International Labour Organization

Social insurance and climate change in Indonesia

Implications for Adaptive Social Protection ambitions

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Photo credit: Feri Latief/ILO

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Abbreviations and acronyms

Bappenas	Badan Perencanaan Pembangunan Nasional (Ministry of National Development Planning)
BMKG	Badan Meteorologi, Klimatologi, dan Geofisika (Meteorology, Climatology and Geophysics Agency)
BNBP	Badan Nasional Penanggulangan Bencana (National Board for Disaster Management)
BPJS Employment	Badan Penyelenggara Jaminan Sosial Ketenagakerjaan (Social Security Agency for Employment)
BPS	Badan Pusat Statistik (Statistics Indonesia)
DJSN	Dewan Jaminan Sosial Nasional (National Social Security Council)
GDP	Gross Domestic Product
IPCC	Intergovernmental Panel on Climate Change
JHT	Jaminan Hari Tua (old-age savings)
JKK	Jaminan Kecelakaan Kerja (employment injury insurance)
JKM	Jaminan Kematian (death benefit scheme)
JKN	Jaminan Kesehatan Nasional (national health insurance)
JP	Jaminan Pensiun (pension scheme)
JKP	Jaminan Kehilangan Pekerjaan (unemployment insurance)

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Foreword

The Government of Indonesia has made strides in decreasing poverty and vulnerability and has aimed to achieve high-income status and reduce poverty to nearly zero. To attain this, it will be important to prevent people from being pushed into poverty, and to maintain an adequate standard of living through improving conditions for employment. It will also mean that Indonesia's social security system will have to be gradually adapted as the country undergoes demographic and labour market changes exacerbated by climate change.

Indonesia is ranked at a high level of risk of climate-related hazards, with Papua, Maluku and Central Sulawesi identified as the provinces with the highest overall risk in the country. Certain sectors such as agriculture, fishing and forestry, tourism, wholesale and retail, restaurants and hotels, mining, and utilities are disproportionately affected by climate change impacts, with hazards such as floods, sea level rise, coastal flooding, and droughts regularly impacting workers employed in these industries.

Climate-related hazards can result in disruption of production and service activities, as well as physical damage to workplaces, rendering workers jobless, or causing disruptions to regular income. In addition to traditionally vulnerable groups such as the elderly, women, children, persons with disabilities and low-income earners, the impacts of climate change also affect the middle class, with women, non-wage and self-employed workers becoming particularly vulnerable to job and income loss when affected by climate-related hazards. However, government support or humanitarian aid in the aftermath of disasters are mostly targeted at the poorest and may not provide protection to laid off or injured workers.

Acknowledging the challenges expressed above, this report presents an examination of social insurance within the Adaptive Social Protection (ASP) approach, which seeks to bring together social protection, climate change adaptation and disaster risk management sectors to provide comprehensive protection to all in the face of climate risks. The ASP approach traditionally puts more weight on social assistance or non-contributory schemes over social insurance. This report adds value to discussions on the ASP approach as it explore the role of social insurance or contributory schemes. Social insurance schemes can be recognized as part of the strategy mix that is taken to manage such risks, especially to fill the coverage gap for ordinary residents, especially middle-class workers. As Indonesia discusses ASP, it is an opportune moment to take stock of the potential of social insurance schemes such as the pension scheme (JP), employment injury insurance scheme (JKK) and unemployment insurance scheme (JKP) in protecting workers during and after hazards, complementing social assistance schemes that primarily target people in (extreme) poverty.

I hope this report will contribute to more active policy discussions on climate change and social insurance.

Michiko Miyamoto
ILO Country Director for Indonesia and Timor-Leste

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Executive summary

Indonesia is ranked in the top-third of countries in terms of climate risk, with high exposure to all types of flooding and to extreme heat (World Bank and ADB 2021). The intensity of these hazards is predicted to worsen, as will the size of the population exposed to such hazards. Indonesia is also specifically affected by sea level rise, ranking fifth in the world for the number of people who inhabit vulnerable lower-elevation coastal zones (Bharadwaj and Shakya 2021). Climate change might also have impacts on water availability, disaster risk management, urban development (particularly in coastal zones), and health and nutrition, with implications for poverty and inequality (World Bank and ADB 2021). Increased exposure to a number of climate-related risks will result in higher levels of loss and damage and reduced purchasing power of the population, resulting in loss of revenues for businesses and government.

Under Indonesia's G20 presidency, social protection recently received more attention due to its potential to address and manage climate risk, as well as to ensure people's needs are met throughout a Just Transition to an environmentally sustainable economy and society for all. In light of increasing challenges, such as poverty, inequality and climate change, impacting people as well as social protection systems overall, this report examines social insurance in Indonesia within the framework of Adaptive Social Protection (ASP) to provide comprehensive protection to all in the face of climate risks. In Indonesia, the social protection focus in the context of climate risk to date has mostly been on social assistance or non-contributory programmes, such as cash transfer schemes narrowly targeting households in poverty. Also internationally, while there have been many conferences and discussions concerning ASP, none of them focused on the role of social insurance.

The potential role of social insurance not only includes immediate preparedness and response to climate-related shocks in the short term, but also longer-term adaptation, mitigation of an increase in climate change risks and facilitation of a Just Transition to an environmentally sustainable economy and society. Investment governance of social insurance funds must be reviewed to ensure that these funds no longer invest in carbon-intensive industries whose emissions increase climate risks – and instead minimize the climate change and transition risk in their investment portfolios. In case of climate-related shocks, wage subsidy schemes could help prevent unemployment, just as they did during the COVID-19 crisis. Unemployment insurance schemes could provide unemployed workers with temporary and partial income security, help them return to work, facilitate further skills development if necessary, and eventually contribute to facilitating a Just Transition of workers from emission-intensive industries to other sectors.

Among the wide range of possible roles of social insurance, this report aims to explore the potential of social insurance schemes in addressing climate risk and minimizing the impacts of related shocks in Indonesia, and how these schemes can be expanded to provide affected workers with better protection through temporary adjustments in parameters such as benefits and qualifying conditions, as well as adjustments in operational capacity. The study will focus on three social insurance schemes of BPJS Employment [1]:

i. unemployment insurance scheme (Jaminan Kehilangan Pekerjaan, or JKP);
ii. employment injury insurance scheme (Jaminan Kecelakaan Kerja, or JKK); and
iii. pension scheme (Jaminan Pension, or JP).

This study was conducted based on literature reviews complemented by bilateral interviews and discussions with government institutions as well as tripartite consultations with workers, employers and the Government. The report consists of sections on climate change-related shocks and stresses affecting Indonesian workers and employment, an overview of the three social insurance schemes, international practices on temporary

1 BPJS Employment (or Badan Penyelenggara Jaminan Sosial Ketenagakerjaan) is short for the Social Security Agency for Employment.

expansions in times of crisis, and the potential applications of such expansion measures to the three schemes in Indonesia.

From the reviews of international practices, several patterns of temporary or permanent expansion measures were identified. These include:

i. provision of temporary top-ups to insured and entitled participants (vertical expansion);
ii. extension of mandatory coverage by reforming permanent policy design (horizontal expansion);
iii. use of existing payment and communication mechanisms (piggybacking);
iv. temporary relaxation of contribution requirements, eligibility requirements or any other changes in parameters to expand protection (other adaptive measures); and
v. introducing new programmes that are aligned in addressing needs of affected workers (alignment).

Overall, the following general recommendations are made:

1. Indicators to activate temporary expansion of social insurance schemes may be determined. Foundational research is needed for understanding climate risks, the sources and skills of available forecast data, group specific needs and vulnerabilities, impact pathways, and the projected duration and intensity of the hazards. Such analysis on climate risks will help the Government identify indicators to declare an emergency and to activate temporary expansion measures to the social insurance schemes.
2. The permanent design of social insurance schemes must be improved. The current policy designs for the JKK, JP and JKP schemes have several limitations concerning coverage, adequacy and financial sustainability. the ILO has provided recommendations for improvements in separate reports.
3. Workers, employers and the Government, possibly through existing tripartite mechanisms, may discuss, identify and agree on temporary expansion measures for these social insurance schemes; indicators to trigger the declaration of an emergency and therefore trigger the predetermined expansion measures; and any other issues necessary for establishing legal grounds in laws and regulations to implement such arrangements.
4. Under current regulations, the three social insurance schemes are set to be reviewed every two to three years. However, it is not clear whether the Government implements actuarial valuations within this timeframe, because results are not publicly available. Actuarial valuations should be regularly conducted. Progressively, the periodic reviews should not only consider coverage, adequacy and financial sustainability, but also the projected impacts from climate change-related risks (comprehensiveness). This analysis within the actuarial valuation report or as a complement should use sensitivity analysis and scenario testing as tools to assess such impacts and to summarize them. Recommendations in response to such risks (such as the need to increase contribution rates) should be set out clearly in the report.
5. As the temporary expansion of the schemes may require tax funds, it is necessary to consider the fiscal envelope, the risk financing strategy and the overall priorities of the Government.
6. Strengthening communication, promotion and marketing, and concrete messaging around the benefits of the respective social insurance schemes are necessary to improve uptake rates, along with improving implementation components such as registration, payments and grievance redressal. Strengthened communication will improve knowledge of workers and residents on how social insurance schemes could help them in time of crisis.
7. As the Social and Economic Registry is being developed, it may be useful to explore ways in which data can be interoperable among different ministries, especially BPJS Employment through the Ministry of Manpower, and among external stakeholders like humanitarian actors and donors intending to undertake disaster risk management and/or response. Provisions could be made to share data on request to help target workers better.

Concerning the three specific schemes, a number of possible temporary measures to improve protection in disaster affected areas are discussed in the report. Major highlights are as follows:

1. For all three schemes, temporary adaptive measures in policies and operations may help improve protection. Some of the common expansion measures include: top-ups or extension of benefits duration; reschedule or exemption of contribution payments during or after the disaster; relaxation of eligibility requirements to increase the number of beneficiaries; and improving administrative capacity to ensure accessibility to the benefits.
2. The JP scheme is designed to benefit older persons, persons with disabilities due to non-work-related incidences and survivors of the deceased. Some countries top up or pay these benefits in advance to those affected by climate-related hazards. This requires easy access through necessary administrative measures, particularly in disaster-prone and -affected areas.
3. The JKK scheme is designed to provide for workers affected by occupational diseases, injuries and death through a cash benefit, medical care, rehabilitation and return-to-work support. It must be ensured that the scheme also covers work injuries or death due to climate-related shocks.
4. The JKP scheme is well-placed to prolong income compensation when a worker is unable to find a job due to unforeseen circumstances following a disaster. Covered contingencies may explicitly include unemployment due to climate-related hazards. For example, under the current law and regulation, it is not clear whether an insured worker will be entitled to cash benefits if they resign from wage work that has been suspended until further notice because the workplace is destroyed (e.g. by a flood). A temporary expansion of benefit amount and duration may help increase protection of affected workers, while relaxing requirements for contributions and continuation of benefits during disaster periods will contribute to temporarily expanding beneficiaries. Moreover, providing a relocation allowance, lodging allowance, transport or moving allowance, or transport allowance for attending job interviews in other places, as well as a new employment retention scheme can be considered in the future.
5. Major differences between climate risk management measures and COVID-19 pandemic response measures would be the timespan involved and the populations affected. The number of insured members affected by each shock may be smaller for disaster responses, which may result in lower budgetary implications than the pandemic, especially since most of the shocks and impacts will be localized in nature with limited numbers of casualties. However, climate-related shocks may happen more frequently and with different levels of severity, and disaster response measures must be generally put in place immediately (that is, within a few days to weeks). In this regard, accumulated social insurance funds and predetermined and transparent qualifying conditions will help insured members immediately self-target themselves and claim benefits. While the Government prepares for ad hoc tax-funded measures, budget approvals and operations, social insurance schemes could help insured members immediately by following business-as-usual procedures.
6. Any of these adjustments must be implemented with actuarial recommendations and must be monitored and assessed by regular actuarial valuations. Cost implications may vary by frequency and severity of disasters, the number of insured members in affected regions, and the adaptive measures taken. It is also noted that the ILO has recommended to improve the benefits and financial sustainability of the permanent policy designs for the three schemes (Plamondon, Phan and Brimblecombe, forthcoming; Landry and Brimblecombe 2021; ILO 2017). Therefore, temporary adaptation measures must be discussed while considering improvements to the permanent policy design.

These discussion points could contribute to the development of the 2025–2045 National Long-Term Development Plan (Rencana Pembangunan Jangka Panjang Nasional, or RPJPN) and to discussions on Adaptive Social Protection (ASP) in Indonesia.

1. Introduction

Human activities are causing climate change and increasing extreme climate events, including heatwaves, heavy rainfall, and droughts, such that they are becoming more frequent and severe. Climate impacts and risks are becoming increasingly complex and more difficult to manage, affecting every region on Earth, in multiple ways (IPCC 2022). Indonesia, the world's largest archipelagic state (Wingqvist and Dahlberg 2008), is also the fourth-most populous country in the world, with a large number of inhabitants exposed to climate change induced hazards. It ranks in the top-third of countries in terms of climate risk, with high exposure to all types of flooding and to extreme heat (World Bank and ADB 2021).

Multiple climate-related hazards are expected to occur simultaneously as climate risks interact with other threats to compound the overall risk (IPCC 2022). Compounding risks are expected to cascade across sectors and regions in Indonesia as well, with climate change having impacts on water availability, disaster risk management, urban development, particularly in the coastal zones, and health and nutrition, with implications for poverty and inequality (World Bank and ADB 2021).

The critical need to address the social, economic, and environmental impacts of climate change have warranted a search for effective tools and mechanisms that can be used to scale up for short-term emergencies and prepare for long-term resilience building. Social protection is one such strategic tool that can be used for climate risk management (Costella et al. 2021). The ILO (2017a) defines social protection as a "set of policies and programmes designed to reduce and prevent poverty and vulnerability throughout the life cycle". According to the ILO World Social Protection Report 2014/15 the concepts of "social security" and "social protection" are used interchangeably by the ILO, and in this report, we use the term "social protection" as an alternative expression for "social security" (ILO 2014).

Social protection programmes aim to provide benefits, whether in cash or in kind, to secure protection from:

i. lack of work-related income (or insufficient income) caused by sickness, disability, maternity, employment injury, unemployment, old age, or death of a family member;
ii. lack of (affordable) access to healthcare;
iii. insufficient family support, particularly for children and dependent adults; and
iv. general poverty and social exclusion (ILO 2014).

The ILO Social Security (Minimum Standards) Convention, 1952 (No. 102), prescribes that protection from these risks can be ensured through universal social insurance and social assistance schemes.

With a population of 270.20 million according to the 2020 national census (Indonesia, BPS 2021, 9), Indonesia is one of the major emerging markets in South-East Asia. In 2021, 10.1 per cent of the population in Indonesia lived below the national poverty line, with 2.9 per cent of the employed population below US$1.90 purchasing power parity a day (ADB 2022). Indonesia has made significant progress in poverty reduction, decreasing poverty rates by more than half since 1999, to under 10 per cent in 2019 before the COVID-19 pandemic (World Bank, n.d.-a), and much of this progress can be attributed to interventions like social protection. Over the years, Indonesia has developed a strong social protection system with social assistance programmes, including, for example:

- conditional cash transfers (Program Keluarga Harapan, or PKH), education cash transfers (Program Indonesia Pintar), and food assistance (Sembako);

- social insurance programmes in the form of health insurance (Jaminan Kesehatan Nasional), employment injury insurance (Jaminan Kecelakaan Kerja, or JKK), pension (Jaminan Pensiun, or JP), unemployment insurance (Jaminan Kehilangan Pekerjaan, or JKP) and death benefit scheme (Jaminan Kematian, or JKM); and
- labour market interventions such as cash-for-training or pre-employment card programme (Kartu Pra Kerja) and wage subsidy assistance (Bantuan Subsidi Upah) [2].

But with the risks faced by Indonesians changing in terms of increasing frequency and magnitude – specifically (natural) disaster risks and risks induced by climate change – there is an increasing need to provide a comprehensive package of non-contributory and contributory social protection schemes and services. If social protection schemes are to go beyond protecting people from life-cycle risks, poverty and socio-economic vulnerability, and additionally protect against climate risks and shocks, then these systems will have to be strengthened and adapted to anticipate, prepare for and address future shocks and stresses. The Adaptive Social Protection (ASP) approach seeks to coherently address these objectives by enabling coordination among social protection, disaster risk management and climate change adaptation sectors, in the context of natural and climate-related risks (Germany, GIZ 2020). Recognizing its needs, the Indonesian Government has included ASP in the National Medium-Term Plan 2020–24 (RPJMN) and is currently engaged in developing an ASP strategy structured around four building blocks:

i. Institutional arrangements;
ii. Data and information;
iii. Programmes and delivery systems; and
iv. Adaptive financing.

The third building block on programmes seeks to integrate schemes and measures across sectors and identify a mix of instruments that can achieve the highest impact with limited financial resources. While social assistance programmes such as PKH are already discussed in the ASP strategy, the discussion around use of social insurance for ASP in Indonesia has been limited (Germany, GIZ 2020).

In this study, we aim to bridge this gap and initiate a discussion on the potential role of social insurance for climate change in Indonesia. We take a closer look at the nature and impacts of climate risks faced by the island State, and review whether the existing social insurance schemes – particularly employment injury insurance (JKK), pension (JP) and unemployment insurance (JKP) – can potentially be used and adapted into feasible and effective options to reduce the climate-related risks to workers in formal employment. The report has been written based on an in-depth desk review of academic and grey literature, complemented by inputs from social protection specialists and national actors including BPJS Employment [3], National Board for Disaster Management (BNPB) and the Ministry of National Development Planning (Bappenas). It is expected that the report will provide insights into key entry points for including and leveraging social insurance schemes as part of the comprehensive ASP strategy of Indonesia.

It is noted that we aim to provide possible analytical frameworks to discuss what roles the existing social insurance schemes could play to protect workers and their families from climate-related shocks, and how these schemes could become more effective by temporary expansion in times of crisis. We focus on identifying patterns of temporary expansion measures learned from international practices, categorizing them to develop an analytical framework, and discussing how these measures could be implemented within the existing social insurance schemes in Indonesia. Further analysis and discussion will be required to conclude any recommendations on policy reforms. In particular, any measures must follow actuarial recommendations.

2 While BPJS Employment operates another old age savings scheme (Jaminan Hari Tua, or JHT), this has not been included here since it does not meet the definition of a social insurance scheme as prescribed by the ILO.

3 BPJS Employment (or Badan Penyelenggara Jaminan Sosial Ketenagakerjaan) is short for the Social Security Agency for Employment.

2. Climate change in Indonesia

2.1. General climate

Comprising a total of 17,000 islands, Indonesia generally enjoys a tropical rainforest climate, with average temperatures ranging from 23 degrees Celsius in the higher mountains to 28 degrees in the coastal plains. Rainfall occurs predominantly during the wet season that lasts from November to April (with a rainfall peak in January and February), and ranges between 1,800 and 3,200 mm for lowlands, increasing up to 6,000 mm in some mountain areas (Netherlands, Ministry of Foreign Affairs, 2019).

2.2. Climate change trends

According to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), which provides estimates for future temperature and precipitation, Indonesia is expected to have a consistent warming trend for all emission scenarios (World Bank and ADB 2021). Warming projections suggest a significant increase in the frequency of days with temperatures >30°C. Significantly higher rates of warming are predicted in Indonesia's inland areas (World Bank, n.d.-b; World Bank and ADB 2021). For example, under all emissions pathways, the likelihood of experiencing conditions that would historically be classified as a heatwave increases dramatically by the 2080s and reaches approximately 71 per cent under the RCP6.0 [4]. This means inland cities such as Pekanbaru, Jambi and Palembang on the island of Sumatra, and Palangkaraya and Samarinda in the province of Kalimantan will face intense warming. These regions of Indonesia are also where economic activities are highly concentrated, and therefore this projected warming could impact sectors such as: oil and construction; manufacturing (coal, palm oil, rubber, mining products); trading (fertilizer, cement, gas and oil, rubber), service, transportation, and tourism. Such warming can be expected to have a considerable impact on the livelihoods of workers engaged in these sectors as extreme temperatures can cause productivity loss, delays in construction, and increases in the cost of energy and agricultural goods and services, impacting industries using such commodities and contributing to overall cost increase and loss of cost efficiency.

Compared to temperature forecasts, precipitation predictions for Indonesia are uncertain. Precipitation trends are expected to show a likely increase in the western and southern areas, while a reduction in rainfall is predicted for the southern islands. Overall, there is likely to be an increase in intensity for extreme rainfall events (World Bank 2021).

2.3. Climate-related[5] hazards

As part of the national discussions on ASP, a risk assessment across regions and provinces of Indonesia was conducted in 2022. It mapped the three components of risk, namely hazard, exposure and vulnerability, across the provinces to inform important areas for developing ASP in Indonesia. The findings show that interventions should be targeted at Papua, Maluku and Sulawesi, as they are most at risk (Sett et al. 2022).

4 RCP, or Representative Concentration Pathway, is a greenhouse gas concentration trajectory adopted by the IPCC and defined by their total radiative forcing pathway and level by 2100 (total radiative forcing being the cumulative measure of human emissions of greenhouse gases from all sources expressed in Watts per square meter). The Fifth Assessment Report described four different 21st century pathways of greenhouse gas emissions and atmospheric concentrations, air pollutant emissions and land use: they include a stringent mitigation scenario (RCP2.6) to keep global warming likely below 2°C above pre-industrial temperatures, two intermediate scenarios (RCP4.5 and RCP6.0), and one scenario with very high greenhouse gas emissions (RCP8.5). In the Sixth Assessment Report (2022), new Shared Socioeconomic Pathways have been put forth that the world could take, which are scenarios of projected socioeconomic global changes up to the year 2100 ranging from a low of 3.1 degrees to a high of 5.1 degrees Celsius above pre-industrial levels.

5 The term "climate-related" here includes hazards that originate either from natural disasters (floods, cyclones) and/or from climate change (sea level rise).

However, no province in general has a low risk level, and therefore ASP aspirations should be designed to be incremental and ultimately cover the whole country in successive phases. Based on factors that can influence the success of ASP, Java and Bali were identified as good starting points for ASP interventions, given their comparative advantage in terms of institutional capacity and stakeholder engagement.

The level of risk from climate change depends on the hazard proneness of a region, the exposure of the population and infrastructure to the hazards, and to the existing vulnerabilities of the population exposed. Based on the Hazard, Exposure and Vulnerability Assessment (HEVA) by Sett et al. (2022), the Indonesian provinces identified as most hazard prone, exposed and vulnerable, are presented in table 1 below.

▶ Tabel 1. Most at risk (hazard prone, exposed and vulnerable) Indonesian provinces

Most hazard prone	Most exposed	Most vulnerable
Aceh, East Nusa Tenggara, East Java, North Sulawesi, Central Java	Central Sulawesi, Gorontalo, Maluku North Maluku	Papua, West Papua, West Kalimantan, Riau, Maluku

The level of risk from different climate-related hazards varies from province to province based on a combination of these factors. Indonesia is affected by various types of natural hazards, including floods, droughts, earthquakes, tsunamis and volcanic eruptions. It also faces weather-triggered land- or mudslides and wildfires (Indonesia, Bappenas and BNPB 2018). According to the INFORM Risk Model of the European Commission's Disaster Risk Management Knowledge Centre (n.d.-a), Indonesia ranks 48th out of 191 countries in terms of natural hazard risk. The INFORM model comprises three dimensions of risk, namely hazards and exposure, vulnerability, and lack of coping (that is, adaptive) capacity. Building on the United Nations Office for Disaster Risk Reduction definition of risk as a function of hazard, exposure and vulnerability, the INFORM Risk Model integrates the aspects of physical exposure and physical vulnerability into the hazard and exposure dimension; the aspect of fragility of the socio-economic system translates into the vulnerability dimension; and the lack of resilience to cope and recover is denoted by the lack of coping capacity dimension (European Commission, DRMKC, n.d.-b).

▶ Tabel 2. INFORM 2023 Country Risk Profile for Indonesia

Droughts	Cyclones	Earthquakes	Floods	Tsunamis	Epidemics	Rank
3	6.1	8.9	8.1	9.7	7	48

As seen in table 2, Indonesia is at the highest risk from tsunamis and earthquakes, owing to its location within a zone of high seismic activity and plate movements. Floods, epidemics and cyclones are the other important hazards, followed by droughts.

Due to climate change, Indonesia is also becoming increasingly vulnerable to sudden-onset events such as extreme flash floods, and slow-onset disasters such as sea level rise, shifts in rainfall patterns and increases in temperature (Netherlands, Ministry of Foreign Affairs 2019). In the following section, the hazards that are predicted to be worsened due to climate change are discussed in greater detail. Tsunamis [6], earthquakes, volcanic eruptions and epidemics are not discussed here, because of the predominantly geophysical nature of the first three hazards and because limited literature attributes these hazards directly to climate change in Indonesia. While there has been limited research done on how these hazards impact workers in Indonesia, the study includes documented impacts on sectors and livelihoods from other countries facing similar hazards, with the assumption that similar implications can be expected in the Indonesian context.

6 Here tsunamis are differentiated from tidal surges, as they refer to massive movements of water that are caused by seafloor movements or earthquakes at plate boundaries.

2.3.1. Floods

Flooding in Indonesia is among the most serious and dangerous of all climate risks, resulting in loss of lives and livelihoods, physical damage to property and infrastructure, and economic losses. According to the Aqueduct Global Flood Risk Country Rankings by Population Affected in 2015, Indonesia ranked 6th out of 163 countries, with an annual average of 635,470 people exposed to floods (Luo, Winsemius, and Ward 2015). High waves, which historically have occurred only once every ten years, are now predicted to occur every four to ten years by the end of the century, even under lower emissions scenarios, or RCP4.5 (Wang, Feng, and Swail 2014). By 2030, approximately 5.5 million to 8 million people are forecasted to be living in the floodplain exposed to these high waves and previously once in a century coastal floods resulting from storm surges (World Bank and ADB 2021).

In a study on flood risk and adaptation strategies in Indonesia under increased climate change and urban expansion by Muis et al. (2015), it was found that climate change could magnify coastal flood risk by 19–37 per cent by 2030. With about 18 per cent of the total population inhabiting low elevation coastal zones, Indonesia has one of the largest global populations exposed to coastal flooding (World Bank 2021), and this is set to increase to more than 62 million by 2030 (Neumann et al. 2015). Flooding and heavy rainfall events in Indonesia also result in cascading risks triggering hazards such as landslides (Sett et al. 2022).

2.3.2. Cyclones

Indonesia is affected by strong winds and heavy rainfalls due to tropical cyclones, which move in from the south-eastern Indian Ocean between January and April and from the eastern Pacific between May and December. Southern Indonesia, being a conducive hotspot where cyclones tend to grow in the southern hemisphere, witnessed 51 tropical cyclones during 1983–2017 (Mulyana et al. 2018). Even though Indonesia generally does not lie directly in the path of these cyclones due to its equatorial location (World Bank 2021), these once-rare tropical cyclones are happening more often according to the Indonesia's weather agency (BMKG), while exposed populations remain underprepared (*Reuters* 2021).

In 2021, tropical cyclone Seroja affected Indonesia, triggering devastating floods and landslides in the West Nusa Tenggara and East Nusa Tenggara provinces. According to Indonesia's weather agency, rising sea temperatures due to global warming were responsible for tropical cyclone Seroja (Yulisman 2021). Increased sea-surface temperatures associated with climate change are projected to increase tropical cyclone intensity (World Bank 2021).

2.3.3. Droughts

Droughts in Indonesia frequently coincide with El Niño events, resulting in reduced average rainfall and limited water storage capacity, while exposing large regions to drought and fire (World Bank, n.d.-b). Climate change projections indicate that droughts will increase in frequency and severity, resulting in more forest fires, as was seen in October 2019 following consistently dry conditions between June and November of that year (World Bank 2021).

In the future, droughts are projected to severely affect southern Indonesia, especially Java, Bali, Sulawesi and Maluku, due to an expected decrease in rainfall. Five of Java and Bali's seven provinces already have high drought levels, making such expected increases particularly concerning. These regions also have a high population density, and this will result in water scarcity challenges (Sett et al. 2022).

2.3.4. Sea level rise

Indonesia has a coastline of 81,000 kms, with about 42 million Indonesians living on low-lying coastal zones at less than 10 metres above the sea level (United States, USAID 2017). This makes Indonesia rank fifth in the

world for the size of its population who lived exposed to the slow onset disaster of sea level rise (Bharadwaj and Shakya 2021). Sea level rise is projected to submerge 2,000 of the country's smaller islands by 2050, and by 2100, 5.9 million people are predicted to be impacted by annual coastal flooding (United States, USAID 2017).

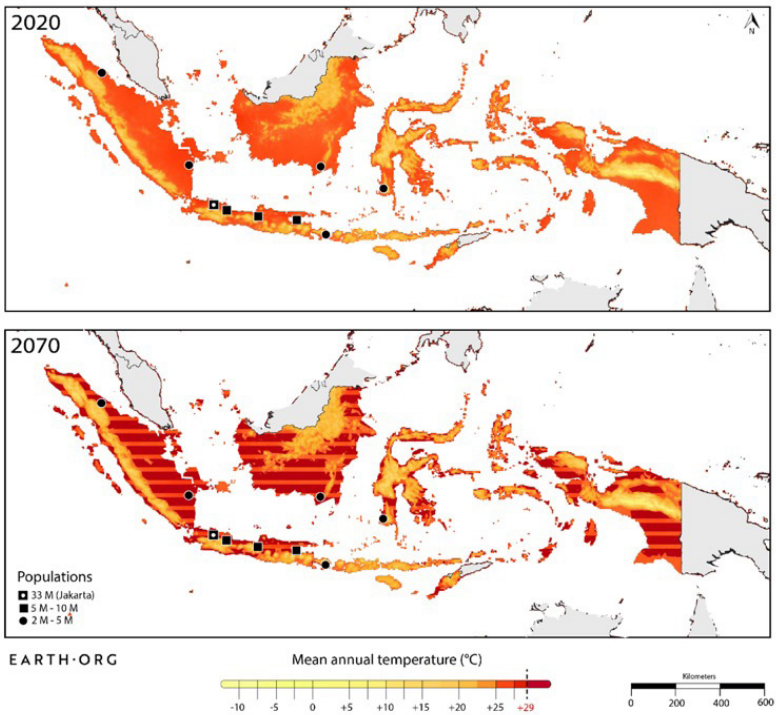
A 1 metre rise in sea level could inundate 405,000 hectares of land, greatly reducing Indonesia's territory by submerging the smaller islands. The densely populated areas of Jakarta and Bekasi are also at high risk, given that a 50 cm rise in sea level, combined with land subsidence in Jakarta Bay, could permanently inundate those areas, impacting 270,000 people who currently reside there (World Bank, n.d.-b). The coastline of Indonesia is also home to a rich coastal forest and mangrove cover, which are at risk of inundation as well.

Indonesia's National Mid-term Development Plan (2020–2024) states that hydrometeorological disasters like rainfall and flood events are expected to intensify in the coming years due to climate impacts. Between 2016 and 2018, approximately 3,000 villages located along the coastline experienced flooding. Increased rainfall patterns during the monsoons, combined with the annual sea level rise is predicted to increase the severity of flooding in coastal areas (Bharadwaj and Shakya 2021).

2.3.5. Heat waves

Geographically, Indonesia's position between the Indian and Pacific oceans makes it vulnerable to heat hazards, with models indicating that even with 1.5 degrees of warming, major cities in South and East Asia will be experiencing heat stress for the first time (Mora et al. 2017).

▶ Figure 1. Appearance of mean annual temperatures above 29°C in Indonesia by 2070



Source: Mulhern 2020a.

According to a study conducted by Xu et al. (2020), many parts of Indonesia may be exposed to mean annual temperatures of above 29 degrees consistently by 2070, which is experienced only in about 0.8 per cent of the world today. As seen in figure 1, calculations made by Mulhern (2020a) predict that up to 215 million people in Indonesia will be affected by this unprecedented heat stress in the 2070s, with about 76 million being extremely vulnerable.

2.4. Impacts from climate-related hazards on workers and employment

Indonesian provinces are at high risk from climate-related hazards due to a combination of three factors: (i) potential of a hazard occurrence; (ii) being exposed to or proximate to the hazard source; and (iii) having predisposed vulnerability that reduces adaptive capacity to the hazard. An interaction among these factors causes hazard events that result in both economic and non-economic losses that will, in turn, put pressure on industries, businesses people and the Government. While the presence of a hazard source and exposure to the hazard source are difficult to modify, reducing the third factor on vulnerability can serve as an objective that necessitates the need to strengthen social protection systems and schemes and carve out fiscal space for extending social protection.

According to the University of Notre Dame's ND-GAIN Index, which calculates a country's vulnerability to climate change and other global challenges in combination with readiness to improve resilience, Indonesia is the 76th-most vulnerable country in the world based on 2020 data, slipping down slightly from being the 78th-most vulnerable out of 181 countries in the 2017 Index (University of Notre Dame, n.d.). East Java, Jakarta, Central Java and West Java are Indonesian provinces with concentrated economic activities, and are forecasted to incur a high share of climate-related costs from sea level rise and health and agricultural costs (Netherlands, Ministry of Foreign Affairs 2019).

Due to the high levels of vulnerability to a range of climate-related risks, Indonesians are exposed to several impacts and challenges. Below we discuss three types of climate-related impacts that have implications on workers and their employment and that will be relevant for the three social insurance schemes under consideration.

2.4.1. Physical losses

Most of Indonesia's population, factories and industries, and agricultural lands are located in low-lying coastal areas, making them particularly vulnerable to significant physical and socio-economic impacts, even from moderate sea level rise (Case, Ardiansyah, and Spector 2007). It is predicted that sea level rise will result in areas of land getting inundated, with commercial and residential property losses accounting for 84 per cent of costs from sea level rise (United States, USAID 2017). The current subsidence or sinking occurring in Jakarta Bay, combined with sea level rise, will result in massive impacts on infrastructure and businesses (Case, Ardiansyah, and Spector 2007). This will translate into major financial losses for Jakarta, which can be as high as 80 per cent of all costs from sea level rise in Indonesia (United States, USAID 2017). Impacts from sea level rise is often closely associated with those from coastal flooding and inundation. With loss of land to the sea and freshwater supplies becoming critical, migration of communities is expected to increase. Migration will also result in an increased need for resettlement, which can further cause difficulties in obtaining employment (Asuncion and Lee 2017). Migration led by sea level rise in Indonesia is expected to have one of the highest impacts on GDP in Asia (Pycroft, Abrell, and Ciscar 2015). Labour migration from Indonesia to elsewhere in Asia and the Pacific and beyond is a longstanding occurrence, but this can be further exacerbated by climate change. Jakarta is not only at risk from sea level rise, but also from land subsidence, and the combination of sinking land with rising water is expected to leave Jakarta partially submerged by 2050 (Mulhern 2020b). This is bound to further push displacement and relocation. Out migration of labourers can result in labour shortages in the agriculture, tourism, healthcare and service sectors, driving a rise in the wages, with additional burden placed on employers.

The major Indonesians urban centres such as Jakarta, Medan and Bandung, home to more than 13 million, 2 million, and 4 million people, respectively, have been severely affected by floods. For instance, the 2007 flood in Jakarta caused damages that amounted to more than US$900 million (World Bank, n.d.-b). In March 2022, flooding and landslides affected 50,000 people in Java, Kalimantan and Sumatra islands, leaving homes damaged and people displaced (Davies 2022). Displacement and migration will become a prominent issue for the labour market and could lead to labour shortages, high relocation costs, rises in wages and burdens on employers. In addition, disruptions in connectivity and transport routes can reduce access to markets and reduce demand, thereby reducing economic activity in the areas affected.

Literature suggests that floods and heavy rainfall have serious impacts on the livelihoods of people engaged in the agriculture, fishing and forestry sectors, mainly through loss of productive assets and loss of work days due to hazard-related injury or illness (Karki and Pradhan 2011). Flooding of factories located in flood-prone regions also results in breaks in employment for workers engaged in these factories (Stuart 2022), potentially due to closures, and can result in a temporary reduction of wages. Agricultural workers who are self-employed may incur loss of income due to damages to farmlands and equipment during or after a flood or cyclone season, and this may translate into prolonged loss or reduction in income for more seasons as farmlands may remain unusable due to saline inundation. Preparing land for farming post-disaster may require significant investments from self-employed agricultural workers. Daily wage labourers or manual workers who are in turn employed by agricultural workers and farms may lose out on wage days due to damaged farmlands that lead to agricultural activities being temporarily suspended.

Hsiang (2010) reviewed the impacts of cyclones on sectors and labour productivity, and concluded that output decreases for agriculture, hunting and fishing, wholesale and retail trade, restaurants and hotels, mining, and utilities following cyclones, whereas construction expands, presumably because of its role in reconstruction. Agriculture and the tourism industry suffer most from cyclones, with a highly disproportionate loss of tourism-related income. Decline in output from different industries over time may result in a decline of annual overall output for Indonesia, with workers suffering from lower wages, higher prices and increasing inflation, resulting in cumulatively higher expenses for workers.

In Indonesia, according to 2022 numbers, about 29 per cent of people in work are engaged in agriculture, forestry, hunting and fisheries, 19 per cent in wholesale and retail, and nearly 13.7 per cent in the manufacturing sector (Indonesia, BPS 2022a). All of these workers and sectors are at risk of being disproportionately affected by cyclones and other compounding hazards. Additionally, in 2019, 11.83 per cent people were employed in the tourism industry alone, with employment numbers rising annually in this sector (Indonesia, BPS 2022b); it can be expected that workers would need increased protection against cyclone-related risks, among others, as these can cause disruption to employment for extended periods of time. Economic impacts of cyclones can last for a year (Hsiang 2010), which implies that factories/industries/workers who are directly impacted may need support for up to a year following an extreme event. While the risk of falling into unemployment due to storms is not high, a study by Pecha Garzón (2017) showed a high probability of falling into informality as a coping mechanism during cyclones. Workers engaged in establishments that cater to tourists, such as hotels, restaurants, guest houses or sightseeing spots, may disproportionately suffer from a loss of income when physical damage is caused to such establishments. Additionally, touring companies, tourist guides as well as tertiary earners such as angkot (four-wheeled public transport) and ojek (two-wheeled public motorcycle) may incur income losses as well due to flooded or damaged roads and bridges and disrupted infrastructure. Since these workers are not officially employed, they are not covered by any of the three social insurance schemes that can compensate for the income lost due to reduced employment opportunities.

As seen in the sections above, heavy rainfalls, flooding, sea level rise and landslides result in loss of infrastructure and affect livelihoods, with workers potentially undergoing a loss of income or temporary severance of employment. They can also increase migration rates and informality in employment.

2.4.2. Health losses

Heatwaves and increases in temperature in Indonesia are expected to have dire consequences on human health. Under the RCP6.0 scenario the projected change in temperature from the baseline in 1986–2005 is 1.1 degrees Celsius in 2040–2059 and 2 degrees Celsius in 2080–2099 (World Bank and ADB 2021). Heat gained rapidly due to exposure on such hot days can compromise the body's ability to regulate temperature, and result in a cascade of illnesses, including heat cramps, heat exhaustion, heatstroke, and hyperthermia (WHO 2018). Water scarcity and impacts on food systems resulting from droughts and heatwaves will impact health and nutrition. Compounding hazards associated with climate change, like recurrent droughts, fires and heat stress, will have implications on regional air quality and public health in Indonesia (World Bank and ADB 2021). Warmer temperatures will also lead to widespread vector-borne diseases. For instance, a minimum of 308 million people in Indonesia could be at risk from malaria by the 2070s, under both low and high RCP emissions pathways (WHO 2015).

A WHO report based on quantitative risk assessment of the effects of climate change on selected causes of death found that heat and undernutrition are the two major cause of climate-related deaths, especially among children. Other events like coastal flooding, diarrhoeal disease, malaria and dengue also cause climate-related mortality (Springmann et al. 2016). Lack of regular food supply and adequate nutrition intake during cyclones, floods or droughts can also result in reduced bodily capacity and declined productivity among workers, and even death in the worst cases. This could have important implications for pensions and survivor's allowances, as support given to recipients is often shared within Indonesian households.

US Agency for International Development (USAID) research for the Climate Change Adaptation, Thought Leadership and Assessments (ATLAS) suggests that climate-induced hazards such as floods and landslides will result in increased mortalities and displacement (United States, USAID 2017). Increased incidence of vector- and waterborne diseases (like malaria and dengue) will also become more common with increasing temperatures and in the rainy seasons (PEACE 2007). The increase in air pollution and wildfires will result in severe respiratory problems due to toxic gases such as carbon monoxide, ozone, nitrogen dioxide and hydrocarbons (Case, Ardiansyah, and Spector 2007). This may seriously impact the elderly, many of whom are pensioners. Health losses and injuries are also important for households where the main income earner is affected, since loss of insured workers (family members) will lead to loss of household income.

Agricultural workers, fishermen, forest dwellers who collect timber, rubber and other forest products, construction workers, miners and transport drivers are some of the most vulnerable groups at risk from the various hazards discussed here, due to their continued exposure to the source of the hazard. Injuries during working hours due to a climate-related hazard or declined productivity levels will both result in reduced incomes.

2.4.3. Economic Losses

Physical and health impacts, as discussed above, have direct implications on the economic losses that workers and their households undergo.

The USAID ATLAS assessment done in 2017 to provide relevant information for climate change adaptation programming and resilience building, predicted that the annual costs of climate change in Indonesia resulting from agriculture, health, and coastal impacts in the year 2050 could be as high as 132 trillion Indonesian rupiah (US$8.9 billion). Financial losses, at the household as well as at the state level, can result in lesser tax revenues earned, and in turn lesser social expenditure for social protection and/or social insurance.

Impacts of climate change in Indonesia will decrease food security as agricultural production patterns and outputs undergo changes due to shifts in rainfall, evaporation, run-off water and soil moisture (World Bank,

n.d.-b). Overall, the agricultural sector is expected to suffer, with a sharp decline in rice production projected. Increased damage to crops from floods, droughts and salinization is also projected (United States, USAID 2017). Economic losses due to climate-related hazards such as floods will accumulate due to: (i) decline in productivity from more breaks in employment as more hazards start compounding; and (ii) increases in costs for adaptation for employees and employers.

Agriculture in Indonesia accounts for 14.7 per cent of GDP, and flooding, drought, sea level rise and heat stress threaten Indonesian agriculture and the workers engaged in it. Flooding and droughts in Indonesia have already impacted agriculture: during 2003–2008 flooding and droughts, respectively, damaged 15 and 17 per cent of cultivated rice lands, leading to economic losses of $671.2 million for producers. In addition to rice, maize cultivation is also expected to suffer due to sea level rise through inundation and salinization (United States, USAID 2017).

Indonesia's Meteorology, Climatology and Geophysics Agency (BMKG) has insisted with certainty that heatwaves akin to what European countries face will not occur in Indonesia since the country's location in the equatorial region results in a different weather dynamics system that does not allow for the occurrence of heatwaves (Hendriana 2021). Nevertheless, warming temperatures are expected to affect Indonesia and its workers. Hsiang's (2010) work showed that even short-term increases in surface temperature are associated with large reductions in economic output across a set of industries previously considered "not vulnerable" to climate change, including wholesale and retail trade, restaurants and hotels, and other services, and can reduce the productivity of workers who are exposed to thermal stress in these sectors.

Going beyond the agricultural sector, the service sector will also face serious consequences due to changes in temperature resulting from climate change and a rise in "urban heat islands". Future urban expansions and increases in urban heat islands will result in additional stress that negatively impacts the labour productivity of the service sector due to reduced productivity and increased costs of preparedness and coping for adaptation (World Bank 2021).

The probability of unemployment has been found to increase in municipalities of Caribbean Colombia that are affected by floods. Real wages and number of hours worked decline, with an increase in self-employment figures following floods (Acevedo 2016). Caribbean Colombia can be considered as similar to Indonesia in terms of exposure to climate-related hazards, projected climate threats and informality of labour, and Indonesian workers could potentially face similar challenges.

Droughts have direct effects on primary sectors such as agriculture and forestry, with small-scale farmers engaged in rainfed agricultural practices being the worst affected. Those industries that use water as an input in their production process are also impacted. Indonesia's largest industries – agriculture, livestock, forestry, and fishing, followed by mining – are all heavily dependent on the availability of water. Prolonged droughts may also result in indirect impacts for non-agricultural sectors, as decline in agricultural productivity in the short term can eventually lead to reduction of wages and profits and disruptions in the trade sector (Freire-González, Decker and Hall 2017). In Indonesia, employment in agriculture as a percentage of total employment (modelled ILO estimate) was reported to be 27.73 per cent in 2020 (Trading Economics, n.d.). This constitutes a large share of the non-wage workers in Indonesia, mostly living in rural areas, who are exposed to the risk of declining wage levels in the face of recurrent droughts.

In November 2022, the new Indonesia Just Energy Transition Partnership (JETP) was launched as part of the G20 Meeting hosted by Indonesia. The JETP aims to support an accelerated just energy transition for the country, by moving away from fossil fuels and towards renewable sources (United Kingdom, Cabinet Office 2022). As the plan progresses, several workers, especially in mining and timbering occupations, may need to be adequately compensated and supported as they transition into more sustainable employment choices. A Just Transition of the Indonesian economy and society to environmental sustainability may also mean that workers who may be laid off (such as coal industry workers) might have to bear expenses for skills development and retraining, in addition to health and environmental costs and missed opportunities for the diversification of livelihoods and the economy.

3. Social insurance in Indonesia

3.1. Economic profile

In 2045, as Indonesia reaches 100 years of independence, the Government aims to achieve high-income status and reduce poverty to nearly zero. To realize this goal of developing into an advanced economy, the Ministry of National Development Planning (Bappenas) has prepared the Indonesia Vision 2045, building on four pillars: (i) Human Development and Mastery of Science and Technology; (ii) Sustainable Economic Development; (iii) Equitable Development; and (iv) National Resilience and Governance (Muhyiddin 2019). Out of these four pillars, pillars 2 and 3 are directly relevant for social insurance, as preserving workers' rights, providing protection during climate-related hazards, and supporting in recovery will be fundamental in allowing workers to develop their potential and contribute effectively to a booming economy, while ensuring that the needs of non-wage workers, platform workers and other forms of informally engaged workers are taken into account when extending coverage and planning for equitable economic development.

Some of the key economic trends in Indonesia that are relevant to workers, their employment and social insurance schemes are listed in box 1 below:

Box 1. Economic trends in Indonesia

- During 2020-50, the rate of Indonesia's annual real GDP growth is expected to increase by close to 1 percentage point, and annual GDP per capita by close to 0.2 percentage points (World Bank 2020).
- Like most countries in South and South-East Asia, the middle class in Indonesia has been experiencing a rapid expansion. This aspiring middle class comprises of 126 million Indonesians, or 48 per cent of the population, but it has yet to achieve economic security (World Bank 2020).
- While close to 24.7 million Indonesians live below the national poverty line, these numbers are expected to dwindle as poverty declines and the middle class grows (World Bank 2020).
- Beyond 2040, projections show a sharp increase in Indonesia's dependency ratio, which indicates the pressure being placed on the productive population as the ratio of those typically not in the labour force (those aged 0–14 and 65+) increases compared to those who are typically in the labour force (ages 15–64). This ratio could rise from 25 per cent to 47 per cent between 2040 and 2080.
- Indonesia has the fifth-largest elderly population in the world, and by 2050, persons above the age of 60 will reach 21.1 per cent of the total population (HelpAge Asia 2019).
- Indonesia continues to have a large share of informal workers.[7] According to ILO estimates, informal employment (excluding agriculture) is as high as 70 per cent, and lack of social protection coverage is strongly associated with lack of formalization of economic units (Nguyen et al. 2019).
- Job creation in Indonesia has fallen since 2010, dropping from 3.5 per cent to less than 0.5 per cent in 2015.

7 For the purposes of this report, informal employment is defined as all remunerative work (that is, both self-employment and wage employment) that is not registered, regulated or protected by existing legal or regulatory frameworks, as well as non-remunerative work undertaken in an income-producing enterprise (ILO 2003). In the context of Indonesia, informal workers mainly include (but are not restricted to) non-wage workers.

- 65 per cent of all new jobs created in the country in the five years between 2011 and 2016 were in low-productivity and low-skilled sectors like agriculture, wholesale and retail trade, and low-end services.
- The labour force participation rate of the economically active age group in 2021 stood at 62.91 per cent. Female labour force participation is 47 per cent (Indonesia, BPS 2022c).

As seen in box 1 above, Indonesia is undergoing a period of demographic as well as socio-economic transition, which will influence labour market dynamics and human capital in the future. Data on low job creation or the creation of low productivity jobs emphasize that new and decent jobs are required for Indonesia, expanding well beyond agricultural sector. This high degree of informality may further increase, however, due to climate-related disasters, leaving many without adequate protection, as many economic units in the country still lack formalization. Moreover, social protection coverage is one of the core elements to facilitate formalization of the informal economy. Therefore, reform measures are needed to formalize the informal economy and to extend social protection coverage to workers in the informal economy.

Creation of jobs across sectors and skill levels will also be necessary to alleviate the pressure on pension funds as the elderly population increases. A significant rise in the number of older Indonesians will lead to higher demand for more effective universal healthcare, social assistance and pension systems.

In its path to becoming a high-income country by 2045, these are some of the significant challenges that Indonesia is expected to undergo. High informality, high dependency rates, technology disruptions and the changing nature of work will also be exacerbated by climate-related shocks, making it necessary for the Government to provide adequate coverage for its citizens in need though social protection.

3.2. Social insurance

Social protection is defined as a set of policies and programmes designed to reduce and prevent poverty, vulnerability and social exclusion throughout the life cycle (ILO 2017a). Social protection includes nine main areas: (i) child and family benefits; (ii) maternity protection; (iii) unemployment protection; (iv) employment injury benefits; (v) sickness benefits; (vi) health protection (medical care); (vii) old-age benefits; (viii) invalidity or disability benefits; and (ix) survivors' benefits. Social protection systems address all these policy areas by a mix of contributory schemes and non-contributory tax-financed benefits. Many contributory social protection schemes guarantee protection through an insurance mechanism and are described as social insurance schemes. Non-contributory schemes cover a broad range of schemes, including universal schemes for all residents, categorical schemes for certain broad groups of the population, and means-tested schemes. Social insurance schemes may be partially financed or subsidized using general tax revenues for extending coverage and improving benefits and financial sustainability. Social assistance schemes are usually means-tested to target beneficiaries according to income levels. Social protection can be complemented by other labour market measures or employment promotion measures. For example, public employment programmes such as cash for work and food for work offer employment opportunities to certain categories of persons who are not able to find other employment; while public employment services, vocational trainings or other labour market measures help workers return to work, reskill and upskill.

It is now widely recognized that social protection contributes to economic and social development in the short and the long term and promotes structural transformation through inclusive and sustainable growth (ILO 2017a). However, as of 2020, 4.1 billion people – or roughly 53 per cent of the world's population –

are not covered by any form of social protection. This gap in coverage widens across regions in Asia and Africa, and leaves people vulnerable to poverty, inequality and social exclusion across the life cycle, as well as hindering economic and social development (ILO 2021a).

In 2020, 27.8 per cent of Indonesia's population was covered by at least one social protection benefit (excluding health) (ILO 2021a). While Indonesia has made considerable strides in reducing poverty levels, inequality in the country has grown over the years, with the Gini coefficient rising from 30 points in 2000 to 38 in September 2019 (World Bank 2020). It is nationally accepted that the increasing inequality in the country can be addressed by investing more in social protection systems, as has been seen from the experience of other middle-income countries that have accrued significant social, economic and political gains through such investments. The Constitution of Indonesia stipulates the right to social security for all Indonesian citizens (Indonesia, TNP2K 2018). Following the Asian Financial Crisis of 1997–98, social protection became part of the response, gained prominence and was scaled up by successive presidencies from 2004 up to the present.

In 2017, Indonesia invested about 0.73 per cent of its GDP into the social protection system, which comprises of a mix of social assistance and social insurance schemes. Most recently, the national social protection strategy for the period 2020–24 has proposed the expansion of the existing systems to target the poorest through social assistance, while also addressing the needs of the middle-income population by including informal workers (Indonesia, TNP2K 2018).

Starting in the 1990s, non-contributory schemes have been used as key policy instruments for addressing poverty and vulnerability. The major non-contributory schemes from the Indonesian Government include:

i. Rastra and Bantuan Pangan Non Tunai (BPNT): food assistance programmes that provide impoverished households with in-kind rice support and/or vouchers to purchase foods items, such as rice and eggs;
ii. Program Keluarga Harapan (PKH): the flagship conditional cash transfer programme of the Government, targeting pregnant mothers and children;
iii. Program Indonesia Pintar (PIP): cash transfer for students from poor and vulnerable families to support universal basic education; and
iv. Subsidized Health Insurance (JKN-PBI), a fully subsidized national health insurance for the poor.

In total, the Government spends about 0.55 per cent on its GDP on its non-contributory schemes (Indonesia, TNP2K 2018).

Social insurance programmes, financed by the contributions from members, received their first comprehensive policy framework in 2004 with the establishment of the unified national social security system (SJSN). In 2011, the institutional framework governing social insurance was created by establishing its administering body, called the Badan Jaminan Sosial Nasional (BPJS) (OECD 2019). In the same year, the social security agency was further divided into Social Security Agency for Employment (BPJS Employment) and Social Security Agency for Health (BPJS Health). BPJS Health was brought into the purview of the newly established national health insurance programme – Jaminan Kesehatan Nasional (JKN) – in 2014 (Indonesia, TNP2K 2018).

Under BPJS Employment, five main employment benefit schemes are implemented:

i. old age savings (JHT);
ii. death benefit (JKM),
iii. employment injury insurance (JKK),
iv. pension scheme (JP); and
v. unemployment insurance (JKP).

In many countries, social assistance has been the most prevalent mode of response during the COVID-19 crisis (Gentilini et al. 2022). However, with increasing climate risks and impacts, it is becoming clear that poverty-targeted schemes may not be adequate in protecting those who are "climate vulnerable". Cash transfers or public work programmes often target the poorest populations and may miss the ones who are at risk of falling into poverty during large-scale covariate shocks. This is especially true for primary sectors (agriculture/forestry/fishing), as well as for workers in the informal sector and the self-employed. However, there remains limited global evidence on the use of social insurance for crisis response. But to increase the coverage, to protect people with different forms of vulnerability, and to eventually move towards well-established social protection floors for all, it is important to explore what role social insurance schemes can play – in addition to social assistance – in responding to climate-related shocks.

Social insurance in Indonesia was introduced in the 1960s, while social assistance is still in its nascent stage (World Bank 2020). The Asian financial crisis of 1997–98 prompted the introduction of the National Social Safety Net, and so far, support given after most crisis situations in the country has been in the form of ad hoc social assistance programmes or subsidies, with support from social insurance being limited to wage workers (World Bank 2020). To understand how social insurance can also complement social assistance programmes during crisis response, this study explores the attributes of three social insurance schemes operated by BPJS Employment, namely the unemployment insurance scheme (JKP), the employment injury insurance scheme (JKK), and the pension scheme (JP). [8]

3.2.1. Pension scheme (JP)

> According to Government Regulation No. 45 of 2015 concerning the Implementation of the Pension Security Programme (article 1(1)), JP is a social security that aims to maintain a decent degree of life for participants and/or their heirs by providing income after participants enter retirement age, experience permanent total disability, or die.

Policy and implementation: The pension scheme was introduced in July 2015 by the Government and is implemented by BPJS Employment.

Objective: The objective of the pension scheme is to serve as a long-term insurance against declining productivity and longevity in old age, by providing a part of the income earned during the working years as monthly cash transfers (Indonesia, BPJS Employment 2021).

Financing and contribution: The JP scheme is financed by contributions from employees and employers. The amount of contribution made by employees towards their pension fund is 1 per cent of their monthly income, topped up by a 2 per cent contribution from the employer. This makes up a total of 3 per cent of the monthly income being contributed for JP by every salaried employee. The monthly salary used to determine the contribution amount is the basic salary along with any fixed allowances. The highest salary limit used for calculating contribution is indexed with GDP growth every year, in 2022 it was set at 9,077,600 rupiah.

Eligibility: To receive pension benefits from the JP scheme, the salaried employee needs to meet the minimum contribution period of 15 years or the equivalent of 180 months when entering pensionable age until death (Indonesia, BPJS Employment 2021). The pensionable age is 58 years in January 2022 and will be

8 We selected schemes that provided periodic payments of benefits. The old-age savings scheme (Jaminan Hari Tua, or JHT) and the death benefit scheme (Jaminan Kematian, or JKM) provided lump-sum payments and were therefore excluded from this study.

subsequently increased by one year for every subsequent three years until reaching the retirement age of 65 years in 2043. Currently, the JP scheme does not cover civil servants and non-wage earners.

Disability pension benefits are given to participants who have a permanent total disability due to an accident or illness and are unable to work again. Recipients are paid this pension until death. In case the participant experiences permanent disability prior to reaching 15 years of contribution, they are still entitled to benefits if the event that caused total disability occurred at least 1 month after becoming a participant of the JP scheme and the participant made contributions with a density rate of at least 80 per cent.

Widow/widower pension benefits are given to widows/widowers who are heirs of a JP participant and are registered with BPJS Employment. These benefits are paid until death or remarriage. If the participant dies before reaching the contribution period of 15 years, the widow/widower is still entitled to benefits if there was a minimum of one year of participation in JP and a contribution density rate of 80 per cent.

Child pension benefits are given to children who are the heirs of a JP participant until the child reaches the age of 23 years, starts working, or marries. If the JP participant dies before the retirement age or if the contribution period is less than 15 years, the child still receives benefits if the participant had a minimum participation of one year and met the contribution density rate of 80 per cent. The maximum number of children who can be registered in the pension plan is two.

Parental pension benefits are given to parents (father/mother) who are the heirs of unmarried JP participants. The same rule as widow/er or child pension exists if the JP participant passes away before reaching 15 years of contribution.

Benefit level: Benefit levels vary according to the recipients. The monthly pension received by pensioners in 2022 ranged from 363,300 to 4,357,900 rupiah. The minimum and maximum benefits are adjusted with inflation every year. The benefit level for the pension is calculated as:

Amount of monthly benefits = 1% x no. of years of service x average career indexed salary [9]

The accrual rate is 1 per cent per year of contribution.

For persons with total and permanent disability, the benefit level is calculated as:

Amount of monthly benefits = 1% x length/12 months x weighted average wage

For the widow/widower pension, the amount of monthly benefits is calculated as follows:

i. 50 per cent of the old-age pension benefit formula, for participants who died before receiving pension benefits; or
ii. 50 per cent of the old-age pension benefit or disability pension benefit, for participants who died after receiving the pension benefit.

In case the monthly benefit calculation results are below the minimum benefit, then the benefit provided is the minimum JP benefit for the current year.

For orphan/children's pensions, the benefit level is calculated as follows:

i. 50 per cent of the old-age pension benefit formula, for participants who died before receiving pension benefits and did not have a widow/widower;

9 Career salaries indexed with inflation.

ii. 50 per cent of the old-age pension benefit or disability pension benefit, for participants who died after receiving pension benefits and did not have a widow/widower; or
iii. 50 per cent of the widow/widower's pension benefit, for widows/widowers who have died or remarried.

For parent pensions, the benefit level is calculated as follows:

i. 20 per cent of the pension benefit formula for participants who died before receiving pension benefits; or
ii. 20 per cent of the old-age pension benefit or disability pension benefit, for participants who died after receiving the pension benefit.

For persons who do not qualify for an old-age, disability or survivor's pension, a lump sum reimbursement of contributions plus interest is provided. Pension security benefits are calculated as the accumulated contribution plus the proceeds of its development if:

i. the participant enters retirement age and has not met the minimum contribution period of 15 years;
ii. the participant has a permanent total disability, but the incidence of permanent total disability experienced by the participant occurred less than 1 month since the participant registered for the JP scheme and/or the participant did not meet the minimum contribution density rate of 80 per cent; or
iii. the participant died but did not meet the participation period of at least one year and/or the minimum contribution density rate of 80 per cent.

Note: If the monthly benefit calculation results are below the minimum benefit for the various pension types, then the benefit provided is the minimum JP benefit for the current year.

Frequency and duration: Once the employee reaches pensionable age, they start receiving monthly pension payments in cash, on the first of every month, until death.

Coverage: In 2019, 12.9 million persons were active members of the pension scheme (Indonesia, BPJS Employment 2021). The scheme requires large and medium enterprises to register their employees on a mandatory basis; while employers of small and micro enterprises are not obliged to do so, and non-wage workers are not permitted to participate in the scheme. These factors contribute to the low coverage.

Information system: BPJS Employment maintains a database that has information on all participants of the JP scheme. Benefit claims for the scheme can be made online.

Application and registration: By law, every employer is required to enrol all their employees in the JP scheme within 30 days from when an employee starts working. The employee can also register himself with BPJS Employment as a participant in the JP scheme by filling out the registration form and bringing files such as their employment contract/ appointment letter/employee certificate and an identity card/family card. If an employee who is a participant in the JP scheme changes jobs, the employee is required to inform his participation to the employer in the new place by showing their Employment BPJS participant card.

If the participant of the JP scheme has entered pensionable age but continues working, then they may choose to receive pension benefits parallelly, or when they stop working, so long as it is not later than three years after entering pensionable age.

Accountability: BPJS Employment is the mandated body for ensuring accountability. If a company refuses to pay JP contributions for its employees or fails to register its employees, BPJS Employment can subject the employer/company to administrative sanctions in the form of written reprimands, fines and restricting access to certain public services. Employers are also expected to collect the contributions from the employee's salary and deposit it directly with BPJS Employment.

3.2.2. Employment injury insurance scheme (JKK)

> According to Government Regulation No. 44 of 2015 concerning the Implementation of the Work Accident and Death Insurance Program, JKK is a benefit in the form of cash and/or health services provided when participants experience an occupational accident or illness caused by the work environment.

Objective: The objective of the employment injury insurance scheme is to provide protection to an employee against accident or an occupational disease arising out of and in the course of their employment. JKK covers accidents that may occur while at work, commuting to and from work, and during official travel, as well as illnesses caused by the work environment (Indonesia, BPJS Employment 2021).

Return To Work is an expansion of benefits in the JKK scheme in the form of assistance to participants who experience work accidents that cause disabilities/potential disabilities.

Financing and contribution: Financing of the JKK is made by contributions, which are usually the responsibility of non-state employers. The contribution ranges from 0.1 per cent to 1.6 per cent of the monthly wage of an employee, depending on the level of risk and protection needed, and is calculated by using the monthly salary as the base along with any fixed allowances. The contribution rates are as follows:

- very low risk level at 0.10 per cent of the monthly wages;
- low risk level at 0.40 per cent of the monthly wages;
- moderate risk level at 0.75 per cent of the monthly wages;
- high risk level at 1.13 per cent of the monthly wages; and
- very high risk level at 1.60 per cent of the monthly Wages.

For non-wage workers, the contribution rate ranges between 10,000 and 207,000 rupiah, depending on their income. For construction workers, this rate is set at 0.21 per cent of the project value. The amount of contribution is set to be evaluated every two years (Sanusi and Tsuruga, forthcoming).

Eligibility: Both wage earners and non-wage earners are included in the JKK. Wage earners can be those who work for an individual or a corporation, as well as foreigners who have been working in Indonesia for six months.

Non-wage earners include employers, self-employed individuals, and any other workers who are non-wage earners. Non-wage earners are eligible for compensation if they have not missed more than three months of consecutive contributions.

Workers are eligible for compensation only when the occupational injury is reported in a timely manner, via completion of reports on injury, disease, disability or death within 48 hours. The right to claim JKK benefits is valid within five years from the date of occurrence of the injury/accident.

Benefit level: JKK benefits include medical services, home care treatment and cash benefits, reimbursement of orthosis and/or prostheses, dental implants, hearing aids, and glasses,

The JKK benefits paid to survivors for workers who die as a result of work accidents are:

i. death benefit of 60% x 80 months x a month's wages;
ii. funeral expenses of 10,000,000 rupiah;
iii. periodic compensation is paid in one lump sum of 24 x 500,000 rupiah = 12,000,000 rupiah; and
iv. scholarships for a maximum of two children are given periodically every year in accordance with the child's education level.

Compensations amount to 70 per cent x 80 months x a month's wage for permanent total disability; the percentage according to the disability table x 80 months x a month's wage for partial anatomical disability; and the percentage according to functional reduction x the percentage according to the disability table x 80 months x a month's wage for partial functional disability.

Compensation for a Temporarily Unable to Work (STMB) condition amounts to:

- 100 per cent of wages for the first 12 months;
- 50 per cent of wages thereafter.

Travel reimbursements are provided for workers who meet with work accidents for air transportation (10,000,000 rupiah); land, river or lake transportation (5,000,000 rupiah); and sea transportation (2,000,000 rupiah).

The monthly wage used as the basis for calculating JKK benefits for construction service participants is the daily wage x 25 days.

Frequency and duration: Depending on the type of benefit level being accessed, the frequency and duration differ. For instance, medical benefits are unlimited until recovery, home care is provided for a maximum of one year, and scholarships for children are given periodically every year depending on the level of education.

Coverage: Active contributors in 2019 amounted to 34.2 million persons in total, including 16.0 million wage workers, 2.7 non-wage workers, and 11.3 million construction workers who were registered by construction projects (Indonesia, BPJS Employment 2021). It is mandatory for employers to enrol their employees and for non-wage workers to enrol themselves.

Information system: BPJS Employment maintains a database that has information on all participants of the JKK scheme.

Application and registration: Application and registration for the JKK scheme can be directly made by the employer on the official website of BPJS Employment, followed by verification via a visit to the nearest BPJS Employment branch, for which the employer needs to bring all necessary documents

Accountability: BPJS Employment holds employers accountable for contributions. If an employer misses more than three consecutive months of contributions, injured/disabled participants will have to be compensated directly by the employer and the employer will only be reimbursed by BPJS Employment once overdue fees and fines are paid.

3.2.3. Unemployment insurance scheme (JKP)

> According to Government Regulation of No. 37 of 2021 concerning the Implementation of the Job Loss Insurance Program, JKP is a social security that aims to maintain a decent degree of life for participants who have experienced termination of employment.

Objective: The objective of the unemployment insurance scheme is to provide protection to workers who face termination, by providing them with cash benefits, counselling, job market information and training. The JKP scheme is expected to enable unemployed workers to maintain decent livelihoods and get reintegrated into the labour market.

Financing and contribution: The JKP scheme is financed by the employer and the Government. Contributions are made partially by the Government (0.22 per cent) and partially by the employer (0.24 per cent), making up a total of 0.46 per cent of the monthly wage. The contribution for the JKP scheme is calculated by using the monthly salary as the base in addition to any fixed allowances. The upper limit of salary for calculating the contribution is set at 5,000,000 rupiah. Beyond this, even if the salary increases, the contribution is still calculated at 5,000,000 rupiah.

Eligibility: Workers must contribute to BPJS Health, and must be active members of JKK, JKm and JHT for 12 months within the last 24 months, including 6 consecutive months. The termination of the worker's contract must be involuntary. They should be capable, and willing to work in the future and confirm this by providing a certificate. Claims for JKP benefits should be made within three months after the termination of employment.

Benefit level: The unemployment benefit is calculated as 45 per cent of the last reported salary for the first three months, followed by 25 per cent of last reported salary for the following three months. The cash pay-out is capped at 5,000,000 rupiah. The JKP beneficiaries are also entitled to access career counselling, training and labour market information.

Frequency and duration: The unemployment allowance is provided for a period of six months.

Coverage: Salaried workers are covered by the JKP scheme if they meet certain criteria like being an employed Indonesian citizen, less than 54 years old when registering. It is mandatory for large, medium and small enterprises to enrol their employees, and voluntary for micro enterprises to do so. Participants in the JKP scheme must also be registered with JKK, JKM, JHT and JKN. Exact numbers on coverage of the JKP scheme were not available at the time of writing this report, given the nascency of the programme.

Information system: The existing BPJS Employment database is being used to record the data of persons registered in the JKP. The Ministry of Manpower and BPJS Employment are developing a single window service by integrating functions of each institution into a single web platform. [10]

Application and registration: Employers are responsible for registering their new employees with the BPJS Employment.

Accountability: BPJS Employment holds employers/companies accountable for making contribution payments as well as for registering new employees. In case of failure to comply with the law and regulation, the employer will be penalized according to stipulated administrative sanctions.

10 Siap Kerja (https://siapkerja.kemnaker.go.id/).

3.3. Social insurance for climate risks: Aligning with national priorities

In the previous sections, the report has discussed the climate risks and impacts affecting Indonesia as well as the social protection system in the country through an overview of three social insurance schemes. Under Indonesia's G20 presidency, social protection systems have received more attention to address and manage climate risks, as well as to ensure that the needs of people are met throughout a just and affordable transition. In discussing approaches to climate transition, Indonesia's Ministry of Finance (2022) has expressed commitment towards ensuring that those living in poverty and other vulnerable groups are protected, instead of falling further into poverty or unemployment. Vulnerable groups at risk from climate risks include not only households in poverty, but also an increasing number of middle-income households and the working class, who have limited coping/adaptive capacity and are in need of comprehensive protection. The role of Adaptive Social Protection (ASP) for all can be discussed in this light.

ASP has emerged as an approach to address the risks and impacts arising from covariate shocks such as natural disasters, economic crises, pandemics, conflicts, and forced displacement (Bowen et al. 2020). ASP is being used as a tool to reduce negative impacts that arise from an increased interaction of these crises by combining the three sectors of: (i) social protection; (ii) disaster risk management; and (iii) climate change adaptation (UNU-IEHS 2020). In practice, this means exploring whether the social protection system and its programmes can be adapted to prepare for and manage covariate shocks (including natural disasters), reduce and adapt to the impacts resulting from climate-related hazards.

ASP as a focus area requires coordination among agencies and institutions working within the three aforementioned spheres of social protection, disaster risk management and climate change adaptation, as well as finding ways to more effectively prevent, prepare for, cope with, adapt to and eventually build long-term resilience towards climate-related risks. Keeping this objective in mind, Indonesia has been an international pioneer in promoting ASP, and the Government of Indonesia has been facilitating discussions on ASP at the national and international level.

The Ministry of National Development Planning (Bappenas) actively promotes ASP, and Indonesia's National Mid-term Development Plan (RPJMN 2020–2024) anchors ASP and encourages expansion of the existing social protection system and its programmes. A hazards, exposure and vulnerability assessment conducted across regions and provinces in Indonesia to inform the discussion on the ASP strategy in the country has recognized that natural and climate-related hazards – as well as their impacts on communities, such as food insecurity, health impacts and poverty – should be core aspects to be addressed by ASP in the country (Sett et al. 2022). To be ready for future events, there is a need for better coordination between non-contributory and contributory (social insurance) schemes, and better coordination among agencies to deliver programmes, especially in the face of climate change (World Bank 2020). Social insurance schemes such as JP, JKK and JKP are uniquely placed to provide coverage to insured workers, complementing social assistance schemes that target people living in extreme poverty. Poverty-targeted programmes, either government or internationally supported, may leave out workers who lose jobs or are injured during extreme events, as assistance gets channelled to the most vulnerable and households in (extreme) poverty. Therefore, to increase the coverage of people with protection during climate-related shocks, especially high magnitude ones, it could be beneficial to consider social insurance in the toolbox of instruments adopted within the comprehensive strategy of ASP.

BPJS Employment, as the administrator of the three social insurance schemes under discussion in this report, has information on registered workers with pre-established transfer mechanisms. These can be useful to provide immediate compensation at shorter time scales to workers who are physically injured, have lost their jobs or have incurred an accident due to climate-related events. Since the workers are already registered, with their bank account information, address and location available, verification processes can be made easier. Accessibility of support can be improved by sharing information and messages using pre-established

communication channels like SMS alerts. Since registered workers have an existing and trusted relationship with BPJS Employment, and preliminary awareness of the agency's transfer mechanisms and application procedures, it might be easier for them to claim support if similar mechanisms are adapted to be used in case of extreme climate-related events.

Social insurance schemes like JKP can incorporate job-related trainings, and thereby support workers to transition from carbon-intensive sectors and industries in addition to providing appropriate support in job placements for other, to less carbon-intensive sectors where labour demand may be rising, such as climate risk-informed construction activities, for example.

It must be borne in mind that social insurance schemes alone cannot help all workers, especially non-wage workers, who are currently excluded from JKP. As an unemployment insurance scheme, JKP has not been designed to cover non-wage workers, and while some countries have extended unemployment insurance coverage to non-wage workers, the number of such cases remains still limited. Even for workers registered with these three social insurance schemes and affected by covered contingencies, qualifying conditions such as minimum contribution durations may prevent them from receiving benefits. In such cases, social assistance, public works, subsidies or any other labour market measures must be ready to provide seamless support to them.

4. The role of social insurance in addressing various shocks

This section aims to provide possible analytical frameworks to discuss what roles the existing social insurance schemes in Indonesia could play in protecting workers and their families affected by climate-related shocks, and how these schemes could become more effective through temporary expansion in times of crisis. The report focuses here on identifying patterns of temporary expansion measures learned from international practices and categorizing them to develop an analytical framework.

For this study, a literature search and review were conducted to identify country examples wherein social insurance schemes such as invalidity, survivors' and old-age benefits, employment injury benefits, or unemployment benefits were used to address the impacts of climate-related risks. In the following section, findings from this search have been presented to show how different countries undertake different types of measures, including:

- horizontal expansion (increasing coverage);
- vertical expansion (increasing adequacy);
- other adaptive measures (adjusting programme parameters);
- piggybacking (using existing programme delivery mechanisms); and
- alignment (aligning ad-hoc interventions with existing social protection schemes).

4.1. International practices

4.1.1. Response to climate risks

Argentina

Measures applied:

- Horizontal expansion
- Vertical expansion (family benefit, maternity benefit, unemployment benefit, old-age benefit)

In Argentina, extreme weather events such as floods, volcanic ash and landslides have been periodically disrupting people's lives and livelihoods. The Government responded to such disasters by granting a special subsidy to social security beneficiaries registered with the National Social Security Administration (ANSES). Some of the benefits provided for natural disasters (including climate-related ones) include:

i. Family allowance, including child allowance, disabled child allowance, prenatal allowance and unemployment benefits for salaried workers (vertical expansion);
ii. Universal child allowance for families suffering from unemployment or working in the informal economy and domestic workers (vertical expansion); and
iii. Support for Argentinian students, targeting young people and offering them training and labour market integration (horizontal expansion).

A one-time lumpsum payment was also given to pensioners (vertical expansion) receiving only the minimum pension level. Contact points close to the disaster-affected areas were established in advance to serve as information outlets, where applications for allowances could be filed using a dedicated form. An ANSES agent would pay a visit to the applicants' home to verify their needs, following which the payment was disbursed. It was possible to make immediate payments where the affected areas could be identified by postal code and cross validated with locations of individuals' homes that were already in ANSES databases (ISSA 2017).

Jamaica

Measure(s) applied:

- Vertical expansion (old-age benefit)

Jamaica was hit in 2007 by hurricane Dean, the strongest Atlantic cyclone of the season. In response to this, a one-off payment was given to pensioners by the National Insurance Scheme, funded from the existing pension fund, thereby extending vertically by provision a top-up.

Fiji

Measure(s) applied:

- Other adaptative measure (withdrawal from a contributory fund)

Severe tropical cyclone Winston made landfall in Fiji in February 2016 and was one of the costliest cyclones in terms of financial losses ever recorded in the South Pacific basin (Masters and Henson 2016). This Category 5 cyclone warranted a mix of responses from the Government of Fiji, building on the country's existing non-contributory and contributory schemes. The National Provident Fund in Fiji is a defined contribution retirement fund comprising employers' and employees' contributions. Nine days after the disaster, affected households were allowed to withdraw cash from their provident fund accounts. The National Provident Fund covers only formal sector employees, and active contributing members were allowed to withdraw up to FJ$1,000 (US$452), plus an additional FJ$5,000 (US$2,262) in case the member was able to prove having a house in the affected area. By April 2016, 170,000 withdrawals were approved, and this amounted to approximately FJ$250.2 million (US$113 million) (European Commission 2019). According to the *2020-21 Annual Report* of the Fiji National Provident Fund, FJ$8 million (US$3.6 million) were withdrawn from the fund for natural disasters (including climate-related ones) (Fiji, FNPF 2021).

The Philippines

Measure(s) applied:

- Other adaptative measure (advance payment of pension)

In December 2021, typhoon Rai, locally known as Odette, hit the islands and coastal communities in the east of the Philippines, resulting in severe torrential rains, flooding, landslides and storm surges. The Category 5 typhoon affected 7.8 million people across 11 regions of the country and destroyed essential infrastructure including health facilities, at a time when people were already reeling under the socio-economic impacts of

the COVID-19 pandemic (WHO 2022). After the typhoon made landfall, the worst affected regions including Mimaropa, Western Visayas, Central Visayas, Eastern Visayas, Northern Mindanao and Caraga were placed under a one-year state of calamity. In these six regions, members and pensioners registered with the state-run pension fund of the Social Security System (SSS) were declared eligible for a "calamity assistance package". The fund set aside 2.18 billion Philippine pesos in assistance to provide a three-month advance pension for retirement, disability and survivor pensioners, as well as Calamity Loan assistance and direct House Repair and Improvement Loans for members. Applications could be made online or through the Government Service Insurance System (GSIS) Wireless Automated Processing System kiosks located in all GSIS offices (de Vera 2022).

In September 2022, the SSS announced the "Three-Month Advance Pension for Social Security and Employees' Compensation" programme to extend financial assistance to its members and pensioners in areas affected by super typhoon Karding. Applicants from the declared calamity areas affected by the typhoon can apply from October 2022 until January 2023, for the three-month advance pension by submitting a duly filled Application for Assistance Due to Calamity/Disaster duly certified by their Barangay Chairman [11] at any SSS branch. In the absence of the certification, a certification from the Department of Social Welfare and Development or the National Disaster Risk Reduction and Management Council would be accepted. The advanced pension will be released by check via the same branch where the application was filed and will be mailed to the pensioner's mailing address if not claimed from the branch within ten days. One caveat of the programme is that pensioners with existing loans under the Pension Loan Program do not qualify to apply for said advance pension (Philippines, SSS 2022).

Viet Nam

Measure(s) applied:

- Other adaptative measure (expansion of administrative capacity)

Viet Nam faces approximatively five to six tropical storms and three tropical depressions annually. In 2020, between October and mid-November, the country was ravaged by 14 storms, affecting 1.5 million people due to extreme flooding. Central Viet Nam was the region that was worst affected (Nguyen 2020). To protect businesses and participants in the social and health insurance systems also residing in the flood- and storm-affected areas, Viet Nam Social Security's branches created favourable conditions to enable continued participation and receipt of benefits from the schemes. Staff were allocated in offices to ensure that participants in social, unemployment and health insurance schemes received their payments. Provisions were also made to collect contributions from the participants by dispatching staff to go and collect the money directly. The branches worked closely with local post offices to plan for timely payment of pensions and social and unemployment insurance allowances during the storm and flood events. To facilitate the process, the use of electronic transactions, online public services and online payments were promoted to shorten the time involved and to cut costs for participants and policy beneficiaries (Viet Nam, VSS 2020).

11 Barangay chairman, also called the Barangay Captain, is the highest elected official in a barangay, the smallest level of administrative division in the Philippines (Philippines, PSA 2022).

4.1.2. Response to other crises

Lao People's Democratic Republic

Measures applied:

- Piggybacking (unemployment benefit)
- Other adaptative measure (relaxation of qualifying conditions for unemployment benefit)

In 2021, under the ILO-led programme "Protecting Garment Sector Workers: Occupational Safety and Health and Income Support in Response to the COVID-19 Pandemic" funded by BMZ, the Lao Social Security Organization (LSSO) relaxed the eligibility criteria of its unemployment insurance scheme to expand coverage to all workers in the garment sector who were members and had contributed only one month to the LSSO (instead of the initial mandatory contribution period of 12 months and eligibility criteria of being unemployed due to supply chain disruptions and factory closures). In addition, eligibility was also granted to garment sector workers who were not members of the LSSO but who were members of garment associations. The project essentially piggybacked on the LSSO's and garment associations' existing databases/membership lists and LSSO's delivery mechanisms to extend support to over 20,000 targeted beneficiaries in 47 factories (ILO 2021b). The project gave a one-off payment of approximately US$90 – equivalent to two months of regular unemployment benefits calculated on the minimum wage.

Malaysia

Measures applied:

- Vertical expansion (old-age benefit)
- Other adaptative measure (relaxation of qualifying conditions for unemployment benefit)

In April 2020, 850,000 pensioners in Malaysia were given a one-time cash transfer of 500 Malaysian ringgit per person in the face of the COVID-19 pandemic (Gentilini 2022). Moreover, the qualifying conditions for unemployment benefits were relaxed. Employees who did not meet the minimum contribution period, or whose contract was not extended after having been renewed at least three times in the past could still receive up to 30 per cent of their salary for a period of three months as of January 2021 (Gentilini 2022). Previously, employees were required to make 12 months of contributions in the last 24 months prior to employment termination, and the expiry of a fixed-term contract was not a qualified reason for unemployment benefits (Tsuruga 2020a).

Viet Nam

Measures applied:

- Vertical expansion (unemployment benefit, employment retention)
- Other adaptative measure (relaxation of contribution requirements)

To mitigate the difficulties faced by companies in meeting their contribution requirements during COVID-19, Viet Nam removed late payment-related penalties, as well as temporarily suspended the payment of social insurance contributions to the pension and survivor benefit funds for up to 12 months (ILO 2020), in addition to reducing the employment injury insurance contribution rate to 0 per cent (Viet Nam, VSS 2021). The Government used the reserve of the unemployment insurance fund to provide cash transfers for 13.3 million workers who suffered from the pandemic (VSS 2022). The Government also used the unemployment insurance fund to support employers to organize vocational training aimed at work retention.

China

Measure(s) applied:

- Other adaptative measure (relaxation of contribution requirements)

As a result of COVID-19, China initiated a number of adaptive measures to safeguard its workers and companies from February 2020 onwards. Complete exemptions from employer contributions for the old-age, unemployment and work injury insurance schemes were introduced for sole proprietorships and small- and medium-sized enterprises (SMEs) in China for up to five months; whereas for larger enterprises, employer contributions could be reduced by 50 per cent for up to three months. Enterprises that underwent significant reductions in earnings due to the COVID crisis could postpone the payment of social insurance contributions for up to six months. As the financial pressure on certain industries continued, reduction of contributions for unemployment insurance and work injury insurance was extended until April 2021 (ISSA 2020b).

Japan

Measures applied:

- Horizontal expansion (employment retention)
- Vertical expansion (employment retention)
- Other adaptative measure (relaxation of qualifying conditions for an employment retention scheme)

As part of its COVID-19 response, Japan expanded its employment adjustment subsidy (Koyou Chousei Joseikin), a component of employment insurance scheme, which helped prevent enterprises from laying off their employees. This subsidy supported enterprises that were affected by reduced business activity and had therefore implemented temporary suspension of work while maintaining employment relationships. To be eligible for the subsidy, employers must provide a leave compensation equivalent to 60 per cent of previous wage to employees during the period of work suspension, and employers can then claim reimbursement from the scheme. The Government relaxed the qualifying conditions of the programme, and increased subsidies to reduce economic burdens on employers, if they met the requirement that their production had dropped by more than 5 per cent as compared to the same period in the previous year. The qualifying conditions were relaxed, and a similar expansion of the scheme was seen during the East Japan Earthquake, resulting in a significant increase in coverage (Tsuruga 2020b).

Belgium

Measures applied:

- Vertical expansion (employment retention)
- Other adaptative measure (contribution subsidy)

The temporary unemployment scheme (Tijdelijke werkloosheid) in Belgium covers employees during an economic crisis, or during hazards when employability is impacted by bad weather or an unforeseen event that renders companies forced to stop working. During the COVID-19 pandemic, the temporary unemployment allowance was raised to 70 per cent of past wages, instead of the regular 65 per cent. The Government paid the social security contributions for companies and self-employed persons for the first 18 months. Interest on late payments were exempted. Self-employed individuals were also supported through the unemployment allowance (ETUC 2020).

As seen in the country cases above, the choice of schemes for addressing crisis situations depends on a number of factors, such as the type of hazard, the maturity of the social protection system as a whole and social security in particular, fiscal capacity, the socio-economic context and the political landscape. Some key insights that can be drawn from the examples are presented in box 2 below.

Box 2. Key insights from international experiences on the use of social insurance for climate risks

- Adjustments and changes in qualifying conditions, benefit levels, duration and contribution rates vary from country to country, and depend largely on the legislative and institutional set up of the schemes, in addition to their financial capacity.
- Ex-ante preparedness of delivery systems and legislation to make provision for speedy adjustments are necessary for an efficient and cost-effective response.
- Ensuring continuity of business and employment with no disruptions to the routine provision of social insurance during climate-related disasters is crucial. Regular payments such as unemployment allowance or pensions should continue when disasters hit, and then expansion of schemes can be explored.
- Similarly, continued social security contributions are necessary, even during disasters. If and when employees/employers are unable to pay contributions due to the impacts of an event, some countries allow them to postpone the due date and/or allow for exemption from contributions. When contributions are exempted, it is important to implement measures to ensure continuous accumulation of contribution histories, especially in the case of pension schemes. The Government must consider actuarial recommendations to implement such an arrangement and also consider subsidizing costs.
- Reliable communication channels, online or in-kiosk application facilities, and face-to-face contact points are some of the infrastructural requirements essential for ensuring speedy interventions. In Asia and the Pacific, e-services and online services have ramped up as well, and electronic means of raising requests, claims and availing benefits were preferred to minimize in-person services (ISSA 2022).

- Many countries require declaration of a hazard for recognizing disasters as a potential cause for employment disruption and releasing assistance. In this case, clear definitions of what constitutes a disastrous event, including the magnitude and impact thresholds, should be pre-agreed upon through stakeholder consultations. In addition, clear standard operating protocols should be developed to clearly identify the roles, responsibilities and authorities of respective public institutions.
- To address impacts of climate-related disasters, the source of funds can vary by country. The government may inject ad hoc supplementary budgets to existing funds using the tax base, borrow from social insurance funds, or use existing funds (as in the case of Jamaica). The use of social insurance funds must be consulted with workers and employers and be carefully implemented so as not to undermine the financial sustainability and adequacy of benefits in the long run. Any such arrangements must follow actuarial recommendations.
- To address issues related to ad-hoc and ex-post funding of social protection in the case of extreme climate-related events, there is a need for layered and costed risk financing strategies with clear government contingent liability and instruments to be used based on the magnitude and frequency of events. Levering existing sovereign and sub-national risk retention and risk transfer instruments to channel funding through social protection schemes is also essential to support workers and employers so they can withstand and quickly recover from shocks.

Source: Compiled by the authors.

4.2. Climate change-related risks to social insurance schemes

The scope of this report is limited to the impacts of climate-related shocks on workers, employers and residents, and to responsive measures using social insurance schemes in times of crisis. However, it is important to note that further studies are needed to discuss how climate change-related risks will affect social insurance schemes, and what adaptive measures social security institutions need to adopt.

The principles of social insurance consist of the key mechanisms and structures, including collective financing and risk-pooling, universality and solidarity, adequacy and simplicity, and financial sustainability (Tsuruga et al. 2020), as follows:

- **Collective financing and risk-pooling:** Regular contributions are paid by workers and employers (and the government) and pooled. The resulting fund is used to cover the payment of unemployment benefits. Risk-pooling in social insurance is based on the principle of solidarity as opposed to individually calculated risk premiums. The advantages of such an approach are that it reinforces sustainability, improves adequacy and supports redistribution.
- **Universality and solidarity:** Extending coverage to larger groups of employees has a positive impact by creating wider risk pooling, increasing financial sustainability, promoting solidarity and reducing the overall contribution rate. In turn, such schemes reduce poverty and inequality and support social cohesion and economic growth.
- **Adequacy and simplicity of benefit formula:** Social insurance schemes are designed to ensure a minimum yet adequate level of benefits that are typically set as a percentage of the previous earnings of insured workers.

- **Financial sustainability:** A diversified financing approach between workers and employers (and the government) reduces financing risk and supports adequate benefits. The government is responsible for ensuring financial sustainability.

Climate change may prevent social insurance schemes from performing these functions. The International Social Security Association (ISSA)–ILO Guidelines on Actuarial Work for Social Security illustrate the principle roles of social security institutions and mechanisms in dealing with climate change-related risks (ISSA and ILO 2022). In the Guidelines, climate change-related risks are considered as part of catastrophic risks. In general, the principles underlying their management are the same as other risks. Yet, the importance of such risks may eventually require a dedicated approach to their management. Social security institutions should first identify the source and types of catastrophic risks that may affect both the scheme(s) and operational risks, followed by measuring frequency and severity, and mitigating risks. Box 3 presents examples of sources and types of catastrophic risks.

Box 3. Examples of sources and types of catastrophic risks

- Pandemics, other communicable diseases such as malaria and health emergencies;
- Environmental disasters including volcanic eruption, landslides, tsunamis and earthquakes;
- Severe and life-threatening soil/air/water pollution;
- The impacts of industrial accidents, chemical leaks, accidents at sea, and so on;
- Agricultural, including crop failure and loss of biodiversity;
- Other natural resource-related risks, including water and other natural resource scarcity, such as essential elements and minerals;
- Climate change-related risks, including increase in extreme events such as flooding, fires and droughts and their impacts (such as landslides), as well as longer-term changes such as sea level rises, which exacerbate a number of the events cited in this box;
- Technological, including cyber-attacks, ransomware, IT failure, data infrastructure failures, and similar;
- Biotechnology risks in the form of bioengineered organisms, including viruses, bacteria and animals that disrupt the ecosystem, whether by accident or design;
- Infrastructure failure, including those related to certain forms of energy production (nuclear, hydroelectric, and so on);
- External or internal conflict, warfare, arms development and terrorism; and
- Other external non-man-made risks including asteroid impact and solar winds impact.

Source: ISSA and ILO (2022).

Catastrophic shocks may create multiple risks to social security schemes. Some of the risks relevant to this report and related guidelines are abstracted below from the ISSA–ILO Guidelines (2022), including, most notably, benefit expenditure risk, financing risk and scheme objectives risk.

- The benefit expenditure risk is the possibility that benefit amounts paid will be greater than expected. The reasons why this may happen include differences between actual and expected benefit payments due to external factors, and changes in benefit rules, as well as higher than

anticipated administrative expenses. Treatment of risk should consider changes in benefit design, changes in investment strategy, preventive measures, and improving administrative efficiency as well as increasing involvement of all stakeholders. It is important to note that what would appear to be a reduction in expenditure risk through reducing benefits creates or increases other risks related to inadequate benefits.

- Financing risk relates to the possibility of having insufficient financial resources to meet obligations. This may result from lower employer and employee contribution income than expected, reduced government financial transfers or lower income from assets than expected. This risk is extremely important since it could lead to financial and intergenerational unsustainability of the scheme and major scheme changes. These changes could include changes in benefits and contribution levels as well as changes in financing approaches, as well as accounting for climate-related risks in investment portfolios, which could also affect the financial sustainability of the scheme.
- Scheme objectives risk is an important risk related to the social security system not meeting its objective to appropriately respond to life-cycle risks. This risk can include inadequate coverage of the population; providing benefits that are not adequate; or the provision of inappropriate benefits (benefits and services provided which do not meet the needs of the individual, the household or society as a whole leading to a suboptimal use of resources and the system not meeting its objectives). This may arise where the incentives created are inappropriate (such as, not facilitating return to work of the individual) or do not support wider aims of systems (for instance, labour force participation rates at older ages). In such situations, the risk related to the person covered is transferred out of the social security system to either the individual or another party through formal or informal supporting mechanisms. It is therefore important that the implications of other risk decisions taken on scheme objectives risk are considered.

By addressing these risks in permanent scheme designs, operating procedures and investment governance, social security institutions can comprehensively adapt social insurance schemes to climate change-related risks. Although this report focuses on temporary expansion measures to make social insurance schemes more effective and accessible in time of crisis, without due considerations on such a comprehensive scope, climate-related risks may not be fully addressed. For example, when a social security institution temporarily improves adequacy of benefits in disaster-affected areas, protection to affected workers will certainly improve. However, if the social security institution does not adapt its investment policy and governance, it may actually indirectly contribute to increasing the frequency and severity of climate-related shocks and stresses in the long term. In such a case, the social security institution may consider Environmental, Social, and Governance (ESG) investing. [12]

Actuarial valuations should be regularly conducted. Progressively, these periodic reviews should not only consider coverage, adequacy and financial sustainability, but also the projected impacts from climate change-related risks. This analysis within the actuarial valuation report or as a complement should use sensitivity analysis and scenario testing as tools to assess such impacts and to summarize them. Recommendations in response to such risks (such as the need to increase contribution rates) should be set out clearly in the report.

4.3. Social insurance in Indonesia for shock response

Some workers are especially vulnerable to climate risks; for instance, if they are engaged in natural resource-dependent livelihoods, are working outdoors and therefore more exposed to hazards, or they have limited capacity to cope with losses, which can exacerbate their poverty levels. In recent decades, poverty levels in Indonesia have reduced as the economy continued to grow rapidly. However, with a high population density in hazard prone areas, coupled with strong dependence on the country's natural resource base, the

12 Canada considers catastrophic risks, including climate change risks, in actuarial valuations (Canada, Office of the Superintendent of Financial Institutions and Office of the Chief Actuary 2022).

majority of Indonesia's population is exposed and vulnerable to the projected impacts of climate variability and climate change.

Around one-third of jobs in G20 countries, including Indonesia, rely on effectively managing and sustaining a healthy natural environment. Climate change has already resulted in net negative outcomes on jobs and labour productivity, and these impacts are expected to worsen in the coming decades (ILO 2018). As ASP is increasingly being discussed in Indonesia, it is important to explore the whole range of social protection instruments available, including social insurance, and to understand how they can form a part of the mix for a comprehensive country-led climate risk management strategy.

In this section, the research focuses on reviewing whether Indonesia's social insurance schemes have been used to address crisis situations in the past, especially the kinds of climate-related shocks and impacts described in Chapter 2 above.

While the country's social insurance schemes have hardly been scaled up or expanded to address climate risks in the past, Indonesia's state civil service (ASN) made provisions in February 2021 to allow civil servant employees who were affected by severe flooding in Jakarta to be able to take paid leave for one month to meet urgent needs. Civil servants who were not affected by flooding, but by the disaster overall, were also allowed to take paid leave for up to one month (Novi 2021).

The Global Financial Crisis, which started in late 2008, had economic repercussions that impacted almost every country in the world, including Indonesia. While none of the schemes under discussion in this study existed at that time, Indonesia undertook an expansionary fiscal policy, in the form of Fiscal Stimulus Packages (FSP), to mitigate the impacts of the crisis. The FSP had three main goals:

i. sustaining the purchasing power of people through income tax reductions;
ii. maintaining business resilience and competitiveness by providing tax cuts and incentives; and
iii. creating jobs and mitigating job losses through government infrastructure projects.

To achieve these objectives, a number of instruments were adopted, such as reductions in personal income and corporate tax rates, indirect tax cuts, budgetary reallocations, and government spending on infrastructure and cash transfers (Resosudarmo et al. 2021). The Government sought to achieve the first two goals of sustained purchasing power and maintaining business resilience through reduction in tax rates and the provision of subsidies and cash assistance. To achieve the third goal, the Government aimed at creating jobs and preventing dismissals through budgetary allocations into infrastructure for the control of natural disasters, multi-year projects, rail networks, water treatment plants, housing, power generation and transmission, rehabilitation of farming community roads, market ports and the construction of foodstuff warehouses (Indonesia, Ministry of Finance 2009). This shows that the Indonesian Government has had previous experience with adopting active labour market policies to facilitate labour market integration. Impact assessment of the FSP by Resosudarmo et al. (2021) has shown that the measures like personal income tax cuts, indirect tax cuts, and cash transfers had positive impacts on private consumption, and corporate income tax cuts stimulated the economy through increased investments.

The Government also launched a massive social assistance programme to address the impacts from COVID-19 and constituted the National Economic Recovery Fund. This social assistance programme included the Wage Subsidy Assistance scheme (BSU), Family Hope scheme (PKH), basic food/non-cash food assistance (BPNT), electricity discounts, tax breaks, a special micro-, small- and medium-sized enterprise (MSME) credit scheme, and the preemployment card and training programme, which prioritizes people who have lost their jobs (Indonesia, Ministry of Finance, n.d.).

The Wage Subsidy Assistance (Bantuan Subsidi Upah, or BSU) programme, a new scheme, was fully tax-funded by the Indonesian Government to reduce the socio-economic impacts of COVID-19 on wage workers who were active members of BPJS Employment. The initiative was aimed at maintaining the purchasing power of consumers during the pandemic. The subsidy programme was funded from the Budget Implementation List of Director-General for Industrial Relations and Social Security and from the reserve fund of the Ministry of Finance. The Ministry of Manpower is said to have worked together with BPJS Employment to ensure no duplication of recipients (Indonesia, Ministry of Manpower 2021).

Some adaptive measures were also introduced by the Indonesian Government to support workers and employers:

- leniency concerning the deadline for the monthly payments of JKK, JKM, JHT, and JP contributions;
- leniency concerning JKK and JKM contribution rates; and
- postponement of partial payment of JP contributions. [13]

13 Government Regulation No. 49 of 2020 regarding Adjustment of the Manpower Social Security Program Contribution during the Non-natural Disaster of the Spread of the Corona Virus Disease 2019 (COVID-19).

5. Potential role of social insurance in mitigating and reducing future climate-related risks in Indonesia

According to the Indonesian National Board for Disaster Management (BNPB), as climate change worsens, Indonesia will face an increasingly significant disaster risk, and will need to prepare for extreme weather conditions (Rustandi 2020). As per the calculations of the ND-GAIN Index 2020, Indonesia is recognized as vulnerable to climate change and its impacts, and ranked 97th out of 181 countries for vulnerability, because of a combination of political, geographic and social factors. The ND-GAIN Index 2020 argues that the legislations and actions currently being taken are leading the country in the right direction in responding effectively to climate change, however, the adaptation needs and urgency to act are even greater (University of Notre Dame, n.d.). Among the various strategies for adaptation, social protection schemes are also being explored as part of the mix, given that these systems generally have a large scope and scale, pre-existing institutional infrastructure with the capacity to reach numerous vulnerable households, and in general have a significant overlap in objectives with climate change adaptation goals (Agrawal et al. 2019).

As seen in the chapters above, different countries have been adapting and using social insurance schemes in several ways to cope with the impacts of climate, health and economic shocks. However, the evidence in literature on the use of such schemes in Indonesia for crisis situations is limited, especially for events resulting from climate risks. Based on the experiences from various countries, this chapter looks at the different policy, programmatic and implementation features of the three social insurance schemes under consideration and explore which of these components could be adapted in the event of a climate-related shock in Indonesia. It is noted that further analysis and discussion will be required to conclude any recommendations on policy reforms. In particular, any measures must follow actuarial recommendations.

Table 3 below has been adapted from the social protection “solar system” by Wyatt and Barca (2021). The highlighted cells identify the social insurance scheme components that have the potential to be adapted to make them flexible and scalable for climate risks. Further, the potential adaptations in general as well as specific to each scheme are elaborated and analysed to identify concrete and actionable entry points for such parametric changes.

Tabel 3. Framework for temporary adjustments of policy parameters of selected social insurance benefits in Indonesia

Social insurance system level	Social insurance system component	Social insurance scheme			Potential application of adaptive measures observed in international practices	Type of shock response
		Pension scheme (JP) – Old age benefit	Employment injury insurance (JKK) – Temporary disability benefit	Unemployment insurance (JKP)		
Policy	Legal and policy framework	Constitutionally recognized by Government Regulation No. 45/2015	Constitutionally recognized by Government Regulations Nos 44/2015, 82/2019 and 37/2021	Constitutionally recognized by Government Regulation No. 37/2021	Constitutional recognition of climate-related shocks as covered contingencies	Horizontal expansion, other adaptive measures
	Governance and coordination	Ministry of Manpower (policy) BPJS Employment (implementation)			Coordination with BNPB and Bappenas, provincial levels	Other adaptive measures
	Financing	Contributions from employer (2%) and employee (1%)	Contributions from employers ranging between 0.1% to 1.6%	Contributions by the Government (0.22%) and by the employer (0.24%)	Exemption, rescheduling, subsidies	Other adaptive measures
Programme design	Benefits	363,300–4,357,900 rupiah in 2022 (set at 300,000–3,600,000 rupiah per month in 2015, and indexed with inflation every year)	▶ 100% of wage (first 12 months), 50% wage after 12 months; ▶ Travel compensation; ▶ Healthcare benefits; ▶ Return to Work programme	▶ 45% of last reported salary for first 3 months, 25% for next 3 months; ▶ Career counselling, training	Top-ups, advance payments	Vertical expansion
	Eligibility criteria	Eligible after 15 years of contribution, after reaching 58 years of age	Employment injury incurred during work or commute	Involuntary termination; Contributions for 12 months out of last 24 months, including 6 consecutive months.	Relaxation of eligibility	Other adaptive measures
	Maximum duration	Benefits until death	Benefits until recovery	6 months	Extension of maximum duration	Other adaptive measures

Social insurance system level	Social insurance system component	Social insurance scheme			Potential application of adaptive measures observed in international practices	Type of shock response
		Pension scheme (JP) – Old age benefit	Employment injury insurance (JKK) – Temporary disability benefit	Unemployment insurance (JKP)		
Implementation and delivery	Information system	BPJS Employment database		BPJS Employment database and Ministry of Manpower database	Data sharing	Piggybacking
	Registration	Mandatory registration by employers	Mandatory registration by employers	Mandatory registration by employers	Improvement in accessibility, flexibility in registration timings	Other adaptive measures
	Provision of payments	Online claims and payments to bank accounts			n/a	n/a
	Accountability, case management and monitoring and evaluation	Responsibility of social security and labour inspectors			Relaxation of penalties, coordination between institutions	Other adaptive measures, Piggybacking

n/a = not applicable. Source: Adapted from Wyatt and Barca 2021.

Expanding on table 3 above, the following sections take a closer look at the pension, employment injury insurance and unemployment insurance schemes, and propose modifications and recommendations that can help make these schemes more adaptive, while contributing to social protection system strengthening.

5.1. Pension scheme (JP)

5.1.1. Legal and policy framework

The Law on the National Social Security System (No. 40 of 2004) provides for a comprehensive social security system based on the principles of humanity, equality and social justice. Climate change, today recognized as one of the biggest threats to human rights (World Future Council 2016), can obscure the path towards an adequately competent social security system that provides for all those in need. Including climate change as a threat to the Indonesian labour market and workers, and more broadly to the economy and people's wellbeing, and climate-related events as risks to be assessed and treated by social insurance schemes by updating relevant regulations could be a first step towards institutionally recognizing the challenge posed by climate risks and to opening up possibilities for specific modifications to the pension, employment injury insurance and unemployment insurance schemes, including scale-ups to previously uncovered workers.

The JP scheme, established under Government Regulation No. 45/2015, may recognize climate-related hazards as potential risks to pensioners, survivors, pensioner’s dependents, and persons with disabilities. The treatment of such risk should be an integral part of the overall risk management framework and process within the organization, and this should then be reflected directly in the different schemes of BPJS Employment in practical policy, management and financing measures.

Another provision within the law that could be useful is data sharing between BPJS Employment, BNPB, Bappenas and BMKG.

5.1.2. Benefits

The pension benefits received by older persons in Indonesia ranged between 363,300 and 4,357,900 rupiah per month in 2022. As the ILO has recommended in other reports, the current accrual rate of 1 per cent per year of contribution does not allow JP alone to fulfil the adequacy requirements of old-age benefits as per the ILO Social Security (Minimum Standards) Convention, 1952 (No. 102) (Plamondon, Phan and Brimblecombe, forthcoming; ILO 2017). Measures should be taken to improve the permanent design of JP as well as an additional scheme or arrangements for expansion to provide all residents with old-age benefits, disability benefits and survivors benefits.

In response to climate-related shocks, some countries temporarily improve benefits in affected regions. For example, pensioners in climate-affected regions may be granted top-ups or advance payment of pensions to reduce the hardships resulting from shocks. These temporary measures could be accompanied by or coordinated with other public schemes, such as energy subsidies during hazards like heatwaves. Likewise, benefit levels could also be increased with top-ups or advance payment for disability pensions, widow/er allowances, survivor allowances and children/parent allowances.

In general, a temporary increase in the level of benefits could be one way to improve protection of insured members exceptionally in affected regions. Yet, as discussed in the previous section, the priority must be given to improving the adequacy of benefits in permanent policy designs. If schemes guarantee adequate benefits and collect sufficient contributions for financial sustainability in normal times, pensioners may have better coping capacity during times of crisis.

To make temporary adjustments to improve benefits (such as temporary increases to pensions), the scheme must have collected enough contributions to build up adequate reserves in order to finance these temporarily improved benefits by using excess funds during a time of crisis. The social security system should take this into account in setting its financing and funding policy (Brimblecombe, unpublished).

Under the current circumstances, for Indonesia to implement a temporary vertical expansion, advance payment may be a more realistic option than top-ups. Unless the State subsidizes top-ups, the JP contributory fund may not be financially sustainable with the current level of contribution rates.

5.1.3. Coverage and eligibility

The JP scheme is currently compulsory for wage workers in large and medium enterprises, and voluntary for small and micro enterprises. JP does not cover non-wage workers and only covers a small share of wage workers in small and micro-enterprises. To fill gaps in protection, the ILO recently recommended the extension of mandatory coverage to all wage workers in Indonesia and the establishment of a universal pension scheme to provide all older persons with a pension (Plamondon, Phan and Brimblecombe, forthcoming). Increasing the coverage of a scheme is a key element of building up the shock responsiveness of that social security scheme.

In the JP scheme, pensioners are currently eligible for old-age benefits after 15 years of contribution, and after reaching 58 years of age (as of 2023). The ILO recently recommended eliminating the requirement to accumulate a minimum of 15 years of contribution for eligibility to the old-age pension, and instead to provide proportionate pensions (Plamondon, Phan and Brimblecombe, forthcoming). Moreover, under present JP provisions, a survivor is entitled to receive 50 per cent of the old-age or disability pension that the deceased was receiving or entitled to receive. If, for example, the old-age pension is equal to 40 per cent of the salary, then the widow/ers' pension will be equal to only 20 per cent of the salary of the deceased. The ILO proposed to establish a minimum survivors' pension set at 40 per cent of the minimum wage. These suggested reforms in the permanent design will help affected insured members and survivors in a time of crisis.

If the State opts for top-up to or advance payment of pensions to temporarily expand protection of older persons affected by climate-related shocks, it must consider the abovementioned reforms of the permanent policy design in parallel. Without the permanent policy design being improved, such temporary adaptive measures would not be as effective as they could be.

5.2. Employment injury insurance (JKK)

5.2.1. Legal and policy framework

According to Government Regulation No. 44/2015 on the Implementation of the Work Accident and Death Insurance Programme, JKK is a benefit in the form of cash, health and rehabilitation services provided when participants experience employment injury or diseases caused by the work environment. A constitutional amendment to include climate risk related injuries and illnesses when a worker is present in their work environment, can be a first step in recognizing the role of JKK in covering for such events. To implement this, it is necessary to assess what the climate-related risks for the scheme is. For example, in which industries and what type of climate-related events are likely to increase the number of claims and their severity.

5.2.2. Benefits

The current policy of JKK does not fulfil the requirements of ILO Convention No. 102, and therefore, an improvement in the permanent scheme is important to support additional temporary adjustments in times of crisis. The State should then ensure that all the benefits provided under the JKK scheme can be extended to protect insured members affected by climate-related hazards, including through cash support, job training, rehabilitation services and medical/healthcare services, as well as survivors benefits for widow/ers and children. If the JKK scheme is reformed according to Convention No. 102, insured workers injured at workplaces affected by climate-related shocks will be protected until they recover.

Currently, JKK provides health benefits in the form of unlimited medical and treatment costs according to medical needs in the event of an "accident or occupational disease". The benefit, after necessary regulatory adjustments, could also include medical and treatment costs for accidents, diseases and illnesses due to climate-related hazards, and in that case, information on the range of health impacts for workers exposed to different climate risks will be an important area of research.

JKK also provides the temporary disability benefit (STMB) at 100 per cent wage levels for the first 12 months, after which it drops down to 50 per cent from the 13th month. There can be relaxations to this benefit allowance in case a hazard occurs in the 13th month. Scholarship benefits are also provided for the children of workers who have died or have become totally disabled due to a work accident. A temporary expansion to this scheme could be to provide temporary top-up benefits for a few months (or more if needed, depending on the intensity of the event impacts) when a worker is affected by climate-related hazards.

5.2.3. Coverage and eligibility

In terms of coverage, by law and regulations, JKK requires all workers to register. This means that all wage workers in large-, medium-, small- and micro-sized enterprises and all non-wage workers (such as self-employed, platform workers, and freelancers) must be registered under JKK. Since it is already mandated that all workers are covered by JKK, the next step in ensuring higher participation rates is to improve compliance so that more workers take up membership.

5.3. Unemployment insurance (JKP)

5.3.1. Legal and policy framework

The JKP scheme established under Government Regulation No.37/2021 could explicitly recognize climate-related shocks as a potential cause of unemployment. The Labour Law No. 13/2003 allows employers to dismiss their employees if they have to close down their enterprises due to force majeure. However, Government Regulation No.37/2021 does not stipulate what kinds of force majeure can be considered in the JKP scheme. Similarly, neither the Labour Law nor the Government Regulation provide grounds for worker's protection when it comes to resignation due to just cause or climate-related hazards – that is, whether such a resignation is considered as voluntary or involuntary termination.

Covered contingencies may explicitly include unemployment due to climate-related hazards. For example, under the current law and regulation, it is not clear whether an insured worker will be entitled to cash benefits if they resign from wage work suspended until further notice because the workplace is destroyed by flood. If the scheme by regulation explicitly covered such a resignation as resignation with just cause or involuntary termination of employment, the scheme could more effectively and efficiently protect affected workers in times of climate-related shocks.

5.3.2. Benefits

Unemployment insurance schemes play important roles across the world in times of crisis in general. Many States implement protective and preventative measures using tax and insurance funds when a crisis occurs, and effectively combine unemployment benefits and active labour market policies.

By construction, JKP could contribute to providing temporary and partial income replacement for workers who lost jobs due to shocks. Apart from providing cash support, the JKP scheme provides career counselling and training for labour market integration. The local manpower office may help the jobseekers through job matching services or by supporting out migration and integration of workers into other areas where jobs are available. The training programmes aim to upskill and reskill workers to meet future requirements as the country makes a transition. It is important to ensure an effective operational linkage among these services in affected areas. Single window services and the ability to refer JKP recipients to these services must be accessible in time of crisis.

JKP could potentially play an important role in mitigating hazards' impacts and facilitating employment promotion. Like JKK and JP, the permanent policy design of JKP has room for improvements as discussed in the previous section. Some countries implement a temporary increase in benefits and an extension of benefit duration for insured members in affected regions in a time of crisis. Moreover, in the future once the scheme has become slightly more matured, the State could consider adding a relocation allowance, lodging allowance, transport or moving allowance, or a transport allowance for attending job interviews in other places. Another programme could be an employment retention programme or wage subsidy scheme, which would aim to prevent unemployment by providing partial income replacement for insured members whose employers temporarily shut down workplaces due to hazards or economic shocks while keeping the employment relationship in place. [14] Such additional benefits or programmes could utilize different models, such as the short-time work programme in Germany (IMF 2020), the employment adjustment subsidy in Japan (Tsuruga 2020b), and the employment retention scheme in the Republic of Korea (Chung 2021).

5.3.3. Coverage and eligibility

As a first step, it is recommended that the permanent policy design of JKP be reformed by extending mandatory coverage to all forms of wage workers. The current legal coverage is limited to being mandatory for wage workers in small-, medium-, and large-sized enterprises and voluntary to wage workers in micro-enterprises. Moreover, at the moment, construction workers are collectively registered only with JKK for each project they work on. Once they have been registered with JKK for their current project, they are not permitted to participate in other schemes like JP or JKP. If their construction sites were destroyed and largely affected by climate-related shocks and their projects were suspended, construction workers may become at risk of unemployment. As they are not permitted to enrol in JKP, unemployment benefits will not be provided to them during unemployment spells. While it is primarily important to reform the permanent scheme of JKP to include these construction workers, it will also benefit them to increase access to other forms of public support. For example, the local manpower office may actively provide unemployed construction workers uninsured by JKP with public employment services to facilitate return to work or referral to vocational training, and public works programmes could offer immediate and temporary job opportunities.

Some countries adopt a temporary expansion measure to relax the contribution record required for benefit eligibility in a time of crisis. For example, if Indonesia adopted such a measure, the JKP contribution requirement could be reduced from the current 12 months out of last 24 months. It is important to note that the permanent design of the JKP scheme with the requirement of six consecutive months of contributions potentially excludes seasonal workers and other workers with short-term contracts, and would need to be modified in order to protect these workers. A priority should be given to addressing such a restriction.

14 In the long-run, Indonesia may consider adding an employment retention scheme to prevent unemployment. According to the ISSA (2020a), the major objectives of such schemes are to:

- support enterprises to adapt working hours and staff costs to sudden fluctuations in economic activity and demand;
- maintain existing employment relations and prevent large job losses;
- protect the income of workers, thereby reducing poverty and preserving purchasing power and consumption;
- avoid the loss of skilled and experienced workers at company level, and allow for a rapid return to increased activity once demand increases; and
- increase solidarity by sharing the costs of the crisis across different sectors.

Another temporary measure could be to relax requirements for continuation of benefits. JKP recipients must continue meeting requirements for continuation of benefits every month. To prove their willingness to work, availability and capability for work, they must submit job applications at least five times or participate in one job interview every month. In disaster-affected regions where the entire labour market and infrastructure are severely damaged, active job search may become more challenging than during normal times, especially when the availability of employment opportunities has drastically decreased due to hazards. Thus, relaxing these conditions for continuation of benefits may prevent JKP recipients from suspension of benefits in a time of crisis.

5.4. Common adaptive measures

5.4.1. Financing and contributions

In response to climate-related shocks, some countries exempt, reduce, reschedule or subsidize contributions for workers and residents in affected areas. Indonesia also implemented such a measure during the COVID-19 crisis. The contributions in such cases are often either temporarily rescheduled or suspended, and substituted by government subsidies that in turn can be funded through risk financing instruments. In any cases, such responsive measures should not affect the accumulation of pension entitlements or the financial sustainability of the pension fund. The timing of when contribution requirements are to be relaxed and for how long may depend on the intensity and extent of the impacts from the hazard, and in some cases, relaxations could be needed for several months.

Regular actuarial valuations are essential not only to ensure financial sustainability, but also to discuss and determine adaptive measures. In Indonesia, an actuarial valuation and a revision in contribution rates are not regularly implemented. For example, at present, JP is financed by contributions from employers and employees, at a rate of 2 per cent and 1 per cent of the monthly wage, respectively. However, ILO actuarial studies show that the current contribution rates for JP cannot provide insured persons with adequate level of benefits or will not be financially sustainable in the long term, and therefore recommended an increase in benefits and contribution rates (Plamondon, Phan and Brimblecombe, forthcoming; ILO 2017). However, the JP contribution rates have never been reformed since the establishment of the pension scheme in 2015. In the absence of regular actuarial valuations and reforms in policy designs, exemptions or reductions of contributions in response to climate-related shocks may risk the viability of the JP fund.

For wage workers, JKK is financed by contributions from employers ranging between 0.1 per cent to 1.6 per cent of the worker's wage (plus fixed allowances) depending on the risk level of the industry. For non-wage workers, the contribution rate ranges between 10,000 and 207,000 rupiah, depending on their income. For construction workers, this rate is set at 0.21 per cent of the project value. However, the current policy design of JKK does not fully meet the requirements of ILO Convention No. 102. For example, under the Convention, permanent disability benefits must be provided as long as the contingency lasts, instead of the current lump-sum benefits provided. Whenever the State considers a change in the contribution rate, the State must conduct an actuarial valuation and improve the benefits to be in accordance with international labour standards. Under the circumstances, priority should be given to the improvement of the permanent benefit design of JKK. Then, according to actuarial recommendations, adaptive measures to climate-related shocks can be considered.

These measures consist of changing one or several parameters including:

- substantially increasing the budgetary envelope earmarked for partial unemployment and short-term work;
- relaxing eligibility requirements, such as the reduction in the minimum required number of employees on short-term work in a company;
- the lowering of the minimum required working time reduction, or the reduction or waiving of waiting periods;
- extension of eligibility to contract and temporary workers;
- increase in benefit levels;
- payment of social security contributions for workers on partial unemployment or short-term work by the unemployment insurance or the government; and
- active promotion of schemes by social security institutions, and flexibility regarding administrative requirements in the application process.

JKP is financed by contributions from the Government (0.22 per cent) and employers (0.24 per cent). The current policy design does not meet the requirements of Convention No. 102 in many ways. For example, it does allow some vulnerable categories of workers to enjoy benefits, including construction workers, fixed-term employees whose contracts expire, domestic workers, or seasonal workers who cannot fulfil the qualifying condition of six consecutive months of employment prior to employment termination. According to a recent ILO actuarial study, an effective policy design that includes covering wider populations, providing more adequate benefits and removing the required consecutive months of employment would require higher contribution rates than the current rate (Landry and Brimblecombe 2021). After reforming the permanent scheme design of JKP to be in line with international labour standards, the State may find that the current contribution rate is unable to support temporary exemptions or rescheduling of contribution payments in response to climate-related shocks.

5.4.2. Information systems

Currently, Law No. 24/2011 provides the institutional framework for the implementation of the social security system, including the roles and responsibilities of BPJS Employment as the mandated body for the implementation of social insurance schemes. BPJS Employment hosts its own employment database that includes information on all registered participants in JP, JKK, and JKP. [15]

An important requirement when responding to climate change-related shocks in an emergency situation is to ensure access to accurate data on affected participants. While information on the location of participants is available to BPJS Employment in their information systems, laws and regulations could instruct BPJS Employment and relevant agencies like the BMKG to cooperate and share information on affected postal codes every time certain climate-related shocks hit. This is an example of piggybacking on an existing established information system that the BMKG might have in order to reduce the time needed to identify affected participants and offer support through the three social insurance schemes.

While it is possible to make online applications for the relevant schemes, adaptation measures that allow applications and claim requests through temporary kiosks, telephones and SMS in areas where internet connections are disrupted could be explored to increase accessibility and business continuity during climate-related shocks.

The Social and Economic Register (SER) is currently being developed in Indonesia, which will contain information on residents, including demographics, employment status, livelihood type, socio-economic status, assistance received, and their locations. The SER is expected to eventually have full coverage, with information on all households in Indonesia. Such an integrated single registry can be crucial in enabling adaptive social protection systems in the country. This single registry can also be updated with data from BNPB and BMKG, to add information on climate risks and future trends. In the future, BPJS Employment may be also benefited from this registry by connecting to its administrative database.

5.4.3. Registration

Mandatory registration is to be done by employers for the JP, JKK and JKP schemes, within 30 days from the day of employment. A measure to improve accessibility to registration must be considered in a post-disaster context. Late registration without penalty is one of the common measures observed from international practices when employers affected by hazards do not have access to the infrastructure for registration.

15 BPJS Employment does not have individual data of JKK members who are collectively registered by construction projects.

5.4.4. Accountability, case management, and monitoring and evaluation

BPJS Employment is responsible for enforcing employers' compliance with social security registration of their employees, and imposing sanctions and fines in case of non-compliance and delays. BPJS Employment could also offer additional support with case management during disasters by allocating human resources for speedy solutions to grievances raised.

In case any of the above-mentioned expansions or any other adaptive measures are introduced to address climate-related hazards, BPJS Employment could organize monitoring and evaluation exercises that assess continuity of regular social insurance services.

For JP, investment governance of the pension fund is an important issue to be addressed in the context of climate change risks. The social security institution and its fund must be accountable for its investment strategy, and their investments should not contribute to increasing the frequency and severity of climate-related shocks.

For JKK, Minister of Manpower Regulations Nos 26/2015, 44/2015 and 1/2016 require employers of wage workers and non-wage workers themselves to report to BPJS Employment within 48 hours from the incidence of work injuries or disease. This reporting requirement within 48 hours could be relaxed depending on the severity of the hazard, such as where employers and non-wage workers cannot access BPJS Employment branch offices or the online system to report the incidences.

For JKP, as BPJS Employment monitors and evaluates claims being raised for unemployment, it may be useful to analyse whether trends or patterns emerge on which sectors/livelihoods are regularly experiencing layoffs and terminations, so as to determine whether this is resulting from the phasing out of certain industries and sectors in keeping with a Just Transition. Understanding which sectors might require more support in addressing unemployment will be beneficial for BPJS Employment in providing adequate protection and progressively targeting certain industries as they extend coverage.

5.5. Governing and implementing adaptive measures

In summary, for each of the schemes in Indonesia, several adaptive measures could be learned from international practices. Financial implications vary for different adjustments. It will be essential, therefore, for the Government to conduct regular actuarial valuations, consult with employers and workers, and finally stipulate these adaptive measures in laws and regulations.

In terms of institutional and regulatory mechanisms, there are existing tripartite bodies to facilitate such dialogues. The management and governance of social insurance schemes in Indonesia is under the supervision and monitoring of tripartite bodies. The National Social Security Council (DJSN) is responsible for social security issues, and the national tripartite committee (LKS Tripnas) is responsible for labour issues. These bodies have tripartite representatives from workers' organization, employers' organization and the Government. By law and regulation, both the DJSN and LKS Tripnas are responsible for monitoring issues and providing recommendations to the government. The BPJS Employment Board of Supervisors also consists of tripartite representatives who govern the implementation and management of BPJS Employment schemes and funds. In coordination with relevant ministries, these tripartite institutions must play an active role to facilitate social dialogue, reach consensus and regulate adaptive measures.

The roles of the BNPB and BMKG are also essential to bring together social protection, climate change adaptation and disaster risk management agencies, in an attempt to make social insurance schemes adaptive. More concretely, the predetermined temporary expansions or adjustments to the social insurance schemes must be activated by responsible institutions or authorities. In this regard, the BNPB is a mandated

authority to monitor and track disaster risk in the country, supported by data provided by the BMKG. The President of Indonesia declares a national emergency when a disaster crosses a certain threshold, on the recommendation from the BNPB. These institutions and authorities could potentially play a role to activate the adaptive measures. Then, at that point, the predetermined adaptive measures would be activated and implemented by BPJS Employment.

At present, such an institutional arrangement does not exist. Limited administrative cooperation between BNPB and BPJS Employment appears to be only the case of institutional collaboration. According to interviews conducted with BPJS Employment for this study, provisions already exist to share data between BNPB and BPJS Employment for the protection for fishermen affected by disasters like boat accidents in the sea. Affected workers are entitled to receive occupational accident recovery in such cases. For worker deaths at the workplace during disasters like earthquakes, BPJS Employment provides JKK survivors' benefits and death benefits (JKM), and has previously received support from BNPB with regard to data used to identify insured workers.

For the Government to activate and implement temporary adjustments of its social insurance schemes to increase protection of workers affected by disasters, a comprehensive strategy must be established through laws and regulations. These may clearly define:

i. what disasters and what level of severity activate adaptive measures for each social insurance scheme;
ii. what adaptive measures are activated;
iii. in which locations the adaptive measures are to be activated;
iv. what sources of funds can cover a cost increase in social insurance funds;
v. what roles the Government, BPJS Employment, and BNPB will play,
vi. what authority each institution involved is to be given; and
vii. what data need to be shared to relevant institutions to ensure quick and efficient interventions.

Any temporary adaptive measurers should also be reviewed by actuarial analysis and be implemented together with a strategy to recover potential loss of contribution income or to increase benefit expenditure of the funds, including the State's commitment on allocating tax reserves to the funds later. For example, if the State plans to subsidize the loss of contribution income borne by waiver or rescheduling of contribution collection, the State must consider and regulate how it will compensate the loss of contribution income of BPJS Employment. If the State transfers general tax revenues to financial balance sheets of BPJS Employment, it will be also an issue to be regulated as to whether the State will record this transaction as temporary borrowing from concerned schemes, and in what timeline the State will pay back the debts to the funds considering the budget approval process at the Government and the Parliament.

All these arrangements must be regulated in advance and can be triggered by the declaration of emergency by the responsible government agency, or by setting up automatic triggers linked to parametric adjustments to improve protection in time of crisis. Once an emergency is declared by the Government, BPJS Employment and relevant government agencies in charge of the response would immediately take action following the predetermined strategies and arrangements without relying on ad hoc coordination and decision-making processes.

If not already existing, regular communication channels and platforms for exchanging data, information, areas of operation and plans for interventions among BPJS Employment, BMKG, BNPB and related ministries like the Ministry of Manpower and Ministry of Finance should also be established.

Moreover, as the three social insurance schemes are expanded to account for climate-related risks and to respond to climate-related hazards, it will be necessary to ensure that:

i. support reaches the insured participants;
ii. grievance redressal mechanisms are available and accessible; and
iii. consistent and regular monitoring and evaluation are conducted to evaluate whether the modified schemes are effective and having the intended impacts.

As responses to climate risks using social insurance schemes will mainly be short-term in nature, the monitoring and evaluation can be conducted as part of or in collaboration with regular actuarial valuations of BPJS Employment every two or three years, as stipulated by regulations.

6. Recommendations

Indonesia is developing the 2025–2045 National Long-Term Development Plan (Rencana Pembangunan Jangka Panjang Nasional: RPJPN) as well as a comprehensive strategy on Adaptive Social Protection. This report aims to contribute to the discussions and support these developments.

Overall, the following general recommendations are made:

1. Indicators to activate temporary expansion of social insurance schemes may be determined. Foundational research is needed for understanding climate risks, the sources and skills of available forecast data, group specific needs and vulnerabilities, impact pathways, and the projected duration and intensity of the hazards. Such analysis on climate risks will help the Government identify indicators to declare an emergency and to activate temporary expansion measures to the social insurance schemes.
2. The permanent design of social insurance schemes must be improved. The current policy designs for the JKK, JP and JKP schemes have several limitations concerning coverage, adequacy and financial sustainability. The ILO has provided recommendations for improvements in separate reports.
3. Workers, employers and the Government, possibly through existing tripartite mechanisms, may discuss, identify and agree on adequate temporary expansion measures for the social insurance schemes; indicators to trigger the declaration of an emergency and therefore trigger the predetermined expansion measures; and any other issues necessary for establishing legal grounds in laws and regulations to implement such arrangements.
4. Under current regulations, the existing social insurance schemes are set to be reviewed every two to three years. However, it is not clear whether the Government implements actuarial valuations within this timeframe, because results are not publicly available. Actuarial valuations should be regularly conducted. Progressively, the periodic reviews should not only consider coverage, adequacy and financial sustainability, but also climate change scenarios and respective risks and projected impacts. This analysis within the actuarial valuation report or as a complement should use sensitivity analysis and scenario testing as tools to assess such impacts and to summarize them. Institutions may want to consider a standardized climate-reporting framework to drive structured analysis of risks and opportunities. Recommendations in response to such risks (such as the need to increase contribution rates) should be set out clearly in the report.
5. As the temporary expansion of the schemes may require tax funds, it is necessary to consider the fiscal envelope, the risk financing strategy and the priorities of the Government. Institutions will also have to take adaptation costs and potential losses and damages from climate change into account and incorporate these into their (investment) plans.
6. Strengthening communication, promotion and marketing, and concrete messaging around the benefits of the social insurance schemes are necessary to improve uptake rates, along with improving implementation components like registration, payments and grievance redressal. Strengthened communication will improve knowledge of workers and residents on how social insurance schemes could help them in time of crisis. This also applies to contingency plans to ensure continuity and resilience of social protection services under those circumstances. In order also identify, assess, prepare for and address longer-term climate-related risks and actions needed, institutions may need to develop integrated overall climate action plans (including contingency planning).

7. As the Social and Economic Registry is being developed, it may be useful to explore ways in which data can be interoperable among different ministries, especially BPJS Employment through the Ministry of Manpower, and among external stakeholders like humanitarian actors and donors intending to undertake disaster response. Provisions could be made to share data on request to help target workers better.

Concerning the three specific schemes, a number of possible temporary measures to improve protection in disaster affected areas are discussed in the report. Major highlights are as follows:

1. For all three schemes, temporary adaptive measures in policies and operations may help improve protection. Some of the common expansion measures include: top-ups or extension of benefits duration; reschedule or exemption of contribution payments during or after the disaster; relaxation of eligibility requirements to increase the number of beneficiaries; and improving administrative capacity to ensure accessibility to the benefits.
2. The JP scheme is designed to benefit older persons, persons with disabilities due to non-work-related incidences and survivors of the deceased. Some countries top-up or pay these benefits in advance on being affected by climate-related hazards. This requires easy access through necessary administrative measures, especially in disaster-prone and -affected areas.
3. The JKK scheme is designed to provide for workers affected by occupational diseases, injuries and death through a cash benefit, medical care, rehabilitation and return-to-work support. It must be ensured that the scheme covers work injury or death due to climate-related shocks.
4. The JKP scheme is well-placed to prolong income compensation when a worker is unable to find job due to unforeseen circumstances following a disaster. Covered contingencies may explicitly include unemployment due to climate-related hazards. For example, under the current law and regulation, it is not clear whether an insured worker will be entitled to cash benefits if they resign from wage work that has been suspended until further notice because the workplace is destroyed by flood. A temporary expansion of benefit amount and duration may help increase protection of affected workers, while relaxing requirements for contributions and continuation of benefits during disaster periods will contribute to temporarily expanding beneficiaries. Moreover, providing a relocation allowance, lodging allowance, transport or moving allowance, or transport allowance for attending job interviews in other places, as well as a new employment retention scheme can be considered in the future.
5. Major differences between climate risk management and COVID-19 pandemic response measures would be the timespan involved and the populations affected. The number of insured members affected by each shock may be smaller for disaster responses, which may result in lower budgetary implications than the pandemic, especially since most of the disasters will be localized in nature with limited numbers of casualties. However, climate-related shocks may happen more frequently and with different levels of severity, and disaster response measures must be generally put in place immediately (that is, within a few days to weeks). In this regard, accumulated social insurance funds and predetermined and transparent qualifying conditions will help insured members immediately self-target themselves and claim benefits. While the Government prepares for ad hoc tax-funded measures, budget approvals and operations, social insurance schemes could help insured members immediately by following business as usual procedures.
6. Any of these adjustments must be implemented with actuarial recommendations and must be monitored and assessed by regular actuarial valuations. Cost implications may vary by frequency and severity of disasters, the number of insured members in affected regions, and the adaptive measures taken. It is also noted that the ILO has recommended to improve the benefits and financial sustainability of the permanent policy designs for the three schemes (Plamondon, Phan and Brimblecombe, forthcoming; Landry and Brimblecombe 2021; ILO 2017). Therefore, temporary adaptation measures must be discussed while considering improvements to the permanent policy designs.

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