7 Putting environment and climate action at heart of job creation and security

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Covid-19 caused one of the largest shocks to Malaysia's sustainable development trajectory. It posed major challenges for the country's economy, health and societal wellbeing and in the process, derailed progress towards achieving the Sustainable Development Goals (SDGs). The magnitude of the impacts exposed the country's systemic vulnerabilities and has reoriented risk-based thinking to cope with future risks at the national level – including the threats posed by climate change and ecological crises. Experts and commentators have linked these crises, as well as the Covid-19 pandemic, to a human disconnect with nature as the root cause. The result has been a massive deterioration in environmental quality, food and water insecurity, heightened natural disaster risks, and major threats to human health.

The potential emergence of zoonotic diseases highlights the importance for humanity to live within a "safe operating space", which is the capacity of our planet to provide life-support systems and the need for us to stay within planetary boundaries.[1] There has since been a growing realisation that business-as-usual norms are not equipped to facilitate a critical sustainability shift to mitigate these developments, thus raising the urgency for a collective agenda that promotes climate action and sustainability transitions.

This chapter thus explores the implications of the changes catalysed by the pandemic on Malaysia's sustainable development trajectory. The reorientation of risk-based thinking, the country's growing recognition of climate action and its commitment to sustainability transitions will be assessed from two aspects: first, how the transition to a green economy will shift the landscape of the labour market in terms of job creation and losses, especially for high greenhouse gas emitting sectors, such as coal and oil and gas. Second, how climate hazards and environmental degradation have affected the economy, businesses and workers during the pandemic. This chapter underlines the importance of incorporating environmental and climate action into Malaysia's labour policy to ensure job creation and worker protection and concludes with policy recommendations towards strengthening the nation's climate resilience as it navigates an increasingly unpredictable 21st century.

1.0 Covid-19 and the reorientation towards risk-based thinking and green growth

For the past 20 years, experts have warned that the degradation and destruction of ecosystems as well as the loss of biodiversity could foster the emergence of new viruses and zoonotic diseases.[2] It is estimated that 31% of emerging infectious disease (EID) outbreaks, such as Ebola, Nipah and the Zika virus, were closely related to habitat loss and deforestation.[3] The Global Risk Report 2021 survey indicated that infectious diseases are one of the top five risks by likelihood alongside extreme weather, climate action failure, human environmental damage and biodiversity loss. As such, the spatial, temporal, as well as the severity of disease aspects vary around the world because of climate change. This may also contribute to the emergence of new or rather ancient zoonoses.[4] The drivers of pandemics are frequently also the drivers of biodiversity loss and climate change, and these two intricately linked systemic challenges have only grown in intensity in recent years.

The effects have been devastating: the Covid-19 pandemic exposed various systemic vulnerabilities and deep-rooted issues across the economic, social and governance landscape. It serves as a sobering reminder to respect the earth's planetary boundaries and continue the

discourse and action on sustainable development. In response, it has become a key policy move globally to use green and resilient growth to cope with climate change impacts and extreme weather events, especially to address future risks and seize the opportunity to build back better in the endemic period.

Echoing this trend, the Malaysian government has introduced various green measures to spearhead the transition towards a green economy. In Budget 2021, former prime minister Tan Sri Muhyiddin Yassin acknowledged the "promising path of green recovery" to spur economic growth and societal wellbeing while also enhancing climate resilience and low-carbon efforts.[5] In the budget, a sustainable focus was instituted, alongside a slew of climate-friendly initiatives. These took the form of supply chain and technology-focused programmes designed to support the nation's environmental, social and governance (ESG) ecosystem, localisation of the SDGs, steps towards improving the domestic green financing ecosystem, and mechanisms to support biodiversity conservation and protection, among others.[6] Budget 2022 subsequently maintained this emphasis on sustainability.[7]

Within this, green growth and sustainability efforts have been a national priority since the late 2000s, with the passing of climate-focused policies. These are the National Policy on Climate Change, National Renewable Energy Policy and Action Plan, establishment of the Sustainable Energy Development Authority and a variety of economic and financial instruments, such as the feed-in tariff, green technology financing schemes and green investment tax allowance. This emphasis appears to have gained greater weight and urgency in the Covid era.

It is against this backdrop that the ESG agenda has become a significant focus in Malaysia, driven by actions at the firm-level by statutory bodies, such as Bursa Malaysia (stock exchange) and Bank Negara Malaysia (BNM – central bank), as well as industry and professional coalitions. Much of this reorientation of risk-based thinking occurred in 2021. BNM launched the climate change and principle-based taxonomy in April with the goal of assisting financial institutions assessing and categorising economic activities based on their climate friendliness,

resource efficiency, biodiversity and ecosystem conservation.[8] The central bank also standardised the classification and reporting of climate-risk exposure to encourage climate financing. Meanwhile, Bursa launched "financing4ESG" in November, an initiative designed to encourage ESG practices across listed companies, building on previous efforts to improve sustainability reporting and support the Task Force on Climate-related Financial Disclosures (TCFD). The emphasis on ESG and sustainability is linked to broader global movements to address climate change.

These can be traced back to the 2015 Paris Agreement, which established a coordinated, global desire to limit global warming to "well below 2° Celsius" above the pre-industrial average. In the years since, many countries and companies have set a slew of ambitious nationally determined contributions (NDCs), low-carbon energy and "net-zero by 2050" targets. These changes are usually accompanied by policy, regulatory, technological and market shifts that pose impacts for the economy. According to BNM, if Malaysia fails to comply with transition risks, it will lose US$65.3 billion in annual export revenue.[9]

2.0 Renewed interest in climate policy

The 12th Malaysia Plan (12MP), launched in September 2021, included initiatives geared towards low-carbon development and proposed the deployment and enhancement of climate economic instruments, such as carbon pricing, ecological fiscal transfers and payments for ecosystem services.[10] 12MP also coincided with the announcement of Malaysia's net-zero target, following in the footsteps of a growing number of private sector entities, including Petronas, the state oil and gas company, and Tenaga Nasional Berhad, Malaysia's largest electricity utility.

Malaysia also increased its NDC to the Paris Agreement, pledged to reduce deforestation and methane emissions by 2030, and committed to halt the construction of new coal-fired power plants at the long-delayed COP26 in late 2021. In accordance with the 12MP, the government would develop a domestic emissions trading scheme, carbon tax and voluntary carbon market (VCM).[11] As part of its international climate obligations, the Environment and Water Ministry (KASA) would review and update

the National Climate Change Policy, develop the NDC road map and long-term low emissions development strategy (LT-LEDS).[12]

2.1 Jobs driven by green transition, sustainability and ESG

The demand for green jobs spiked when discourse surrounding sustainability transitions and the ESG agenda came to the forefront during the pandemic. The International Labour Organisation (ILO) defines green jobs as "jobs that reduce the environmental impact of enterprises and economic sectors, ultimately to a level that is sustainable while also meeting requirements of decent work – adequate wages, safe conditions, workers' rights, social dialogue and social protection".[13] Robert Walters, a leading headhunting and recruitment agency in Malaysia, anticipates more hiring around ESG, especially in the financial services, commerce and manufacturing sectors.[14] This correlates with the findings of a study by SBR, which show that demand for ESG jobs in Malaysia increased by 986% compared to pre-pandemic levels, the highest in Asia compared with other countries, such as India (468%), Hong Kong (442%) and Singapore (257%).[15]

The government has also increased efforts to promote more green jobs. Besides increasing enablers and instruments for accelerating green economy financing and investments, KASA launched a job portal[16] in 2021 as a one-stop centre for jobs related to technical specialities in six sectors – energy, water, waste, building, transportation and manufacturing – to support the target of providing more than 200,000 green jobs by 2030.[17]

More broadly, investment in the green economy should be viewed as addressing three issues simultaneously: achieving greater emission reductions and mitigating Malaysia's contribution to climate change; enhancing actions which contribute to increased resilience to the effects of climate change; and creating sustainable, long-term jobs in a strategic sector that will form a cornerstone of the global economy in the coming decades. In Malaysia, four sectors stand to benefit from a policy tilt in favour of the creation of green jobs: energy (renewable energy [RE] industries), transport, waste management and agriculture.

An emphasis on investment in RE is imperative as the nation strives to achieve its targets of reaching an RE-installed capacity share of 31% by 2025 and 40% by 2035 as per the Malaysia RE road map (MyRER)[18] and a total installed capacity of 18,431MW by 2040 (the current installed-RE capacity amounts to just under 7,600MW).[19] As the climate ambition grows in tandem with the effects of climate change, these targets will only be revised upwards. This creates scope for investment that promotes local production and deployment of RE – particularly solar and biofuel because of their abundance.

In terms of the labour market impacts resulting from green jobs, evidence indicates an average of 6.5 million direct, indirect or induced jobs will be created per annual GWh of electricity generated from solar PV sources.[20] The UK Energy Research Centre estimates that a further 21.6 job years of "short-term" jobs are likely to be created per MWp of installed capacity during the construction phases of solar PV projects.[21] If the same formula is applied, should Malaysia reach its RE target depending solely on solar energy, it is estimated that this would generate at least 311,000 to 350,000 new jobs.[22] Of this figure, roughly 234,000 would come in the form of short-term jobs during the construction phases. Job creation for biomass lags that of solar energy: 6.4 job years of short-term construction jobs are created per MWp, and between 0.5 and 1.1 jobs created per annual GWh generated.[23] Meeting a quarter of Malaysia's targeted installed-RE capacity of 31% increase using biomass (roughly 2,700 MW) would create between 29,100 and 43,300 jobs, with 17,000 being short-term construction jobs.

In the transport sector, three strategies can culminate in the creation of both climate-related benefits and job creation. They include local production of fuel-efficient cars and electric vehicles, improvements to public transport and improvements to pedestrian and bicycle infrastructure in urban areas. Estimating with any precision the number of jobs created through these transport-related initiatives, however, is a complex endeavour. But it is relatively straightforward to envision how pro-climate policies, including the imposition of fuel economy standards for internal combustion engine vehicles (ICEVs) and incentives for local automakers to produce and assemble components for electric vehicles

and fuel-efficient ICEVs can create highly skilled and highly paid jobs in the automotive industry.

Improvements to public transport infrastructure, meanwhile, can spur activity in domestic construction, while increasing investment can serve to boost the labour market. The construction industry would benefit from investments earmarked for improving the condition of Malaysian roads, particularly in cities, including retrofitting certain areas with dedicated bicycle and bus lanes and steps to improve pedestrian infrastructure. Such initiatives would likely have knock-on effects across other sectors that are dependent on context and, therefore, difficult to project with any precision.

A policy emphasis should be placed on increasing recycling rates for commercial, industrial and residential sectors. While conventional waste collection and landfill disposal creates one job per 1,000 tonnes of waste material managed, recycling – depending on the material(s) in question – creates anywhere from six to 13 jobs per 1,000 tonnes of waste.[24] Emphasis in Malaysia should be placed on improving rates of recycling for metals and electronics, which fit towards the upper end of the job creation range. Labour market benefits can be realised should the government provide access to cheap financing for companies to build new or expand existing sorting and recycling facilities for such waste, a process that will create specialised long-term jobs.

The increasing trends of electronic and metal consumption would only add to this figure, especially with the emphasis on boosting the digital economy. Jobs and positive environmental impacts can also be created through the promotion of waste-to-energy initiatives, such as the commissioning of gasification plants and anaerobic digesters, in addition to the focus on the use of biofuels as a form of RE. This focus could create higher-skilled jobs, both in the construction and operation of such plants and combined with action to promote recycling rates can contribute to enhancing "circularity".

Opportunities also abound for the creation of sustainable, long-term jobs in the low-carbon sphere across industries. The onus is on the

government to issue policy instruments that drive investment in low-carbon technology domestically and contribute to its increased deployment. This is pertinent, given the global economic context of recent years, beginning with the onset of Covid-19 and the resulting economic lockdowns and supply chain shocks, which contributed to inflation and global recession. With Malaysia signalling greater climate ambition through its focus on increasing the capacity of RE, the enhancement of domestic and international climate targets and its aim to introduce carbon pricing, a rapid and sustained growth in green job creation is sure to follow.

2.2 Climate hazards and environmental risks on economy, labour market

Jobs plus our economic and societal wellbeing rely on our natural environment for ecosystem services, such as clean air, food, water purification, recreation, pollination and other benefits.[25] They play an important role supporting the economy and labour market, especially in some sectors.

The oil palm pollinating weevil, for example, is critical for the oil palm sector, which generates RM108.52 billion in export revenue[26] while flying foxes are important pollinators for durian trees.[27] In the worst-case scenario of a partial ecosystem collapse, Malaysia's GDP could contract by 6% per year by 2030, in comparison to a baseline scenario.[28] These effects will be felt most acutely in natural resource-based sectors, such as agriculture, fisheries and forestry, which account for 7.1% of GDP and directly employ nearly one million people, primarily in rural areas.[29]

To compound matters, climate risks are only growing in urgency. The Covid-19 virus is a type of environmental risk that brought to light long-standing environmental issues, such as ecosystem exploitation, agricultural intensification and climate change, which altogether increase the likelihood of future zoonoses emerging.[30] Further, the exploitation and unsustainable use of natural resources, such as excessive deforestation, illegal land clearing, overfishing and poaching, frequently result in pollution, biodiversity loss and increased disaster risk, which

have disruptive effects on local communities' and their livelihoods – particularly in poorer and rural areas. The marine and fisheries sector, which exemplifies the "tragedy of the commons", is an example that is frequently overlooked in sustainability policies and discourse. The latest fish stock assessment shows that Malaysian fish stocks have been exploited beyond maximum sustainable yield and have yet to recover[31] and this has been linked to an increase in fish prices during the pandemic. The impacts are being felt by the country's most vulnerable. For example, in Johor, the combined effects of the pandemic, rising sea levels, lack of government support and diminishing catch have hit Tg Kupang's small-scale and artisanal fishermen badly.[32]

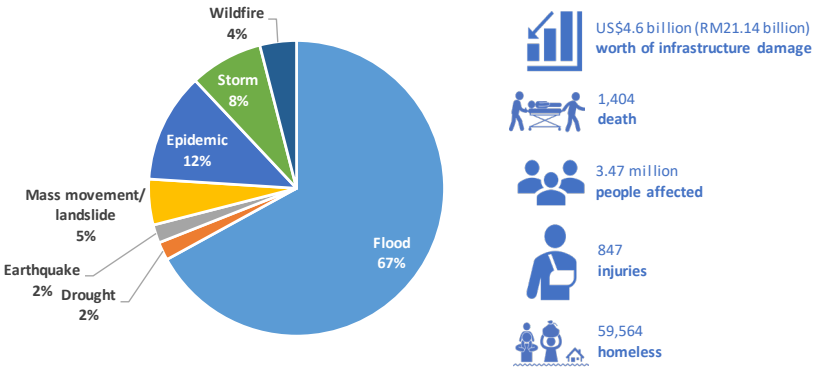
Then there is global warming, a human-induced climate change, that has also resulted in changes in the temporal and spatial distribution of climate hazards, such as floods, droughts and heatwaves. Scientific consensus confirms that the exponential increase in greenhouse gases in the atmosphere between 1850 and 1900 had resulted in 1.2°C of warming compared with the pre-industrial period.[33] During the pandemic, the Intergovernmental Panel on Climate Change (IPCC) released a series of sixth assessment reports. They found that climate impacts were more widespread and severe than scientists first thought and that current commitments and policies are nowhere near meeting the Paris Agreement target.[34] After a slight drop in global CO_2 emissions in the first half of 2020,[35] the numbers rose quickly as the global economy gradually recovered.[36]

But environmental and climate-related risks were not uncommon in Malaysia prior to Covid-19. Malaysia's geographic location and relatively lower poverty rates mean both its risk and vulnerability to natural hazards are comparatively lower than most of its Southeast Asian neighbours.[37] However, the effects of climate change have been observed in Malaysia, with increased mean temperature, annual rainfall and sea level rises.[38] Natural disasters, especially floods, are not uncommon (box 7.1) and several extreme weather events such as floods were recorded during the pandemic (table 7.1).

According to the ILO, climate change poses significant risks and has had a negative impact on employment in a variety of sectors and regions (see figure 7.2). However, two limitations must be considered when determining the true extent of the impact of climate change on employment and the labour market in Malaysia. First, the relationship between climate change and labour markets is a relatively new research area, so existing literature is limited. Second, because of a lack of disaggregated data on disaster and climate risks, the stated impacts may not be documented adequately. Even if available, the data may be difficult to access or dispersed across government domains. Nonetheless, data from stakeholder reports and anecdotal evidence from local communities show how climate change affects workers, with major implications for policymaking.

Box 7.1: Major disasters in Malaysia (1980-2021)

Based on international statistics, there have been 95 major disasters related to geophysical and climate-related events in Malaysia since 1980. Annually, floods account for the most frequent and significant damage and are responsible for the highest number of human lives lost, disease spreads, property and crop damage, and other losses. On the other hand, despite the low frequencies of drought, more than two million people were affected during the 2014 drought.



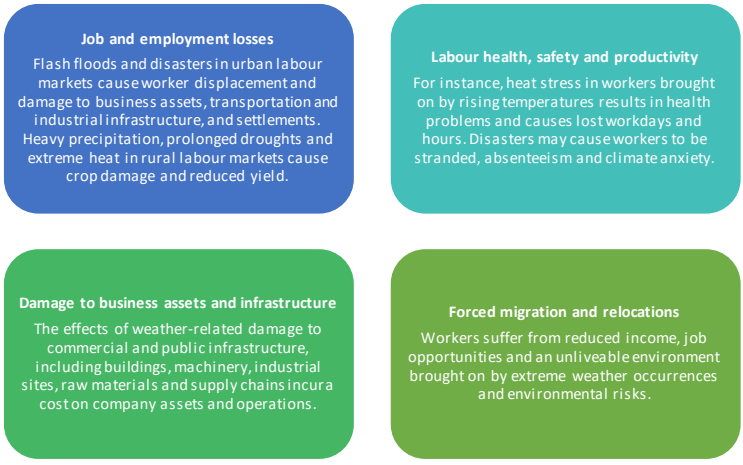
Source: International disaster database by the Centre for Research on the Epidemiology of Disasters[39]
Note: Only disaster events that conform to one of the four following criteria are recorded in the graphic above: i) 10 or more people dead, ii) 100 or more people affected, iii) the declaration of a state of emergency, iv) a call for international assistance. Therefore, these records may differ from government disaster records.

Table 7.1: Major natural disasters during the pandemic

Event	Date	Location	Description	Impacts
2021-2022 Floods	Dec 2021-Jan 2022	Klang Valley and 8 states in the peninsula	• Tropical depression of Typhoon Rai made landfall in the peninsula, resulting in a 'one-in-100-year flood' – a month's worth of rainfall fell in 24 hours. • Unusual as it took place in the economic hub of the country – Klang Valley – a region that rarely receives torrential rainfall.	• RM5.3-6.5 billion (government estimations), RM20 billion (unofficial estimations) • 55 deaths • 2 missing • About 71,000 displaced • Nearly 130,000 affected
Debris flood (*banjir puing*)	4 Jul 2022	Gg Inas, Baling, Kedah	• Main factors included cascading geological process combined with heavy rain, landslides, debris flows and floods, and mud floods. • Land use change and deforestation added to impact.	• RM25.91 million losses • 3 deaths • 17 destroyed houses • 3,546 villagers affected
	18 Aug 2021	Gg Jerai, Yan, Kedah		• 6 deaths • 1,000 affected

Source: Government reports and newspaper clips
Note: This list is not exhaustive but provides indications of types of disaster during the pandemic

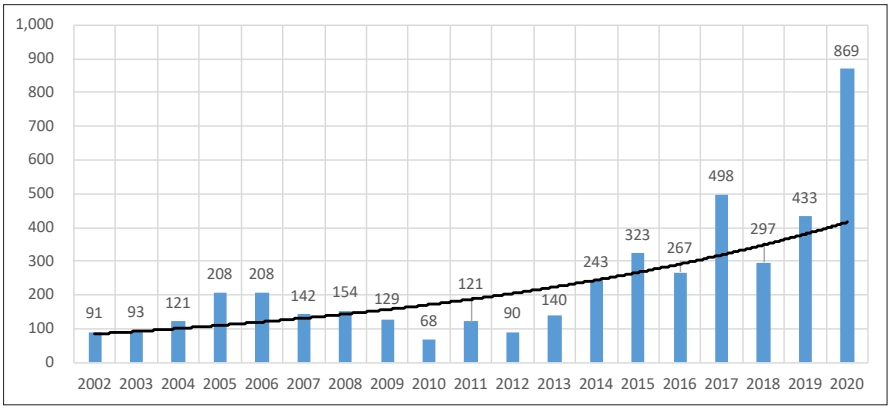
Figure 7.1: General impacts of climate change on labour markets



Natural disasters and environmental degradation can create ripple effects across individuals and organisations. In Malaysia, the effects of disasters are frequently discussed in terms of hard costs, such as billions of ringgit on recovery and rebuilding – but the link between climate risks and human resources is rarely considered. In general, severe weather events can result in decreased productivity, increased absenteeism and higher turnover. It is difficult for employees to come to work when they have lost their homes or forced to evacuate. It is also difficult to be productive when natural disasters threaten financial stability. While some employees can navigate these situations, many cannot, particularly entry-level workers and junior staff. Poor policies and practice by companies can also aggravate negative effects for workers. During the 2021-2022 floods, there were reports of flood-hit employees being forced back to work with no access to emergency leave and threatened with pay cuts or termination.[40]

Climate and environmental risks in Malaysia are not uniform across economic sectors and geography. They depend on type of climate hazards and how they interact with local exposure and climate vulnerabilities. In the context of labour, the impacts of climate hazards such as flooding, droughts or heat waves differ across various interlinked dimensions, such as economic sectors, job types, workplace, sex, age and income level. For example, climate risks are bigger in cities because of Malaysia's 77% urbanisation rate and its high concentration of communities, economic

Figure 7.2: Number of flood reports (2002-2020)



Source: Department of Irrigation and Drainage, 2021

activities and infrastructure.[41] In addition, communities in high-risk areas, such as low-lying flood-prone areas, riverbanks and coastal areas, are also more exposed to natural hazards.

Flooding has the most wide-ranging impact on population. According to the National Disaster Management Agency (NADMA), five million Malaysians or 21% of the population live in flood-prone areas. When factoring in urban flash floods, at least 67% of the population is at risk of flooding, the highest among Asean member states.[42] During the pandemic, there was a record increase in the occurrence of flash floods in urban areas and the outskirts. Official flood reports have increased exponentially in the last two decades, with 2020 recording twice the number of flood events compared to the previous year (figure 7.1). These risks have been exacerbated by local factors, such as rapid urbanisation, ineffective drainage systems, deforestation and logging, which reduce permeability and natural sponge capacity.[43]

In rural areas and near highlands, there were increased occurrence of debris flood (*banjir puing*), a natural geological phenomenon induced by landslides and water surge that is often compounded by increased sedimentation from logging and monoculture plantations.[44] There have been 25 recorded events of debris flood since 1990 but four were recorded in 2021 and 2022 alone.[45] Besides the loss of lives and houses, and the rise in displaced people, communities in Gg Inai and Gg Jerai in Kedah also lost their farmlands and aquaculture farms. Experts foresee more such disasters over the next decade because of changing rainfall patterns.

Slow-onset events, such as heat and rising sea levels, pose an equal if not greater risk to Malaysia's population, making certain members of the workforce more vulnerable. Temperatures have been steadily rising in Malaysia since the 1990s, with land surface temperatures in five major cities of Kuala Lumpur, Georgetown, Ipoh, Bayan Lepas and Johor Bahru rising between 1.64°C and 6.75°C over the last few decades due to urban heat-island effects.[46] Workers particularly vulnerable to heat and hot weather include fishermen, farmers, construction workers and delivery drivers.[47] Blue-collar workers, already in the low-income demographic, are particularly vulnerable to heat-related illnesses,

notably heatstroke because of prolonged exposure, long working hours, poor working conditions and abuse by employers.[48] Informal workers, such as stateless foreign labour and refugees, may even be subjected to longer working hours.[49]

Rising sea levels also threaten the livelihoods of coastal communities in Kedah, Johor, Penang, Terengganu and Sabah.[50] During the pandemic, the All-Party Parliamentary Group on SDGs in 2021 discovered that sea level rise and sand mining along the Malacca Strait have resulted in land loss, degradation and saltwater intrusion, with major impacts on agricultural yield in Muar, Johor. Warming seas have also altered fish migration patterns in some areas of the South China Sea and the Johor Strait, affecting small-scale fishermen's income and fish prices.[51]

The effects of climate change on the economy and labour markets extend beyond national borders. Globalisation has resulted in singular node events posing cascading effects on the global economy, including trade-dependent nations like Malaysia. A combination labour shortage from the pandemic, the Russia-Ukraine war and a prolonged dry spell in Argentina and Brazil, where Malaysia relies on for 90% of corn imports to produce chicken feed, resulted in an increase in chicken prices because of the limited supply of feedstock. As such, a climate lens is necessary in the creation of and policymaking for the labour market.

In general, the rise of natural disasters or unmanaged natural hazards that turn into disasters during pandemics threaten to exacerbate poverty and inequality. This acutely hurts low-income earners in sectors that rely heavily on climatic conditions, such as agriculture and fishing, and those employed in informal sectors without formal social protection. As such, climate change cannot be viewed as a standalone issue since its impacts are often amplified by other global risks, such as ecological crises, rising inequalities, conflicts and protectionist policies. Against this backdrop, future threats on the horizon risk exacerbating these conditions. Policymakers will thus need to consider the following major factors in efforts to build sustainable and resilient labour markets:

- **The bleak future climate trajectory and its socioeconomic impacts:** the latest projection by the IPCC found that in almost all emission

scenarios, warming is expected to exceed the 1.5°C threshold by the early 2030s. Based on the Paris Agreement commitment to reduce emission, the world is on track to reach from 2.4-2.6°C warming by the end of the century,[52] which has major implications for Malaysia's economic trajectory and labour market, especially as Malaysia sits in one of the most vulnerable regions to climate change in Southeast Asia.[53] More extreme floods, prolonged droughts, rising sea levels and heatwaves will soon be the new norm. It is estimated that by 2030, the nation will lose 2% of working time to heat stress, which translates to productivity loss equivalent to 80 million jobs.[54]

- **Inadequate resilience and adaptation planning:** during the pandemic, Malaysia made great strides responding to climate issues with the government setting the target to be a carbon-neutral nation as early as 2050 and consideration of market-based instruments such as carbon pricing. However, for a long time, Malaysian climate discourse and initiatives have always focused on mitigation[55] and low-carbon development. Yet the increasing frequency of extreme weather events and their consequences highlight the critical need for climate adaptation[56] to cope with the worst effects of climate change, reduce loss and damage, and protect workers, particularly vulnerable groups. The positive news is that adaptation is increasingly being incorporated into development plans, such as the five-year plan and the national physical plan. Nonetheless, Malaysia still lacks an overarching and comprehensive adaptation policy. Despite being in the works since 2015, the national adaptation plan has yet to be formulated.
- **Social protection gaps:** protection for businesses and workers against climate-related disasters and natural disaster events is lacking in terms of policies and financing. While Malaysia has various labour standards and laws in place, such as the Occupational Safety and Health Act 1994 and the Employees' Social Security Act 1969, they do not adequately address the specific issue of climate shocks and slow-onset events. These risks have a clear impact on the safety and health of workers in numerous sectors.

A lack of financial protection against natural disasters due to underinsurance is a major gap in Malaysia. While awareness of disaster risks may be higher among large corporate and public institutions, small and medium enterprises (SMEs), homeowners and vehicle owners tend to underestimate these challenges. According to an AIG Malaysia study, only 15% of SMEs have purchased flood insurance, implying that more than 80% are unprotected. It is further estimated that 74% of Malaysian homeowners are not insured against floods, leaving at least two out of 10 households in flood-prone areas uninsured. The uptake rate for vehicle disaster insurance is even lower since these require additional premiums for "special perils", such as landslides, floods and other natural disasters. According to the General Insurance Association of Malaysia (PIAM), as of 2020, only 4% of vehicle owners have flood coverage, with cost cited as the main reason for the low uptake. Allianz Bank indicates that only 11% of its 1.11 million customers purchased protection against "special perils" but that in the aftermath of the 2021/22 floods, uptake increased to 22%.[57]

This low penetration rate reflects the underlying reasons flood insurance is not widely bought. A survey by Malaysian Reinsurance Berhad and Faber Consulting found that while insurance for floods is widely available, many view them as a last resort, and this does not exclude the government.[58] While there has been limited research on this topic in Malaysia, some studies attribute this to a low "perceived risk" of disaster, a lack of affordable insurance products among low-income groups, charity hazards[59] and insufficient marketing by insurance providers.[60] But insurance demand is also heavily influenced by the government's willingness to support and compensate the low-income population for disaster-related losses. This is despite evidence that bailouts were insufficient to compensate the B40 segment for its losses.

Poor uptake of insurance and low penetration rate will result in increased vulnerability especially among B40 groups and informal workers as they lack the capacity and means to recover from disasters. The lack of disaster coverage among communities may require the government to increase its allocation for disaster welfare aid, which may affect fiscal sustainability as the government navigates a tight fiscal space post-Covid, a bleak economic outlook and a rise in climate-related disasters.

3.0 Conclusion and policy recommendations

Climate resilience in the post-Covid era must be inclusive to ensure that no one is left behind. As the world transitions to a low-carbon future, there is a need to ensure that it is a just transition in which certain groups are not discriminated against, resulting in the loss of jobs and sources of livelihood, while propelling green growth as a new engine for job creation. Second, climate policies must prioritise risk-based planning and disaster-risk financing to protect the labour force, particularly vulnerable groups significantly disadvantaged in dealing with the effects of climate change. At the crux of it, we need to pursue policies that place climate change at the heart of job creation to pave the way for a sustainable future.

1. **Develop a holistic educational curriculum to support the upskilling or training of workforce to become sustainability and ESG professionals.** This effort starts with an emphasis on climate change and sustainability for youth, and must be integrated into university and graduate-level courses, programmes on climate change and sustainability, and training courses for professionals. To meet the high demand for ESG and sustainability related jobs, the government should invest to ensure enough labour to support the nation's low-carbon aspirations. This will enable the private sector, too, to enhance its contributions towards climate action.

2. **Focus on job creation and technological deployment within low-carbon electricity, transport and waste.** Low-carbon industries provide a significant opportunity for growth and employment, particularly given the ongoing global emphasis on decarbonisation. As one of the largest producers of solar panels, and a significant source of biofuels largely through the oil palm industry, there is potential for greater job creation and technological deployment within low-carbon energy industries. This energy transition, coupled with an emphasis on low-carbon transportation initiatives – most notably through local automotive manufacturers, such as Proton and Perodua – can also create sustainable jobs in the transport sector. Finally, there is room for improvement in the waste sector, which contributes just under a tenth of national emissions, particularly in the areas of methane emission reductions and the circular economy.

- **Reinforce Malaysia's position as a global leader in the production of photovoltaic panels:** with the solar industry already relatively established in Malaysia, the government should focus on the creation of domestically owned "national champions". Emphasis should be placed on expanding the production and generation capacity of solar energy across the country and positioning Malaysia as a global leader in cutting-edge photovoltaic R&D and production.
- **Provide low-cost financing and other incentives for the domestic production of electric vehicles (EVs), including buses, cars, motorcycles and EV components:** these incentives should be targeted at automakers, such as Perodua and Proton. Such an approach could create the conditions to support the development of low-cost, domestically produced mass-market EVs which can hasten vehicle fleet electrification. It can also support job creation in an industry driving the low-carbon transport transition, and may even facilitate Malaysia's growth towards becoming a key global supplier of affordable EVs, particularly to other developing markets.
- **Invest in the creation and improvement of infrastructure for pedestrians and cyclists**: such a move could create collective health benefits while extensive and safe pedestrian pathways and bicycle lanes can address last-mile connectivity and traffic congestion. This would also support economic activity, increase productivity and create jobs in the construction industry.

3. **Undertake comprehensive risk and vulnerability assessments for major economic sectors and labour markets.** While the government has conducted some preliminary risk and vulnerability assessments on key sectors, such as agriculture, which includes major crops and critical infrastructure, the extent of climate change impacts on other primary, secondary and tertiary sectors, as well as associated workforce and labour trends, has yet to be assessed fully. As such, systematically evaluating the risk and vulnerability of these sectors will serve as a starting point for embedding climate-related risks across all sectors and undertaking risk-based planning. The

data will also be useful in assisting the private sector in publicly disclosing climate-related considerations in accordance with the TCFD recommendations, which will be made mandatory in 2025.

4. **Revise existing legislations and policies on labour to include specifics of climate change and disaster risk.** Some legal instruments need to be revised to address climate change challenges. The upcoming climate change legal framework under study by KASA needs to integrate environmental risk and labour-related objectives. The Occupational Safety and Health Act 1994, as the apex legislation to protect workers, can include the provision of conducting periodic assessments of new risks related to climate change, improve, adapt, or develop and create awareness of standards for technologies and work processes related to the transition and review policies concerning the protection of workers. Adaptation solutions and policies, such as flexible working arrangements and allowing a minimum amount of emergency leave during and post-disaster, should be explored. But assessments are needed to ensure these policies are context specific based on jobs.[61]

5. **Formulate comprehensive national climate adaptation and disaster-risk financing strategy, including climate-risk financial instruments.** Public spending on flood mitigation has increased significantly across subsequent Malaysia Plans, from RM14 million in 1970[62] to more than RM15 billion in 2022. KASA estimates that more than RM300 billion is needed to address long-term flooding issues,[63] with most of the funds going towards infrastructure development. Government expenditure on social support and financial aid through extra budgetary funds has also increased in tandem, as relief and response have always been the primary focus of Malaysia's disaster-risk management.[64]

   As flash floods and natural disasters become increasingly common and unpredictable, there is an urgent need to finance disaster risk in a more economically efficient manner and prevent market failures that increase disaster risks. A comprehensive disaster-risk financing strategy is required, which outlines the most optimal financial instruments that the government can utilise to decide which risks

to retain and transfer, such as catastrophe bonds, parametric insurance, national disaster funds or using revenue generated from market-based environmental policy instruments, such as carbon tax and polluter tax.

To protect labour and workers, disaster- and climate-risk insurance is an effective tool that has been adopted worldwide as it is a versatile and low-cost economic device. First, the government can provide incentives to boost uptake and pool resources to develop a climate-risk insurance market. To assure affordability and eliminate moral hazards, subsidies should be income-based, with higher subsidies for the B40 group. Second, develop a national public insurance scheme through residual markets to cover individuals or companies that are unable or unwilling to purchase private insurance, such as the US national flood insurance programme and UK national flood programme.

Climate-risk insurance can improve social protection, but it is not the only risk management strategy. It must be incorporated into a wider disaster-risk management strategy and support efforts to improve adaptation. Insurance is supposed to enhance economic efficiency by spreading risks, but not necessarily reducing loss and damage. This means that a disaster risk management approach in Malaysia must be more holistic addressing the entire disaster-risk cycle, particularly by taking actions to ensure natural hazards do not escalate into disasters. This can be achieved by investing in resilient infrastructure, nature-based solutions and community-based disaster-risk management.

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