industry. The brand reached a €88.4 million turnover in 2020, a jump of 27% from the previous year. Tony's is the market-leading brand in the Netherlands purely through word-of-mouth publicity, without any form of paid advertising. The chocolatier operates in 20 other markets including the US, the UK, Belgium and France. Instead of the usual chocolate squares, Tony's bar is divided into unequal and uneven pieces and the uneven portions represent the unfair and unequal elements of the cocoa industry – where company CEOs are paid in millions, whilst children at the beginning of the supply chain work without rights and proper compensation. While the company can be credited with creating awareness amongst consumers regarding child and bonded labour practices in the cocoa industry and for sourcing products only from supply chains that are free from slavery, it is also important to understand that by doing so, it may be excluding supply chains that may not be able to afford compliance with their business process norms. In such cases, instead of helping the poor and vulnerable who are barely able to make their end meet, the compliance norms end up further excluding them.

Brands like Tony's Chocolonely need to invest in and share the burden of creating social safety nets for people working in their supply chains in LDCs, in terms of insurance, health cover and employment security. Apart from a commitment to source products from supply chains free of exploitation, companies also need to come forward with their commitment to create new supply chains in vulnerable countries and regions, particularly targeting areas that may have recently been devastated by climate or natural disasters. In India, enterprises established with new environmentally-friendly FaL-G brick technology earn about US\$3.2 million, or approx ₹14.5 crores, in carbon credit revenues. About 12% of this revenue is used for improving the lives and working conditions of FaL-G brick plant labourers. Workers are covered by health and accident insurance and provided with protective gear for use at their workplace. In addition, HIV awareness programmes are conducted. Toilets, showers and drinking water facilities, all of which are rarely found in rural India, have also been installed at FaL-G production sites (World Bank, 2012).

5.2 Enhancing the funding base of social assistance to enhance climate resilience outcomes

Leverage climate finance to support climate resilience instruments within social assistance programmes

Climate finance can potentially offer greater quantity and quality of finance to scale up the contribution of social assistance programmes towards climate resilience, and help manage the climate-induced financial risks of programmes. For example, India could use climate finance from the National Climate Change Missions, the National Adaptation Fund for Climate Change and international sources to integrate climate risk management into MGNREGS. These sources could help meet the additional costs of creating climate-resilient infrastructure and skills. MGNREGS service providers can also explore using risk finance through insurance and forecast-based financing instruments to maintain investment in climate-resilient assets in the event of a climate shock, and use resilience bonds to scale up investment in these assets. Convergence

between the financial mechanisms used to deliver these finances can also improve the quality of investments. For example, MGNREGS' Employment Guarantee Fund is a basket fund that pools finance from different sources and allocates them to community-identified priorities. Its Electronic Fund Management System provides direct budget transfers to beneficiaries, making it the government's most transparent and efficient fund transfer mechanism. MGNREGS can use these mechanisms to channel additional sources of climate finance to scale up investments in inclusive and climate-resilient interventions (Kaur et al., 2019).

International climate finance mechanisms like the Green Climate Fund (GCF), Global Environment Facility (GEF), Climate Investment Fund (CIF), European Commission Directorate-General for International Cooperation And Development (DG DEVCO) and Adaptation Fund could consider funding existing social assistance programmes with additional components that offer to strengthen or create climate resilience outcomes. Some mechanisms that can be considered are:

- Scaling up of existing social assistance programmes to target climate hotspots and climate-vulnerable populations at times of extreme climate events or disasters
- Enhanced entitlements or benefit amounts during a crisis to compensate communities for loss of livelihoods
- Setting up of early warning systems and GIS tools for the planning, delivery and monitoring of social assistance programmes
- Developing localised indices of poverty and climate change hotspots for social assistance programmes
- Systems and support mechanisms for anticipatory delivery of entitlements and benefits based on climate risk assessment
- Integration of climate risk management into decision making through innovative tools and strengthened capabilities
- Capacity building and awareness generation programmes on climate risk management
- Developing skills for climate-resilient livelihoods and natural resource management

Table 15 provides some of the ways in which different social assistance instruments can be strengthened to deliver climate resilience outcomes in the context of LDCs.

Table 15. Potential interventions that could promote resilience in social assistance programmes in low-income countries

ABSORPTIVE CAPACITY	ADAPTIVE CAPACITY	TRANSFORMATIVE CAPACITY
Cash transfers		
<ul style="list-style-type: none"> • Target vulnerable communities and regions during climate stress/ disaster events • Increase benefit package or entitlement during disasters 	<ul style="list-style-type: none"> • Financial inclusion (bank account, insurance enrolment etc) • Skills training for beneficiaries • Support for asset creation • Behavioural change related to climate resilience 	<ul style="list-style-type: none"> • Comprehensive cover – facilitate access to other entitlements • Market linkages • Strengthen local institutions and social cohesion • Promote community leadership and decision making • Promote collaborations between CSO, CBOs and government
Social pensions		
<ul style="list-style-type: none"> • Provide additional cash support during disaster/ extreme climatic events • Target accuracy for vulnerable populations 	<ul style="list-style-type: none"> • Financial inclusion (bank accounts, insurance enrolment etc) for elderly, differently abled, destitute etc. • Facilitate access to other entitlements from government for beneficiaries 	<ul style="list-style-type: none"> • Comprehensive cover – facilitate access to other entitlements • Involve community organisations eg elderly associations and their networks • Promote linkage between CBO and government departments
Public works programmes		
<ul style="list-style-type: none"> • Cash or food for work on a regular basis • Humanitarian assistance during disasters 	<ul style="list-style-type: none"> • Improve natural resource management assets on community and individual land • Financial inclusion (bank account, insurance enrolment etc) • Vocational skills training on new trades 	<ul style="list-style-type: none"> • Comprehensive cover – facilitate access to other entitlements • Market linkages • Strengthening local institutions and social cohesion • Promote community leadership and decision making • Promote collaborations between CSO, CBOs and government
School feeding programmes		
<ul style="list-style-type: none"> • Financial and non-financial assistance for the school children 	<ul style="list-style-type: none"> • Behavioural change related to climate resilience eg nutrition, WASH, disaster response • Build capacity of the school children to chart disaster preparedness planning for the local community • Work with the parents to promote desired behaviours 	<ul style="list-style-type: none"> • Promote student clubs that would lead the agenda of climate resilience • Nurture leadership abilities among the school children • Facilitate linkage between the student clubs and government departments
Food and in-kind programmes		
<ul style="list-style-type: none"> • Food and in-kind support on a regular basis • Accurate targeting • Humanitarian support during disasters 	<ul style="list-style-type: none"> • Link with other forms of social assistance programmes like public works, cash transfer etc. 	<ul style="list-style-type: none"> • Work with community organisations and collectives • Convergence with other government programs

ABSORPTIVE CAPACITY	ADAPTIVE CAPACITY	TRANSFORMATIVE CAPACITY
Fee waivers		
<ul style="list-style-type: none"> • During disaster conditions: <ul style="list-style-type: none"> • Introduce new waiver • Increase the subsidy amount • Relax the criteria for availing benefit during disaster conditions 	<ul style="list-style-type: none"> • Link with other social assistance programmes • Introduce conditions related to climate resilience behaviours for availing the benefits 	<ul style="list-style-type: none"> • Involve community organisations to channel the benefits

Domestic resource mobilisation for universal social assistance coverage

Social assistance spending is constrained by low revenue bases and low tax-to-GDP ratios impacting domestic resource mobilisation for social assistance programmes in many LDCs. At the same time social assistance programmes have evolved in a fragmented manner, with a number of small programmes divided across various ministries and agencies without one central coordinating body. This inefficiency is of particular concern given the low levels of financing for social assistance. There is a need for greater coherence across social assistance programmes and optimisation of existing funds, with a view to achieving universal social assistance coverage.

Results of the simulation analysis showed that India may have to spend 4.8% of GDP on unconditional cash transfers to cover 100% of the extreme poor under the cash transfer programme, to reduce vulnerability to a desirable level (1.39) from its current vulnerability score of 5.8, as per the INFORM Report (2020). Results from another regression model show that unconditional cash transfer programmes will require funds to the tune of 2.72% of GDP to achieve the desirable vulnerability levels (vulnerability score – 1.39). By adding current spending on public works (0.25% of GDP) and food and in-kind (1.02% of GDP), India will require funding of 3.99% of GDP to implement this mixed model of social assistance instruments (see Box 8). Countries will need to carry out a similar analysis to understand the optimum mix of different social assistance instruments to reduce their vulnerability and address climate risks. This can help to optimise allocation of public expenditure for social assistance while creating desired impacts on the targeted population.

Further to this, a sharing of tax revenues by the national government with sub-national and local government, on the basis of a social assistance index developed by integrating poverty, vulnerability and climate data, is

needed. India's experiment with allocation of additional tax revenue to state governments based on forest cover can be used as a model to transfer more funds based on an index that accounts for social assistance programmes and climate vulnerabilities.

In India, the central government collects about US\$200 billion in taxes every year and out of this about US\$60 billion is passed to state governments as untied funds based on the recommendations of the Finance Commission. Over the years, tax devolved to states has constituted over 80% of the total central transfers to states and is based on a formula that includes factors like population, poverty, area and so on. The 14th Finance Commission (implemented over 2015–2020) recommended adding a weight of 7.5% to account for the forest cover, in the formula that determined the amount of tax revenue distributed by the central government to the states. This meant that the states with better forest cover were able to receive higher share of central tax revenue (Mann, 2018). The reason for adding forest cover was to compensate states for the 'fiscal disability' by forgoing other economic activity and to recognise the 'huge ecological benefits' provided by forests. A similar approach may be adopted for allocating funds to states where additional weightage may be allocated to the formulae that account for climate vulnerability.

The resource mobilisation for social assistance instruments can also be undertaken by diverting energy subsidies and carbon revenue to support the climate resilience aspects of these programmes. For example Egypt has removed its energy subsidies and reallocated a share of the budget to social assistance programmes targeted to the poorest. In India the government collects ₹400 rupees/t (\$5.60/t) levy on coal produced or imported. From 2010 to 2017, about ₹864 billion (~\$13.3 billion) has been collected through the Clean Environment Cess. A part of this fund can be diverted to support social assistance programmes under the principles of just transition.

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Annex 1: methodology adopted for cost-benefit analysis- efficacy and effectiveness

1. Frequency analysis

The analytical framework adopted by the World Bank (2018) in the 'State of Social Nets Report' was used in this research to compare the efficacy and effectiveness of different social assistance delivery instruments. OECD (2019) followed this framework to review the social protection systems in Indonesia. This framework includes efficacy parameters such as coverage, benefit incidence, benefit adequacy, cost effectiveness and efficiency. A brief description of the parameters (World Bank, 2018) are:

- **Spending** indicates the programme budget. In most cases, the costs of benefits provided account for spending.
- **Number of beneficiaries** indicates the number of people or households who benefit from the programme.
- **Coverage** indicates the absolute number of programme beneficiaries, or the percentage of population or a given population group that benefits from a given social assistance programme. Coverage is important because it indicates the size of the programme 'blanket' in both absolute and relative terms.
- **Beneficiary/benefit incidence** shows which segment of the population receives the programme benefits. The beneficiary/benefit incidence can indicate what percentage of the total number of beneficiaries/total amount of benefits go to the poorest quintile of the welfare distribution.
- **Benefit level** indicates the amount of benefit, whereas '**benefit adequacy**' is a measure of the relative benefit level. The main purpose of estimating benefit adequacy is to understand to what extent the benefit size is small or large in comparison to a benchmark (for example, average income/ consumption in a country, poverty line, minimum subsistence level, minimum wage, or per capita GDP).
- **Poverty/inequality impact** reveals the distributional effects of the benefit. Regarding poverty impact, two indicators are often looked at:
 - percentage reduction in the poverty headcount (prevalence) as a result of the benefit; and
 - Percentage reduction in the poverty depth (distance to the poverty line).

1.1 Formulae used for the efficacy analysis in the study

a. Coverage

Percentage of population participating in social assistance and labour programmes (includes direct and indirect beneficiaries). The indicator is reported for the entire population and for the poorest quintile of the post-transfer welfare distribution. Specifically, the indicator is computed as:

$$\text{Coverage} = (\text{number of individuals in the quintile who live in a household where at least one member receives the transfer}) / (\text{number of individuals in that quintile}).$$

b. Benefit incidence

Percentage of benefits going to the poorest quintile of the post-transfer welfare distribution relative to the total benefits going to the population. Specifically, benefit incidence is:

Benefit incidence = (sum of all transfers received by all individuals in the quintile)/(sum of all transfers received by all individuals in the population).

The indicator includes both direct and indirect beneficiaries.

c. Average per capita transfer

Average transfer amount of social assistance and labour programmes among programme beneficiaries (per capita, dollar purchasing power parity, \$ppp). The indicator is estimated for the entire population. For each household, per capital average transfer is estimated as total transfers received divided by the household size. Specifically the indicator is calculated as

Average per capital transfer = (Average transfer amount of social assistance programmes/the total number of individuals received the benefit)

d. Adequacy

The total transfer amount received by all beneficiaries in a quintile as a share of the total welfare of beneficiaries in that quintile. The indicator includes both direct and

indirect beneficiaries and is reported for all population and the poorest quintile. The indicator is calculated as:

Benefit adequacy = (total transfer amount received by a family/a benchmark like average family income or poverty line income in the country)

e. Benefit-cost ratio

Percentage reduction in poverty gap obtained for each \$1 spent in social assistance programmes:

Benefit-cost ratio is estimated as (Poverty gap pre-transfer – poverty gap post-transfer)/total transfer amount

The cost-benefit comparison between the social assistance tools has been undertaken at two levels – frequency analysis and regression analysis.

1.2 Indicators used

The list of indicators under each efficacy parameter is given in Table 16.

Comparison of efficacy and efficiency of the social assistance programmes using the above listed indicators was done through frequency analysis cross-tabulated with INFORM Risk Index.

Table 16. Indicators used for comparative analysis

INDICATORS	SOURCE OF DATA
Climate risks and vulnerabilities	
Climate risks and vulnerabilities were represented by the INFORM Risk Index. It was applied as a cross-cutting variable. A cross-tabulation analysis was done on the performance indicators of social assistance programmes using the INFORM Risk Index as a cross-cutting variable.	INFORM Report (2020)
Qualitative inferential analysis was done using a resilience framework that consisted of the following broader variables <ul style="list-style-type: none"> • Absorptive resilience • Adoptive resilience • Transformative resilience 	Research literature
Coverage and benefit incidence	
<ul style="list-style-type: none"> • Share of the total population that receives social assistance programme benefits • Share of the poorest quintile that receives social assistance programme benefits • Distribution of beneficiaries by quintiles of pre-transfer welfare 	ASPIRE (2017)
Benefit adequacy	
<ul style="list-style-type: none"> • Per capita average transfer • Share of benefits with respect to per capita household income consumption 	ASPIRE (2017)

INDICATORS	SOURCE OF DATA
Efficiency	
<ul style="list-style-type: none"> • Cost-benefit analysis • Correlational analysis comparing per capita spending on social spending with risk metrics such as the World Risk Index, Vulnerability Index, food security risk, inequality (GINI) index etc. 	ASPIRE (2017) INFORM Report (2020)
Cost effectiveness of spending on social assistance	
<ul style="list-style-type: none"> • Average social assistance spending • Per capita spending on social assistance 	ASPIRE (2017)

2. Regression analysis

Regression analysis was undertaken to understand i) how spending on different social assistance delivery mechanisms affects climate risk-related vulnerabilities and ii) how efficacy of the social assistance delivery mechanisms affects climate risk-related vulnerabilities. The regression analysis intends to determine the best fit model that predicts the probability of having a low-risk index that is influenced by the efficacy indicators of social assistance programmes. The linear regression equation is as follows

$$y = \beta_0 + \sum_{k=1}^p \beta_k x_k + \varepsilon$$

Where

y : dependent variable

β_0 : intercept of regression model

β_k : slope of regression model, this is parameter of the kth independent variable

x_k : the kth independent variable

ε : error of regression model, where assumed identical, independent and normal distribution with mean zero and variance constant σ^2

Based on examination of the literature, two econometric models were proposed. The list of dependent and independent variables within the models are:

Model 1

This model attempts to assess the association between country-level vulnerabilities (represented by the vulnerability score y) and spending by the countries on different social assistance instruments (x). The countries for which published data on the model variables was available were considered for the analysis. In the analysis of model 1, 122 countries were taken into account (N=122).

Table 17. Dependent and independent variables for the regression model 1

Dependent variable	V=Vulnerability score (calculated from INFORM data)
Independent variables	<p>CCT = Spending on conditional cash transfer programmes as % of the country's GDP</p> <p>UCT = Spending on unconditional cash transfer programmes as % of the country's GDP</p> <p>SP = Spending on social pension programmes as % of the country's GDP</p> <p>SF = Spending on school feeding programmes as % of the country's GDP</p> <p>PW = Spending on public works programmes as % of the country's GDP</p> <p>FOOD = Spending on food and in-kind programmes as % of the country's GDP</p> <p>FW = Spending on fee waiver programmes as % of the country's GDP</p> <p>OTHER = Spending on other social assistance programmes as % of the country's GDP</p> <p>GDP-PC = GDP per capita ('000s US\$)</p>

Model 2

Model 2 analyses the relationship between the efficacy of social assistance programmes and the vulnerability score. The model considered vulnerability score as dependent variable (y), and efficacy indicators (coverage, benefit incidence, average transfer and adequacy) and financial indicators (spending on social assistance programmes) as independent variables.

Table 18. Dependent and independent variables for the regression model 2

Dependent variable	V=Vulnerability score (calculated from INFORM data)
Independent variables	<p>COV = % of people of the total extreme poor covered by the programme (coverage)</p> <p>BI = % share of the extreme poor population among other income segments covered by the programme (benefit incidence)</p> <p>AVGPT = Average per capita transfer held by the poorest quantile (US \$) (Average per capita transfer)</p> <p>BA = % share of the transfer amount in relation to the average income or consumption (benefit adequacy)</p> <p>SSA = Spending on social assistance programmes as % of the country's GDP</p>

3. List of sample countries included in the regression analysis of model 1

N=122

Very low-risk countries		Low-risk countries	
1. Belarus	1. Albania	15. Mauritius	
2. Czech Republic	2. Argentina	16. Moldova	
3. Estonia	3. Armenia	17. Mongolia	
4. Grenada	4. Botswana	18. Montenegro	
5. Hungary	5. Bulgaria	19. North Macedonia	
6. Kazakhstan	6. Cape Verde	20. Paraguay	
7. Kuwait	7. Chile	21. Romania	
8. Latvia	8. Costa Rica	22. Samoa	
9. Lithuania	9. Croatia	23. Saudi Arabia	
10. Poland	10. Dominica	24. Serbia	
11. Slovak Republic	11. Fiji	25. Seychelles	
12. Slovenia	12. Jamaica	26. Trinidad and Tobago	
13. Uruguay	13. Malaysia	27. Tunisia	
	14. Maldives	28. Uzbekistan	
Medium-risk countries			
1. Azerbaijan	15. Ghana	29. Russian Federation	
2. Benin	16. Guinea-Bissau	30. Rwanda	
3. Bolivia	17. Indonesia	31. Senegal	
4. Bosnia and Herzegovina	18. Jordan	32. South Africa	
5. Brazil	19. Kiribati	33. Sri Lanka	
6. Cambodia	20. Kyrgyz Republic	34. Tajikistan	
7. China	21. Lao PDR	35. Thailand	
8. Comoros	22. Lesotho	36. Timor-Leste	
9. Dominican Republic	23. Malawi	37. Togo	
10. Ecuador	24. Morocco	38. Ukraine	
11. El Salvador	25. Namibia	39. Vietnam	
12. Eswatini	26. Nicaragua	40. Zambia	
13. Gabon	27. Panama		
14. Georgia	28. Peru		
High-risk countries		Very high-risk countries	
1. Bangladesh	16. Liberia	1. Cameroon	
2. Burkina Faso	17. Madagascar	2. Central African Republic	
3. Burundi	18. Mali	3. Chad	
4. Colombia	19. Mauritania	4. Congo, Dem. Rep.	
5. Congo, Rep.	20. Mexico	5. Iraq	
6. Côte d'Ivoire	21. Myanmar	6. Mozambique	
7. Djibouti	22. Nepal	7. Niger	
8. Egypt, Arab Rep.	23. Pakistan	8. Nigeria	
9. Ethiopia	24. Papua New Guinea	9. Somalia	
10. Guatemala	25. Philippines	10. South Sudan	
11. Guinea	26. Sierra Leone	11. Sudan	
12. Honduras	27. Tanzania	12. Uganda	
13. India	28. Turkey		
14. Kenya	29. Zimbabwe		
15. Lebanon			

Annex 2: detailed results of the exploratory factor analysis for model 2

Exploratory factor analysis

The four variables; coverage, benefit incidence, average transfer and adequacy, were selected for the factor analysis.

- The Kaiser-Meyer-Olkin (KMO) measure was used to assess the sample adequacy. KMO value was 0.540, and it was significant ($p < 0.001$). Bartlett's Test of Sphericity value tests the association between the variables. The value was $\chi^2 = 53.108$ and it was significant ($p < 0.001$).
- The principal component analysis method of factor extraction was used and one factor was extracted, explaining 76.36% of the total variance. Results of the scree plot technique indicated extraction of two factors from the four variables.
- Values of communalities ranged between 0.620 and 0.854. Since all the factor load values of all six variables were greater than 0.5, all of them were retained.
- The initial components were rotated by applying the varimax technique with Kaiser normalisation.

Rotated component matrix with two factors is as presented below.

Table 19. Rotated component matrix of factor analysis

VARIABLE	FACTOR 1	FACTOR 2
Coverage	0.292	0.731
Benefit incidence	0.058	-0.878
Adequacy	0.94	-0.009
Average transfer	0.870	0.228

It is clear from the results of the rotation component matrix that variables, namely adequacy (0.94) and average transfer (0.870), have highly loaded in factor 1 and other variables, namely coverage (0.731) and benefit incidence (-0.878), have highly loaded in factor 2.

- Coverage and benefit incidence variables describe to what extent the social assistance programmes target the vulnerable populations. Hence, factor 1 can be named as 'target accuracy'.
- Adequacy, in relative terms, and average per capital transfer, in absolute terms, explain the volume of the benefits. Hence factor 2 can be named as 'benefit size'.

The component/factor score coefficient matrix is as shown in Table 20.

Table 20. Factor score matrix of factor analysis

VARIABLE	FACTOR 1 (TARGET ACCURACY)	FACTOR 2 (BENEFIT SIZE)
Coverage	0.063	0.524
Benefit incidence	0.178	-0.693
Adequacy	0.576	-0.156
Average transfer	0.504	0.037

The new factor variables, i.e. target accuracy and benefit size were considered to run the models, instead of the original four variables (coverage, benefit incidence, adequacy and average per capita transfer).

Annex 3: selecting sample countries for qualitative analysis

Because the central focus of the research is on climate risks and vulnerabilities, the selection of countries was based on the intensity of climate risks faced by each country. The INFORM Risk Index was applied as the criteria for shortlisting the countries.

Countries in the INFORM Risk Index were grouped into the following five categories: very low-risk, low-risk, medium-risk, high-risk and very high-risk (INFORM Report, 2020). A description of the risk categories is presented in Table 21.

Figure 13. Framework for the selection of social assistance schemes

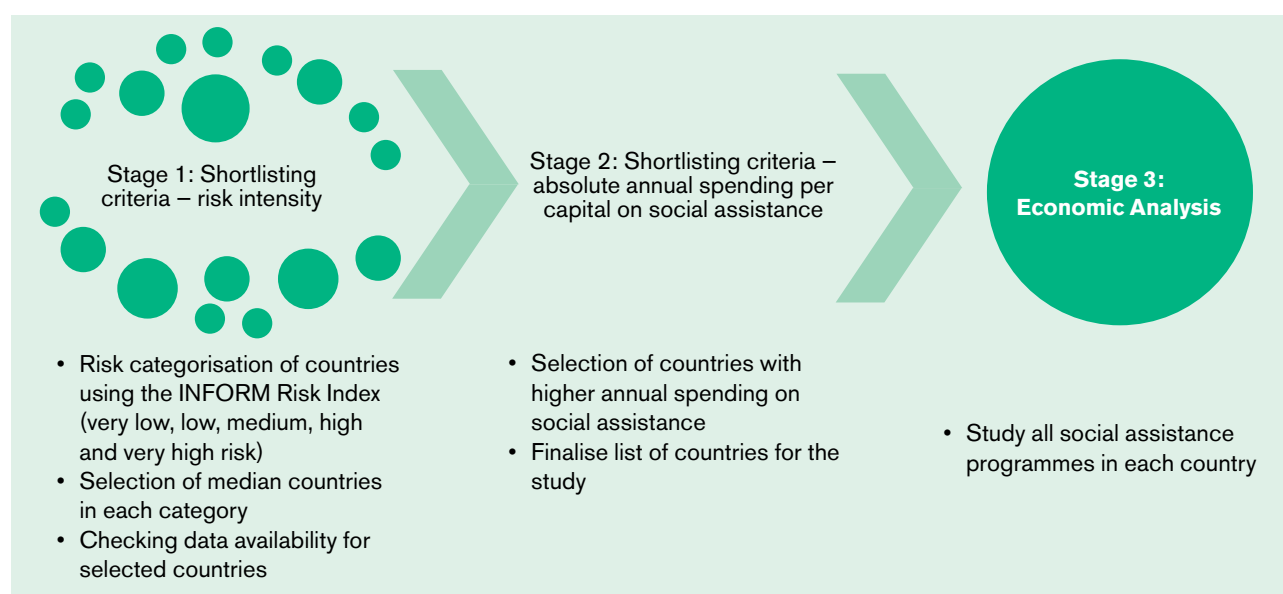


Table 21. INFORM Risk Index categories

SERIAL NUMBER	RISK CATEGORY	RISK RATING RANGE	NUMBER OF COUNTRIES	MEDIAN RISK RATING
1.	Very low	0–1.9	35	1.5
2.	Low	2–3.4	55	2.6
3.	Medium	3.5–4.9	51	4.1
4.	High	5–6.4	34	5.4
5.	Very high	6.5–10	16	7.3

Source: Calculated from INFORM Report (2020)

Of the countries grouped under each category, countries that had a median risk rating within the risk category were listed at the first selection level. The median metric was chosen to select a country representative from each risk category. This precluded the issue of selecting two countries from adjacent categories with overlapping characteristics. For example, if a country is listed last in the high category, as per risk rank, and another country is listed first in the very high category, they will most probably possess similar risk and vulnerability characteristics. The selection of these two countries will significantly affect the quality of the comparative analysis. The list of countries under each median rating is shared in Table 22.

Countries for which data on the effectiveness of social assistance schemes were not available were rejected and at this level, 11 countries were shortlisted across five risk categories. At this point, a second-level criterion, absolute annual spending on social assistance programmes per capita, was applied. Countries that spend the highest volume of funds per capita in each category received priority over others and were selected for case analysis. This criterion was applied assuming that programmes with higher annual expenditures will have greater coverage and impact. Selection of these programmes offered more rigour to the analysis. The list of countries shortlisted based on the second criterion is given in Table 23.

Table 22. List of countries with median risk rating under each risk category

SERIAL NUMBER	RISK CATEGORY	MEDIAN RISK RATING	LIST OF COUNTRIES	AVAILABILITY OF DATA FOR EFFICACY OF SOCIAL ASSISTANCE PROGRAMMES
1.	Very low	1.5	Ireland	Not available
			Latvia	Not available
			Poland (1.7)*	Available
			Kazakhstan (1.7)*	Available
2.	Low	2.6	Argentina	Available
			Fiji	Available
			Romania	Available
			Saudi Arabia	Not available
			Trinidad Tobago	Not available
3.	Medium	4.1	Benin	Available
			Ecuador	Available
			Vanuatu	Not available
4.	High	5.4	Columbia	Not available
			India	Available
			Korea	Not available
			Mauritania	Available
5.	Very high	7.3	Chad	Available
			Niger	Available
			Syria	Not available

Source: Calculated from INFORM Report (2020)

Note: * Since social assistance data for the median countries are not available, the countries with the nearest risk rating are selected (Poland and Kazakhstan).

Table 23. Selection of the countries using the second level criterion

SERIAL NUMBER	RISK CATEGORY	MEDIAN COUNTRY	ABSOLUTE ANNUAL (US \$) SPENDING PER CAPITA	STATUS OF SELECTION
1.	Very low	Poland	540	Selected
2.		Kazakhstan	420	
3.	Low	Argentina	290	Selected
4.		Fiji	105	
5.		Romania	230	
6.	Medium	Benin	76	Selected
7.		Ecuador	150	
8.	High	India	80	Selected
9.		Mauritania	40	
10.	Very high	Chad	12	Selected
11.		Niger	5	

In addition to countries selected through sampling, Ethiopia was purposively included in the list, because Ethiopia has been implementing a large-scale public works programme called the Productive Safety Net Programme (PSNP), which has integrated climate resilience components in its design. The final list of countries, after applying the risk category criteria, is presented in Table 24.

A list of key social assistance programmes implemented in the selected countries is presented in Table 25.

The selection methodology followed for the study ensures deeper inferential analysis integrating country-level dynamics and intra-country and inter-country comparative analysis of social assistance interventions. Risk-related data for each social assistance programme is rarely available in existing databases as the risk indices and indicators are generally calculated for a country. Hence, a careful selection of data sources and analytical indicators for which data is available will ensure reliable results.

Table 24: Final list of countries selected for qualitative analysis

SERIAL NUMBER	COUNTRY	INFORM RISK CATEGORY	INFORM RISK INDEX	ABSOLUTE ANNUAL (US \$) SPENDING PER CAPITA ON SOCIAL ASSISTANCE
1.	Poland	Very low risk	1.5	540
2.	Argentina	Low risk	2.6	290
3.	Ecuador	Medium risk	4.1	150
4.	India	High risk	5.4	80
5.	Ethiopia	High risk	6.3	20
6.	Chad*	Very high risk	7.3	12
7.	South Sudan*	Very high risk	8	100

*Note: South Sudan was additionally selected under the 'very high-risk' category since data on some efficacy indicators such as coverage, benefit incidence, adequacy and average per capita ratio were not available for the social assistance programmes of Chad. On the other hand, Chad was not rejected out of the list since data on spending on social assistance programmes of South Sudan was not available. Hence, both the countries were retained to draw data of all efficiency indicators for the 'very high-risk' category.

Table 25. Social assistance programmes in the countries selected for the case analysis

SL. NO.	NAME OF THE SOCIAL ASSISTANCE PROGRAMME	TYPE OF SOCIAL ASSISTANCE PROGRAMME	NUMBER OF INDIVIDUAL BENEFICIARIES	DATA REFERENCE YEAR
Country: Poland (very low-risk category)				
1.	Child Allowance 500+	Unconditional cash transfer	3,820,000	2016
2.	Food benefit (in kind and cash)	Food aid and in kind	554,400	2013
3.	School feeding	School feeding	730,000	2011
4.	Direct job creation	Public works	9,070	2013
5.	Health premium for caregivers	Fee waivers	188,650	2013
Country: Argentina (low-risk category)				
6.	Asignación Universal por Hijo para la Protección Social	Conditional cash transfer	3,969,777	2017
7.	Pensión no contributiva por discapacidad	Social pension	1,073,291	2017
8.	Plan Nacional de Seguridad Alimentaria	Comedores escolares	1,687,785	2016
9.	Plan de Empleo Comunitario (PEC)	Public works	187,282	2015
Country: Ecuador (medium-risk category)				
10.	Bono de Desarrollo Humano	Conditional cash transfer	8,347,320	2014
11.	Bono matrícula para la eliminación del aporte voluntario	Social pension	3,015,199	2010
12.	Programa de Alimentación Escolar	School feeding	293,303	2014
13.	Mi Primer Empleo	Public works	1,222	2013
14.	Programa Textos Escolares	Fee waiver	6,206,416	2015
Country: India (high-risk category)				
15.	Janani Suraksha Yojana	Conditional cash transfer	1,946,858	2016
16.	Indira Gandhi National Old-Age Pension Scheme (IGNOAPS)	Social pension	24,243,753	2016
17.	Public Distribution System (PDS)	Food aid and in kind	232,000,000	2016
18.	School feeding	School feeding	104,500,000	2014
19.	Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	Public works	115,400,000	2017
Country: Chad (very high-risk category)				
20.	Projet ECHO6 – CARE	Conditional cash transfer	11,833	2016
21.	Protection awaiting solutions of Sudanese refugees settled in eastern Chad	Unconditional cash transfer	308,862	2016
22.	Food aid to vulnerable/food-insecure households	Food aid and in kind	422,457	2016
24.	Food Assistance for Assets (Volunteer cooks) – WFP	Public works	10,670	2017

Source: ASPIRE (2017)

Abbreviation and acronyms

ASP	Adaptive social protection
ASPIRE	The Atlas for Social Protection Indicators of Resilience and Equity
BCR	Benefit-cost ratio
CCT	Conditional cash transfers
DBT	Direct benefit transfer
EDI	Economic Dependency Index
FW	Fee waivers
GDP	Gross domestic product
GI	Gini Index
GII	Gender Inequality Index
HDI	Human Development Index
IMR	Infant mortality rate
INFORM	Index for Risk Management
LDC	Least developed country
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MPI	Multidimensional Poverty Index
ODA	Official Development Assistance
PDS	Public Distribution System
PPP	Purchasing power parity
PSNP	Productive Safety Net Programme
PW	Public works
SF	School feeding
SP	Social pensions
UBI	Universal basic income
UCT	Unconditional cash transfers
UNICEF	United Nations Children's Fund

This paper attempts to analyse the efficiency and effectiveness of the various social protection delivery mechanisms with reference to climate resilience, and also examines the sufficiency of social protection finance in meeting climate resilience and sustainable development outcomes.

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