SUSTAINABLE INSURANCE FACILITY (SIF): Solutions to Build Resilient Micro, Small and Medium Enterprises

HIGH-LEVEL V20 NEEDS AND SUPPORT ASSESSMENT

DRAFT

V20

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I. BACKGROUND

The Vulnerable Group of Twenty (V20) Ministers of Finance from 48 countries is a dedicated dialogue and action platform that works on financial responses to maintain and strengthen fiscal stability and economic resilience in the face of intensifying climate impacts. This includes addressing investments to enable climate-proof growth, reduce exposure to transition risks, enhance efforts on climate-related financial disclosure and carbon-pricing approaches, as well as tackling increasing cost of investment capital due to climate vulnerability, and building systematic, climate-smart insurance for micro, small and medium enterprises in the Global South.

The Sustainable Insurance Facility (SIF) is focusing on the realization of this latter objective. It is intended to address the V20 need for stronger private sector engagement and action on both ends, the demand and supply side of climate-smart insurance solutions to ensure financial protection and enable productivity. Climate-smart in this context refers to insurance products which enable low carbon investments as well as insurance products which provide protection from climate risks. The target group selected by the V20 – MSMEs – was identified due to their substantial contributions they make to GDP, employment, tax revenue, exports, and thereby strengthened fiscal health, financial stability, and socio-economic development. At the same time, MSMEs are highly vulnerable to climate change and increasingly threatened in their productivity, leading to severe ripple effects for people's livelihoods dependent on MSMEs and knock-on effects to the wider economy.

In light of this, the V20 has identified **three key rationales** that underpin the need for protection against climate risks, including **(1) maintaining and enhancing socio-economic resilience and human development**, including through strong and consistent employment opportunities as well as social protection for the vulnerable, **(2) strengthening national productivity**, including by enabling better credit access, efficiency and investment security and **(3) reducing pressure on public spending ex post disaster** to maintain fiscal and financial stability, including with regard to international capital markets by ensuring fewer implicit contingent liabilities, continued tax revenue, and fewer negative effects to GDP.

Currently, **the SIF is the vehicle via which the V20 Group voices their demand** for climate-smart MSME insurance. Depending on what is needed, the **SIF might evolve as a platform that**

coordinates the scaling up of existing international and regional initiatives, programs, and financing vehicles in a tailored fashion that captures and addresses the demand on the ground. To initiate that process, MCII conducted the High-Level V20 Needs and Support Assessment, focusing on the circumstances in V20 countries and mapping currently existing programs and financing vehicles that address some of problems that lie at the core of the SIF. The Assessment providesd the basis for the "**SIF V20 Operationalization Framework**", which will outline draft programmatic areas to guide activities that can realize the implementation objectives of the SIF, partner engagement and the ecosystem required to enable successful implementation. Moreover, this document is intended to serve as a discussion basis to identify financing actors and other key stakeholders to engage with for further consultation.

HIGH-LEVEL V20 NEEDS ASSESSMENT - OBJECTIVES

The "**V20 Needs Snapshot**" seeks to develop a synoptic overview of the current situation in V20 member countries by scoping and understanding **the V20 MSME landscape and climate-smart insurance experience and potential.** The mapping of the landscape will include currently existing products, projects, programmes, and initiatives.

Though the "V20 Needs Assessment" is **not an in-depth demand assessment** for each of the countries' MSME sectors, detailing specific product requirements and/or specific capacity needs for product development and provision, it is the first step before a more detailed assessment would be taken up at the country-level. Rather, the **overarching objective is to build a case supporting the demand** for climate-smart MSME insurance by **broadly addressing questions** concerning the **vulnerability of MSMEs in V20 economies**, the **need for financial protection**, the **lack thereof** and the **underlying nature of the problem/s** substantiating the latter. **More specifically**, this "V20 Needs Snapshot" seeks to

(1) Provide an overview of the countries' MSMEs' composition and socio-economic role (GDP and source of employment);

(2) Highlight the climate vulnerability of MSMEs across the V20 and their coping strategies;

(3) Highlight the (prospective) GHG emission trajectories of MSMEs across the V20;

(4) Demonstrate MSME's instrumental role for domestic development and the positive, socio-economic implications of increasing MSMEs' climate resilience and GHG-mitigation through introducing climate-smart MSME insurance products;

(5) Identify existing national regulations and policy frameworks specifically aimed at increasing financial inclusion regarding MSMEs

(6) Provide a high-level assessment of the potential benefit of climate-smart insurance solutions for MSMEs and their availability in V20 insurance markets

(7) Highlight some of the specific needs and barriers related to climate-smart MSME insurance through mini case studies for selected V20 member countries with different market structures and different development stages regarding the use and provision of financial services.

(8) Discuss the ecosystem needed to scale and sustain future MSME protection initiatives.

HIGH-LEVEL V20 SUPPORT ASSESSMENT - OBJECTIVES

As of now, no concerted effort exists to address specifically the climate-smart MSME insurance gap in V20 economies. To **scope the existing supply of support**, **projects**, **and products** aimed at increasing private uptake of climate-smart insurance on both the demand and the supply side, and to explore options for enhancing a coordinated and collaborative approach, the "**V20 Support Assessment**" will map ongoing efforts such as key financing vehicles as well as general research platforms and technical assistance initiatives. Though the "V20 Support Snapshot" is **not an in-depth assessment of specific activities**, it csn **provide a high-level snapshot of the actor landscape** and their **priority action areas** pertaining to MSME finance and insurance, respectively. As such, this "V20 Support Snapshot" aims to

(1) Develop an overview of existing financing initiatives, including funds, facilities and financing programs at the international, regional and/or national levels;
(2) Highlight existing initiatives pertaining to technical assistance, focusing on training and capacity-building, market and product development, the creation of enabling regulatory environments, and integrated risk management for MSMEs, at the international, regional and/or national levels;
(3) Identify ongoing and relevant research networks in fields such as risk data and modeling, and MSME finance solutions;
(4) Highlight some initiatives and approaches specifically promising for the SIF context as well as remaining gaps in need of action.

METHODOLOGY

The methodology for the both the needs snapshot and support snapshot is as follows:

- Desk research and (non-representative) interviews;
- Private sector stakeholder consultations
- In-country stakeholder consultations
- Selection of Case study countries may be based on e.g. availability of information, different market structures, different stages of market development and financial literacy

II. MSME LANDSCAPE ACROSS V20

In most vulnerable countries, micro, small and medium enterprises (MSMEs) are a source of employment and a significant contributor to GDP. In 2011, MSMEs employed up to 78% of the population and account for approximately 29% of GDP[1] in developing countries. In 2018, World Bank data showed that formal SMEs contribute up to 60% of total employment and up to 40% of national income in emerging economies[2]. Moreover, these statistics would like be higher if informal SMEs. The World Bank estimates that 600 million the global work force over the next 15 years, mainly from Asia and Sub-Saharan Africa, of which most of the new jobs are expected from MSMEs.

In short, MSMEs are also an engine for inclusive growth as they are also dispersed across rural areas. MSMEs also contribute to exports as well as to the country's tax base. As such, MSMEs can be considered as structurally relevant economic actors due to their ability to absorb a significant number Before beginning a discussion on MSME contributions at the country-level, it is important to note that countries have their own definitions of MSMEs. According to the SME Finance Forum, countries frequently use 10, 50 and 250 to define micro, small and medium enterprises, respectively. The employee-based definition is more uniform among microenterprises. Reason being, low- and middle- income economies tend to use comparatively lower threshold values for defining an MSMEs[3]. In addition to number of employees, commonly used variables for differentiating enterprises are turnover and value of assets.

The regional snapshots below will show that MSMEs contribute the largest share to stock of employment globally across varying income groups, and specifically in the low-income countries.

Asia-Pacific: On a country level, half of Afghanistan's GDP was contributed by the SME sector, which make up 80- 90% of Afghan businesses and employ 75% of labor force[4]. Bangladesh SMEs generate 75% of household income while contributing 25% to GDP and 75% to 80% of export earnings[5]. Bhutan's MSMEs make up approximately 98% of all formal-sector enterprises[6]. In Cambodia, SMEs

[1] https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-5631

[2] https://www.sciencedirect.com/science/article/pii/S2214845018300280

[3] https://www.smefinanceforum.org/sites/default/files/analysis%20note.pdf

[4] Afghanistan's SME Strategy (2009)

[5] Rahman

[6] Micro, Small and Medium Enterprise (MSME) Policy (2012-2020) of the Kingdom of Bhutan

employ 72% of the labor force and contribute 58% to GDP[7]. Mongolia's MSMEs generate 25% of the country's GDP and 52% of its employment[8]. Nepal's MSMEs contribute approximately 38% of the country's GDP and employ more than 2.5 million people[9]. In the Philippines, contributed almost 62.85% of the total jobs while accounting for 25% of the country's total exports revenue. In addition to direct impact to export revenue, MSMEs also contribute indirectly through subcontracting arrangement with large firms, or as suppliers to exporting companies[10]. MSMEs are thus considered larger contributors to employment growth compared to larger firms.

Africa: In the Democratic Republic of Congo, SMEs contribute up to 20% of GDP[11]. In the Gambia, MSMEs contribute about 20% of GDP and employ 60% of the urban labor force. MSMEs also constitute a crucial source of work for Gambian youth (18–35 year-olds), who own more than 40% of MSMEs[12]. According to a World Bank study, the youth are an important segment in certain SME sectors as they are more likely to display entrepreneurial skills. Moreover, while older firms contribute larger shares to stock of employment compared to younger firms, it is the young small firms that are larger contributors to net employment growth[13]. In Ghana, SMEs contribute to 70% of GDP[14]. Moreover, small businesses play key role in job creation, especially for female employment, contribution to tax revenue, and revenues[15]. This is corroborated by a World Bank study which found that SMEs have an important contribution in creating inclusive opportunities for women[16]. In Kenya, MSMEs employ more than 75% of the labor force[17]. MSMEs in Lebanon account for 60% of employment and 40% of the country's GDP[18]. In Morocco, the SME sector employs 50% of the work force and contributes to 51% of domestic investment and constitute the center of the economy with 40% of production and 31% of exports. Moreover, it contributes up to 20% of GDP[19]. MSMEs in Tunisia

[7] Switch Asia

[8] SME Law, 2007

[9] UNCDF

[10] https://www.dti.gov.ph/business/msmes/msme-resources/msme-statistics

[11] World Bank (2013)

[12] UNDP

[13] http://documents.worldbank.org/curated/en/577091496733563036/pdf/115696-REVISED-PUBLIC-SMEs-and-Jobs-final.pdf

[14] International Trade Centre

[15] https://www.researchgate.net/profile/Daniel_Agyapong/publication/49586572_Micro_Small_and_Medium_Enterprises'_Activities_Income_Level_and_Poverty_Reduction_in_Ghana_-_A_Synthesis_of_Related_Literature/links/02e7e5275ca0a86ebc000000/Micro-Small-and-Medium-Enterprises-Activities-Income-Level-and-Poverty-Reduction-in-Ghana-A-Synthesis-of-Related-Literature.pdf

[16] http://documents.worldbank.org/curated/en/577091496733563036/pdf/115696-REVISED-PUBLIC-SMEs-and-Jobs-final.pdf

[17] Micro and Small Enterprises Act (s. 2012)

[18] Ministry of Economy and Trade

[19] Mouhallab and Jianguo

account for about 40% of GDP and for 56% of employment[20]. The Yemeni economy is comprised primarily of micro and small enterprises, contributing to over 90% of all employment in the country[21].

Latin America and the Caribbean: In Costa Rica, MSMEs contributed to 46% of total employment and 30% of GDP[22]. Dominican Republic's MSMEs generate over 2.1 million jobs and account for 27% of GDP[23]. More than 70% of companies in the Caribbean are SMEs, which account for 70% of GDP and h of employment[24].

The table below distills the information above, showing the importance of MSMEs in V20 countries.

	Employment	**GDP Contribution**	**% of Business**	**Export Earnings**
Afghanistan	75%		80-90%	
Bangladesh	75%	25%; 40% of manufacturing output		75%-80%
Bhutan			98%	
Cambodia	72%	58%	99.7%	
Mongolia	52%	25%	98%	
Nepal	2.5 million people	38%		
Philippines	62.85%			25%
Samoa			88.27%	
DR Congo		20%	90%	
The Gambia	60%	20%		

[20] IFC report

[21] Adam Smith International

[22] data from the Ministry of Economy, Industry and Trade (Ministerio de Economía, Industria y Comercio, MEIC

[23] According to the FondoMicro 2013

[24] International Trade Centre

Ghana		70%	85%	
Kenya	More than 75%		More than 80%	
Lebanon	60%	40%		
Morocco	50%	20%	95%	31%
Rwanda	41%		98%	
Tunisia	56%	40%		
Yemen	90%		97%	
Costa Rica	46%	30%	95%	
Dominican Republic	2.1 million	27%	97%	
The Caribbean	50%	70%	70%	

Labor intensive sectors or industries are typically agriculture, forestry and aquaculture and construction, and thus make up a large proportion of MSMEs. For example, Ethiopia's economy is predominantly based on agriculture, with coffee as the major export crop. Almost 80% of Ethiopia's population is employed in the agricultural sector[25]. In the Gambia, Agriculture is an important contributor to the Gambia's GDP, accounting for 20%–25% of the country's real output over the past decade. Per size distribution, micro enterprises in the agricultural sector account to 11%, small is 57%, and medium at 21%[26]. However, in service economies like the Philippines with majority of GDP coming from services, the wholesale and retail industry make up 46.01% of MSMEs while accommodation and food service make up 13.22% and manufacturing at 12.61%. In Rwanda, a vast majority of MSMEs (93.07%) are in commerce and services.

[25] NBE 2016

[26] http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/brochure_ITC-Gambia%2010_web.pdf

THE NEED FOR LOW-CARBON TECHNOLOGY OPTIONS

Despite their contributions and structural importance, MSMEs face operational risk that could be caused by broader climate-related disasters that disrupt electricity access and/or due to imported fossil fuel powered generation plants, which translate to high electricity costs.

According to a 2016 World Bank Enterprise Surveys data report[27], 12% of business owners in developing economies perceive electricity (or lack thereof) as the biggest obstacle for their activities, behind only access to finance (16%). However, once connected to the grid, a business can face blackouts that forces it to halt production or resort to self-supply through generators, which comes at a significant cost. Lastly, electricity tariffs may hinder a firm where prices are high relative to income levels. This provides a business case for MSMEs to incorporate the use of low-carbon technology options to ensure reliability of supply and reduction in costs, all of which can lead to greater efficiency and productivity levels.

Despite the systematic deflationary nature of renewable energy prices globally and capital market support, most V20 countries have high prices of electricity. With technology costs coming down for rooftop solar and other energy efficiency, it increasingly becoming a viable and stable cost saving measure.

However, according to IEEFA[28], the large Philippine bank lenders limit their focus to 1- to 50-MW projects at the moment. This means that it is difficult to find financing for MSMEs that would typically use distributed rooftop solar systems. Nonetheless, current net-metering schemes combined with high electricity prices in the Philippines present a market for MSMEs. Demand is high already and is growing rapidly for rooftop-solar financing by way of loan and lease mechanisms that are currently not offered by local banks or other financiers.

According to MCII[29], in Barbados, MSMEs in agriculture and fisheries sectors have indicated some demand for incorporating renewable energy within their operations. However, there are specific challenges that need to be addressed if this emerging market were to be adequately insured. Major

[27] http://pubdocs.worldbank.org/en/444681490076354657/Electricity-Tariffs-Power-Outages-and-Firm-Performance.pdf

[28] http://ieefa.org/wp-content/uploads/2018/08/IEEFA_Unlocking-Rooftop-Solar-in-the-Philippines_August-2018.pdf

[29] https://reliefweb.int/sites/reliefweb.int/files/resources/Roadmap_ACRI_DINA4_Barbados_WEB_190513.pdf

challenges relate to the difficulties faced by MSMEs in purchasing insurance coverage as they are perceived as high risk and may have difficulty accessing finance.

Price of Electricity[30]

	Price of electricity (US cents per kWh) in 2019
Africa & Middle East	
Burkina Faso	22
Comoros	26.8
Democratic Republic of Congo	7.3
The Gambia	20
Ghana	22.2
Kenya	21.5
Lebanon	13.2
Madagascar	15.7
Malawi	11.5
Morocco	12.3
Niger	19.3
Rwanda	13.9
Senegal	17.3
Tanzania	12.3
Tunisia	9.7

[30] https://www.doingbusiness.org/en/custom-query

Asia-Pacific	
Afghanistan	17.6
Bangladesh	9.2
Bhutan	5.4
Cambodia	18
Fiji	20.3
Kiribati	39.4
Maldives	44.9
Marshall Islands	39.1
Nepal	11.4
Palau	31.1
Papua New Guinea	30.3
Philippines	16.4
Samoa	39.1
Sri Lanka	16.9
Timor-Leste	21.5
Vanuatu	43.6
Vietnam	12.3
Latin American & Caribbean	
Barbados	25.8

Colombia	13.2
Costa Rica	14.4
Dominican Republic	20.4
Grenada	27.6
Guatemala	19.4
Haiti	22.7
Honduras	17.2
St. Lucia	30.9

The V20 members, in aggregate, also represent a key group that can contribute to reductions in CO2 emissions to keep warming below 1.5 degrees Celsius. 26 V20 countries had CO2 emissions of 771.8 MT in 2016. This is equivalent to half of Russia's emissions, which is among the top 5 largest CO2 emitters. However, unlocking the low-carbon potential of V20 countries will require shifts within MSME value chains in addition to infrastructure, all of which require investment and enabling environments.

III. CLIMATE IMPACTS FOR MSMES AND THE WIDER ECONOMY

Yet, while MSMEs have the potential to play an important role in shifting towards climate-proof growth, they also are highly vulnerable to climate change, which puts V20 development objectives at risk. Several studies assessing the coping strategies of MSMEs in V20 economies often show significant vulnerabilities to climate impacts and low levels of response preparedness. MSMEs' vulnerability usually arises as a consequence of low human resources, insufficient financial and technical capacities to adapt to climate change, low levels of climate risk awareness and information access as well as only limited understanding of resilient response options. Moreover, even if well understood and potentially available, the necessary investments in response options might be too costly. Furthermore, in contrast to larger enterprises, MSMEs, especially micro enterprises, typically depend more on individual persons and are hence exposed to e.g. health or injury risk for the MSME owner and or his family.[31] They also typically operate in rather limited, local markets which are simultaneously affected by disaster.[32] Extreme weather events such as heavy rainfall, windstorms, flooding, or sudden droughts can, in effect, be interpreted to translate those vulnerabilities into damages on the four fronts of (1) Capital, (2) Logistic, (3) Labor and (4) Markets:[33] [34]

- **Capital**: Captures damages to land, equipment and revenue, potentially substantiating temporary cease of operations and requiring repair investments, thereby putting MSMEs under additional financial stress.
- **Logistic**: Disruption of public infrastructure, including roads and transportation, utility services such as water, electricity and communication, affecting business operations and supply chains
- **Labor**: Physical and/or psychological effects for employees, leading to a reduction in manpower and potential delays in business operations
- **Market**: Shift in demands or inflationary effects, potentially decreasing the revenue flows due to sales drops, thereby producing difficulties for MSMEs to manage their payable accounts

[31] https://microinsurancenetwork.org/sites/default/files/GIZ%20Inclusive%20Insurance%20Factsheet%20Series%20-%20Insurance%20for%20Micro%2C%20Small%20and%20Medium%20Enterprise%20Development.pdf

[32] Samantha (2017)

[33] ibid (Samantha (2017))

[34] https://dirp3.pids.gov.ph/webportal/CDN/PUBLICATIONS/pidsdps1520.pdf

Looking at MSMEs in V20 countries paints a diverse picture of MSME coping strategies with disaster:

Country	Natural hazard	Damages on 4 fronts	Coping strategy	Response barriers
Sri Lanka[35]	Torrential rain/Tropical storm, causing flood and landslides in 2016	**Capital:** Around 2/3 of MSMEs completely lost/damaged their equipment; Disrupted cash flow, loss income MSME and damage to buildings. **Market**: Loss of trading income	Reliance on relief agencies' distribution of capital goods (tools, equipment, machinery)	Lack of (financial) risk management mechanisms, low levels of customer and supply diversification
Philippines[36]	Typhoons Ketsana and Parma, causing flooding in 2009	**Capital**: Closure of firms and home-based enterprises due to damages to property and equipment; damaged raw material and inventory; Closure of restaurants and guest houses due to property damage; damaged high value crops **Labor**: 170 mio. workdays lost **Logistic**: Disruption in transport	Remittances for reconstruction with around 13% of micro-entrepreneurs being able to recover lost incomes; 11% refinancing via loans; Compensation through informal economic activity	Lack of disaster risk reduction, business risk assessments and business continuity planning; Small workforce, and limited market reach
Bangladesh[37]	29 floods and 40 storms (incl. cyclones) in 2000-2015	**Capital:** USD 5,6 bn in losses related to property, crops, and livestock	Farmers move to non-farm employment to tackle income reductions; Increased land	Frequent disasters reduce savings to invest in risk reduction measures and insurance

[35] Samantha (2017)

[36] https://dirp3.pids.gov.ph/webportal/CDN/PUBLICATIONS/pidsdps1520_rev.pdf

[37] https://www.adb.org/sites/default/files/publication/218876/ewp-505.pdf

		Labor: 8,600 deaths	rentals to increase operational farm size to intensify production	
Kenya[38] [39]	Extreme events in semi-arid regions	**Capital**: Reduced quality of agricultural land	Sale of assets; reduced employee numbers; loaning assets; accessing loans, diversification	Informality precluding access to finance and contract enforcement; lack of innovation capabilities and access to information
Kenya[40]	El Niño 2015-16, resulting in hydroelectric load shedding, water supply disruption and flooding	**Capital**: Increased cost of operation; Increase cost of acquiring new equipment, resulting in low annual profits **Labor**: Staff absences leading to decreased productivity levels **Logistic:** Disrupted supply chains **Market**: Price fluctuations due to supply chain disruptions	Suspension of business activities to manage risks, e.g. cleaning ditches, deploying flood defenses; reducing business hours; diversification; earlier order placements	Partial lack of material means, incentives, resources, knowledge and skills to effectively respond to (partially insufficient) information, lack of credit access
Ghana[41]	Flood, storm, rainfall, drought	**Capital**: Reduced farm revenue;	n/a	

[38] https://www.sciencedirect.com/science/article/abs/pii/S0959378006000689

[39] https://www.sciencedirect.com/science/article/pii/S0305750X18300974

[40] https://www.cambridge.org/core/services/aop-cambridge-core/content/view/4E87FAB6F1703FB2558CB2D0EE9845E2/S2059479818000145a.pdf/business_experience_of_floods_and_droughtrelated_water_and_electricity_supply_disruption_in_three_cities_in_subsaharan_africa_during_the_20152016_el_nino.pdf

[41] Asiedu, B., Malcolm, D., & Iddrisu, S. (2018). Assessing the economic impact of climate change in the small-scale aquaculture industry of Ghana, West Africa. AAS Open Research, 1

		Increased cost of maintenance; increased operating cost; total stock loss, reduced fish yield **Logistic**: Damage to pond and tanks		
Caribbean[42]	Various, including hurricane related rainfall and flooding	**Capital**: Reduction in revenue for tourism operators (e.g. hotel and beach facilities) **Logistic**: Damage to infrastructure (services)	Diversification of revenue sources; built-up of dykes, defenses and barriers along the cost	n/a
Colombia[43]	Sudden and slow onset events prior to 2008	**Capital**: Decreased coffee yields, resulting in decreased revenue for smallholder coffee producers **Labor**: Increased labor costs		Limited resources to address costly adaptation strategies

While most of these cases differ regarding their particular coping strategies, they do, however show that the MSMEs in the respective countries more often than not, lack the necessary adaptive capacity and thus struggle to independently and quickly respond and bounce back after natural shocks.[44] The measures taken to cope with climate impacts often have negative medium- and long-term effects: Across vulnerable countries, households and MSMEs resort to coping strategies, which decrease potential revenues and business viability in the long run. Such measures include the sale of productive assets, the depletion of savings, reduced spending on training and education or

[42] https://repositorio.cepal.org/bitstream/handle/11362/37056/S1420806_en.pdf

[43] Simpson, M., Gossling, S. and Scott, D. (2008): Report on the International Policy and Market Response to Global Warming and the Challenges and Opportunities that Climate Change Issues Present for the Caribbean Tourism Sector. Caribbean Regional Sustainable Tourism Development Programme (CRSTDP), Caribbean Tourism Organization, Barbados.

[44] Surminski?

taking out loans at prohibitively high interest rates[45]. For example, 47% of surveyed MSMEs in Sri Lanka identified disrupted cash flows and loss of income as the most devastating long-term impact of the tropical storm in 2016, because the resuming of business operations was severely hindered. The above cases furthermore also demonstrate that even investments in risk reduction might not be sufficient to protect against all disaster risk - the dykes in the Caribbean case were not enough to shield the country from substantial damage. In other cases, ex-post response mechanisms such as grants or in-kind contributions provided by relief agencies might only come with substantial time lag or not match the actual losses experienced enough to address them.[46] The reliance on mostly informal coping mechanisms and external support will not be sustainable over the long term, given that extreme weather events are expected to increase in frequency as well as intensity (magnitude). This will be especially relevant for more sophisticated and bigger MSMEs with higher assets that might be harder to recover.

Since the recovery period is drawn out as a result of such disaster management and response mechanisms, national growth might also be hampered: In the absence of accessible and/or affordable risk management options, such as individual and public investments in risk reduction, and financial instruments, like contingency loans or insurance, natural disasters often translate into negative macro-economic and fiscal impacts[47] [48]. As for the former, direct economic damages may result from the loss of lives, lost or devalued physical assets, and immediate output contractions.[49] Moreover, the consequences of these initial hits might be aggravated even further through indirect economic damages that can spring from the loss of potential (future) production due to lost production resources, disrupted supply chain flows and heightened production costs.[50]

The Philippines: Damage and losses for MSMEs

[45] http://www.climate-insurance.org/fileadmin/mcii/documents/MCII_2016_CRI_for_the_Poor_and_Vulnerable_full_study_lo-res.pdf

[46] http://documents.worldbank.org/curated/en/378521468174919954/pdf/WPS5269.pdf

[47] https://www.econstor.eu/bitstream/10419/64267/1/717874087.pdf

[48] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.558.9475&rep=rep1&type=pdf

[49] https://www.imf.org/en/Publications/WP/Issues/2017/11/08/The-Macro-Fiscal-Aftermath-of-Weather-Related-Disasters-Do-Loss-Dimensions-Matter-45296

[50] https://www.preventionweb.net/files/2544_ENVNatDisastLACeline.pdf

In 2009, the typhoons Ketsana and Parma caused severe damage and production losses across the MSME sector, amounting to PhP 114 bn and substantiating revenue losses of PhP 88,9 bn. In the wholesale and retail sector, over 40.000 MSMEs engaged in wholesale and retail trade, 50% of which were micro-enterprises, were flooded and lost most of their inventory buffer stock, worth PhP 77 bn. The associated revenue losses made up almost 80% of the foregone revenue. The typhoon also severely disrupted the operations of manufacturing enterprises, hindering the delivery of orders which were particularly high during the Christmas season. The foregone revenue added to the MSMEs' already reduced cash positions due to the need to replace damaged raw materials and inventory stocks. In terms of employment, a total of 170 million work day were lost. Translated in foregone wages, employees in the commercial sector, 60% of which were self-employed, took the biggest hit, losing PhP 32.6 bn of income, which amounts to 65% of the total wage income lost. Considering the significant share of self-employed workers, such income losses may not only lead to negative consumption effects, but also increase the risk of poverty incidence.

Sri Lanka: Damage and Losses for MSMEs[51]

Following the tsunami of 2004, a set of 424 enterprises ranging in size from 5 to 50 workers was surveyed regarding the related impacts. Within this set, the larger firm owners reported USD 40.000 losses in business assets and approximately USD 6.000 in household assets. Micro-enterprises indicated lost business assets worth USD 897, while household losses ranging at around USD 4000. Employees (excluding self-employed ones) reported household losses around USD 5000.

Morocco: Damage and Losses for MSMEs[52] [53] [54]

In Morocco, the industrial zone Ait Melloul produces 90% of the country's export. The zone is in the Souss-Massa region, which is highly vulnerable to climate change, especially intensifying droughts and flood risk. Agribusinesses located in this area experience increasing production costs due to water scarcity and energy price spikes. Between 1995 and 2005,

[51] http://documents.worldbank.org/curated/en/378521468174919954/pdf/WPS5269.pdf

[52] http://www.climate-insurance.org/fileadmin/mcii/ACRIplus/Factsheets/Factsheet_Morocco_ACRI__Advancing_Climate_Risk_Insurance_for_SME_Parks_in_Morocco_May17_.pdf

[53] https://indexinsuranceforum.org/sites/default/files/Roadmap_ACRI_DINA4_Marokko_french_WEB_190606_0.pdf

[54] https://pdfs.semanticscholar.org/f146/b48e2a5d9354f7a1d2652b5a05c6865db900.pdf

flood-related damages amounted to USD 295 mio in damages in that region, while the World Bank estimates that annual losses for the Moroccan commercial and industrial sector as a whole amount to USD 434,000 and 471,000 respectively.

Yet, since large segments of the economy and households are often unable to effectively respond to disasters, including through utilizing insurance, governments often bear the brunt of the repair and recovery costs. At the same time, however, public revenue might decrease due to lower levels of tax income stemming from income taxes paid by e.g. MSMEs, VAT applied to consumption, and import duties: Since economic activity may be disrupted and hence slow down, MSME output and revenue, consumption and the demand for foreign inputs may decrease. Governments, in turn, are often forced to respond to these budgetary pressures by "running down foreign-exchange reserves, increasing levels of domestic and/or external borrowing, or increasing the money supply". Heightened domestic borrowing might, in turn, drive up domestic interest rates, potentially substantiating a credit squeeze and thereby worsening the already limited accessibility of loans needed for recovery. Foreign borrowing, in contrast, could lead to an appreciation of the exchange rate, which might make foreign inputs more affordable for MSMEs, while increasing the value of exported goods. Yet, most importantly, through natural disasters the risk premiums charged on a country's assets may rise and thereby result in higher debt servicing costs for governments.[55] [56]

Sectoral Damages and Fiscal Impacts in St. Lucia[57]

In 2013, the December flood event in St Lucia resulted in damages of USD 9.21 mio for the agricultural sector, substantiating income losses of USD 2.11 mio., USD 400,000 damages for industry and commerce, and USD 2.11 mio losses in income for the tourism sector. While the agricultural sector only contributed 3.9% of the country's GDP in 2013, its' overall employment share of 11% meant that the damages and income losses affected more than one tenth of St. Lucia's population directly. The biggest losses in the agricultural sector

[55] https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/6149.pdf

[56] https://www.eenews.net/assets/2016/11/30/document_cw_01.pdf

[57] https://www.gfdrr.org/sites/default/files/publication/pda-2014-saint-lucia.pdf

pertained to lost crops, but damages to farm infrastructure, including both fixed and non-fixed assets were also hindering possibilities to quickly resume operations. The tourism sector sustained its losses mostly not due to damages to physical assets, but to foregone business due to the break-down of infrastructure services, especially transportation. Businesses in the industry and commerce sector, many of them MSMEs, lost inventory, physical infrastructure and business opportunities and 13 of them reported being affected mostly by water supply interruptions and limited transportation means.

In terms of fiscal impacts, revenue impacts were actually expected to be minimal, but the expected increase in the cost of agricultural produce (due to now limited supply) was anticipated to increase as was the inflation rate. This, in turn was projected to lead to a depreciation of the national currency and to thereby increase the importation of agricultural products, translating into effects on the country's balance of payments.

While the significance of disaster-related fiscal impacts, especially tax revenue, is not fully agreed upon, the overall negative impact on countries' economies and growth prospects is clear. Furthermore, it is also understood that governments often lack the financial capacity to fully compensate for disaster-related downturns. What is also clear, however, is that the efficacy of the private sector response to natural shocks plays an important role in determining the shock's fiscal impacts.[58] Yet, more often than not, households and businesses' perceived need of financial protection instruments, such as, for example, insurance is relatively low, since public post-disaster assistance may be expected. In combination with several other factors, e.g. low per capita incomes, the resulting low insurance uptake within vulnerable countries may therefore not only hinder the speedy recovery of key MSME sectors but also divert public resources away from other investments.

More specifically, low non-life insurance penetration rates indicate an underinsured private sector. This in turn, adds to the indirect contingent liabilities of the government and hence the costs it might be expected to incur: Implicit contingent liabilities represent "moral obligations or burdens that, although not legally binding, are likely to be borne by governments, because of public

[58] https://www.imf.org/en/Publications/WP/Issues/2017/11/08/The-Macro-Fiscal-Aftermath-of-Weather-Related-Disasters-Do-Loss-Dimensions-Matter-45296

expectations or political pressure”[59]. To decrease such ‘hidden’ costs of disaster as well as to increase speed of recovery and strengthen national economic activity, governments should consider the built-up of cost-effective insurance markets, aligned with the promotion of risk reduction investments.[60] [61]

[59] https://reliefweb.int/sites/reliefweb.int/files/resources/125553-WP-DRFTA-Report-StLucia-Final2018-LowRes-PUBLIC.pdf

[60] https://reliefweb.int/sites/reliefweb.int/files/resources/125553-WP-DRFTA-Report-StLucia-Final2018-LowRes-PUBLIC.pdf

[61] https://www.g20fukuoka2019.mof.go.jp/en/meetings/pdf/S3-1_Olivier%20Mahul.pdf

IV. USING CLIMATE-SMART INSURANCE TO INCREASE MSME RESILIENCE

WHICH INSURANCE COULD HELP: CLIMATE RISK INSURANCE FOR CLIMATE-RELATED RISKS[62]

Within the current landscape of insurance instruments, there are broadly two options to enhance the menu of insurance options available for MSMEs to protect their operations against climate risk:

- Make coverage against climate risk part of already existing bundled/composite products covering multiple risks[63];
- Apply climate risk lens to existing insurance approaches to develop new insurance products, specifically designed to protect against climate risks

MULTI-RISK (PROPERTY) INSURANCE:

Businesses can protect their operations against a variety of risks relevant in the context of climate change, including insurance products against fire and property damage, windstorm and other natural perils and business interruption. **Multi-risk property insurance** typically covers a range of risk (multi-risk) and works to protect valuable assets, e.g. building, machinery, stock, equipment, and tools in the event of accidental physical loss or damages related to fire, water damage, theft, robbery etc. Similar to multi-risk property insurance, fire insurance, as a standalone policy, insures premises and assets against the risk of fire. Taking out fire insurance would be particularly relevant for businesses facing high risks in that area, since they might not be sufficiently covered as part of a composite/bundled insurance product such as the aforementioned multi-risk property insurance.

[62] Merry, Surminski, GIZ, PrAdA, CARD, ClimateWise

[63] Even if bundled products might only provide limited cover for certain included risk types, they can be seen to be attractive particularly to small business owners, which prefer limited coverage for a range of risks they can see as potentially materializing (cf. Merry). This also holds under observations made in developed country contexts, where the highest insurance uptake for MSMEs can be seen for bundled product offerings.

SINGLE/MULTI-PERIL INSURANCE:

Typically, multi-risk property insurance also does not include protection against natural hazards, such as flood, windstorm, heavy rain, earthquake or drought. Similar to fire insurance, protection against these risks could **either become part of a composite/bundled multi-risk property insurance** product or be **offered as standalone policy**, e.g. either as **multi-** or **single-peril (natural peril) insurance**, which would protect premises, assets and/or crops explicitly against pre-defined weather risk/s. If needed, such insurance policies might also be adapted to include protection against earthquake risk/s. In case of damaged equipment and lost tools due to a typhoon for example, a manufacturing enterprise receiving its insurance payout may be able to quickly replace the lost goods needed to keep the business running. Similarly, a retail shop owner whose roof has been damaged by heavy rain might be able to use the insurance payout to quickly repair the damage to prevent further damage and/or reduce business interruption time.

In the context of climate impacts,

- **Multi-risk property insurance**, which **include coverage specifically for relevant (climate-related) weather risks** can be considered an option for MSMEs, especially those with lower income, and those that need to cover a wide range of risk/s; This could include businesses for which climate impacts translate into asset repricing or revaluation.
- **Single/Multi-peril property insurance** can be considered an option especially for those MSMEs with lower income and a significant need to cover climate risks, or for MSMEs with higher income, a significant need to cover climate risk/s, but resourceful enough to take out multi-risk property insurance and single/multi-peril insurance. This could include businesses for which climate impacts translate into asset repricing or revaluation.

Moreover, it is important to note that property insurance products tend to differentiate between **fixed assets (physical structures, e.g. buildings, etc.) and non-fixed assets (e.g. inventory**). Depending on businesses types, ensuring coverage for the adequate asset class is therefore important.

BUSINESS INTERRUPTION INSURANCE:

Business interruption insurance safeguards income losses resulting from the disruption of business activities. In this case, the risk protected against is not related to the loss of physical assets but to the potential loss of assets due to business disruption. For example, while properties (fixed asset) are being repaired or inventory is re-stocked (non-fixed asset) and business operations can only be continued on a limited basis or not at all. Usually, business interruption insurance covers the revenue a business would have earned (based on the business' previous financials). Due to flooding, a restaurant, for example, might need to cease operations temporarily and hence forgo business. The insurance would then be triggered and provide coverage for the duration of closure. The respective payout could then be used to pay wages and/or invest in repairs. Yet, typically, business interruption insurance does not cover weather-related risks and would thus have to be adapted to match the needs of the respective MSME. This could either happen in the form of a **bundled/composite business interruption insurance**, which **covers climate-related/weather risks alongside other risks**, or in the form of a **standalone, climate/weather-related business interruption insurance** policy.

CREDIT-LINKED INSURANCE

Credit-linked insurance can protect both the lender and the borrower against a risk of default. In this case, the insurance contract could be designed to protect the lender (typically a bank) against climate-related income losses of its client. The policy would be taken out by the financial institution and ideally work to improve the risk-profile of the borrower. Though it is usually the case that credit-linked insurance increases the cost of borrowing, it can allow for credit access for more risky clients. In some cases, it may reduce the overall cost of the riskier client by not requiring collateral.

In the context of climate impacts,

- **Business interruption insurance** can be considered an option especially for those MSMEs which are at high risk of interrupted operations due to property damage and/or disrupted supply chains, despite potentially having taken-out multi-risk property insurance or single/multi-peril property insurance. This can include businesses with outstanding loans and/or are highly affected by climate impacts

which translate to disrupted logistics and/or affected markets, as well as those businesses whose operations are highly labor-intensive.

- **Credit-linked insurance** can be considered an option especially for MSMEs considered high risk borrowers. Property insurance or business income interruption insurance products can be considered as an alternative if these can be expected to sufficiently protect against climate-related revenue losses to cover both damages and loan repayment.

Business continuity and disaster preparedness plans:

Yet, to identify the feasibility of the aforementioned products and the need for them, MSMEs must understand the risks faced as well as the response options possible in case they materialize. Most importantly therefore, businesses should have business continuity and disaster preparedness plans in place before they consider selecting an adequate insurance instrument. More importantly, business continuity plans (BCP) and disaster preparedness plans help a business to (1) understand its vulnerabilities and the respective business impacts should these go unmitigated, and (2) identify essential business activities, equipment, supplies, and personnel to maintain operations, (3) develop a plan of how these issues could be addressed as well as (4) understand the requirements to do so. Doing so may not only elicit key assets and/or functions at high risk, but also elicit any immediate financial needs to maintain these key assets and or functions in case of disaster-related damages. This, in turn, is essential to inform the selection of an adequate insurance instrument - If deemed feasible and cost-effective. In many cases, investing in risk reduction may be more beneficial than investing in an insurance policy right away.

DISTINGUISHING BETWEEN MICRO ENTERPRISES AND SMALL AND MEDIUM ENTERPRISES

It should, however, be noted that in order to enhance the provision of adequate coverage, it can be essential to distinguish between micro enterprises (MEs) and small and medium enterprises (SMEs). MEs usually strongly depend on the owner and its family and often make no distinction between household and business finances, and assets. In these cases, the adequate, climate-related insurance coverage may be a multi-risk coverage protecting household assets such as vehicles and

properties. Since the primary risk focus of MEs would however, most likely be on key persons, that is the owner, MEs might have a preference for personal rather than asset-based coverage. In these cases, one may be willing to consider combining accident, health, and asset-related insurance into one bundled product.

While the owner is key, SMEs usually operate more sophisticated with clearly divided systems and financial planning procedures, hold substantial business assets and have a number of formal employees. For SME clients, multi-risk and bundled asset-based coverage, group policies for employees and business interruption coverage may be considered.

Personalized insurance products for micro-entrepreneurs:

Bundled personal insurance: Combined with further coverage, e.g. funeral, injury, fire and specific perils, insurance products which cover both, personal as well as asset-related risks might be a means to target especially micro-entrepreneurs.

WHICH INSURANCE COULD HELP:

INSURANCE PRODUCTS TO ENHANCE LOW CARBON INVESTMENT

Rapid cost deflation of renewable energy means that there is a potential for productivity gains through reduced electricity costs. Moreover, energy efficiency measures can also lead to cost savings. However, investments made for efficiency savings is typically undervalued, especially for MSMEs that may not have adequate savings and access to financing. An insurance product can help build a value proposition for MSMEs to invest in efficiency savings. For example, an insurance product that covers projected energy savings for a specifically defined and verifiable energy efficiency measures as agreed upon in a standard contract between the MSME and technology services providers can improve the viability of the investment and thus can better gain access to finance. This insurance product can compensate the MSME in the event the promised financial flows associated with energy efficiency savings are not realized. Both the MSME and the financier can thus have a level of predictability in the cash flows and surety that the energy efficiency projects will generate enough

energy savings to pay for the loans assumed. There are also knock-on effects as lower energy costs can lead to increased productivity and thus improved profitability.

CLIMATE-SMART INSURANCE APPROACHES IN V20 REGIONS

Asia-Pacific: Insurance for Sari-Sari shops in the Philippines

The Sagip Negosyo insurance policy offered by CARD Pioneer in the Philippines was developed and implemented in context of the "Project Bagong Araw: Re-building through Microinsurance and Women's Enterprises in the Philippines" (PREMIUM) to support the owners of Sari-Sari stores ("neighborhood/sundry stores") in the aftermath of Typhoon Hayan in 2013.[64] [65] More specifically, the main objective of the project was to capacitate growth-oriented micro-entrepreneurs supporting the creation of resilient regional supply chains in the Leyte and Samar provinces. Sari-sari stores are usually family-owned and -run convenience shops located at every street and account for roughly 70% of all sales of manufactured goods across the Philippines. They thus take on a substantial role in supplying the population with basic goods: Approximately 94% of the population shop in these stores per month and thus form the largest retail channel in the country, with an estimated value of USD 10 billion per year. After Typhoon Haiyan, many stores and/or inventory of goods were almost completely destroyed and access to capital was very limited; for rebuilding, many stores almost exclusively relied on donations, borrowed money from family members, as well as savings and the little inventory of stocks that remained after disaster. Therefore, the insurance policy Sagip Negosyo was designed as part of PREMIUM to increase the future resilience of the Sari-Sari stores. It is a bundled product, which covers risks related to personal accident, funeral, fire assistance, typhoon flood and earthquake (for fixed assets). Annual payments are priced at USD 40/family or USD 37/individual and the maximum coverage is USD 3000/accident, USD 300/funeral, USD 600/fire, USD100/typhoon flood and USD 20/earthquake[66]. The policy developed by CARD Pioneer Microinsurance, Inc. (CPMI), CARD MRI Insurance Agency, Inc. (CaMIA), CARD Inc., Microventures Foundation (MVF)/Hapinoy, and MiMAP (RIMANSI) and was progressively modified throughout the project. From 2016 ("un-modified policy before addition of climate-related insurance element), the number of policyholders rose from 170,328 people to

[64] http://cdfcanada.coop/media/2018/05/PHILIPPINES-PREMIUM-Brochure-min.pdf

[65]

[66] https://www.recoveryplatform.org/assets/publication/Publication2019/CISL%20Mutual%20microinsurance.pdf

357,034 people in 2018. Following Typhoon Urduja in 2017, 15 Sagip Negosyo stores in the Leyte and Samar provinces received a total of PhP 30,750 each due to store damages, which supported reconstruction efforts.[67] Moreover, the insurance policy was not introduced in a vacuum. In addition to expanding accessible financial product offerings as one of its key pillars, PREMUM focused on training the entrepreneurs with regard to business management skills, including the preparation of BCPs and DPPs and separating private consumption and business inventories, and the diversification of revenue streams by selling life and non-life insurance products to affected communities through their Sari-Sari stores.[68] [69]These components were implemented together with a phletora of local actors, such as RIMANSI. When concluding in early 2019, PREMIUM had reached a total of direct 1,600 beneficiaries, with storeowners reporting greater resilience and improved growth prospects.[70] [71] [72]

Africa and the Middle East: Adaptation of Agricultural Value Chains to Climate Change (PrAda) in Madagascar

In Madagascar, the project "Adaptation of Agricultural Value Chains to Climate Change" (PrAda) commenced in 2017 and currently works to increase productivity across agricultural supply chains affected by climate change via (1) improving access to agro-meterological services, (2) improving production and management techniques along the value chain and (3) introducing climate risk insurance schemes for key value chain actors. The project focuses on several value chains, including cash crops such as vanilla, non-cash crops such as peanut as well as the fishery sector in the three Southern regions Anosy, Androy and Atsimo Atsinanana and seeks to work through a partnership of national and international insurers, including ARO as a local insurer. Across these selected value

[67] https://rimansi.org/2019/07/3205/

[68] http://rimansi.org/2018/09/palarong-sari-sari-sure-kicked-off-in-samar/

[69] http://rimansi.org/2019/07/162-sari-sari-store-owners-join-the-palarong-sari-sari-sure-during-the-second-microinsurance-roadshow/

[70] https://cdfcanada.coop/our-projects/premium/

[71] https://www.hapinoy.com/new-blog/2018/3/16/back-to-business-rising-from-the-ruins-of-typhoon-yolanda

[72] https://www.philstar.com/other-sections/the-good-news/2019/02/25/1896404/dream-on-one-womans-post-yolanda-journey

chains, the key value chain actors targeted through the project include primary producers, refining industries as well as wholesale retailers.[73]

Latin America and the Caribbean: Colombia's Energy Savings Insurance (ESI) Program for Enterprises[74]

Colombia's Energy Savings Insurance (ESI) Program facilitates an insurance product that covers the damages incurred from not obtaining the estimated energy savings. This is important because the estimated savings provide the investment case for investment in energy efficiency and renewable energy investments. The ESI Program is thus able to reduce investment risk which can incentivize MSMEs to invest in more efficient technologies and thus improve their productivity through cost-savings while reducing emissions.

There are five projects in Colombia covering both the retail and service sectors that have invested in energy efficiency and renewable energy as a result of the ESI Program. One example is the Neiva Plaza Hotel which has replaced obsolete boilers with solar thermal heaters. Inefficiencies can lead to additional costs for MSMEs. Despite a clear case to invest in new technology, MSMEs may not have the savings or access to affordable credit to enable an investment. This illustrates a clear demand for a de-risking product to encourage this investment for both the MSME and the financier (typically, a bank). The ESI Program facilitated an insurance product though SURA, one of the main insurers in Latin America, for technology service providers. The reason why it makes sense for the technology service provider to buy the insurance is that it guarantees their service of energy savings, making their solution bankable. The insurance product covers projected energy savings for a specifically defined and verifiable energy efficiency measures as agreed upon in a standard contract between the MSME and technology services providers. In this case Más Centígrados SAS supplier for the solar thermal heaters will buy the insurance policy. Its risk-sharing mechanisms compensate firms like Neiva Plaza Hotel in the event that promised financial flows associated with energy efficiency savings are not realized. The insurance product offers both Neiva Plaza Hotel and the bank a level of predictability in the cash flows and surety that the energy efficiency projects will generate enough energy savings to pay for the loans assumed. In this case, the insurance product de-risked the investment and enabled Neiva Plaza Hotel to obtain a loan of 122 million Colombian pesos (around 40,000 USD) from Banco Davivienda of Colombia. There are also knock-on effects for

[73] Interview

[74] https://www.iadb.org/en/news/colombia-issues-first-energy-savings-insurance-policies

Neiva Plaza Hotel as lower energy costs can lead to increased productivity and thus improved profitability.

Cost savings and maximizing revenue are key drivers for investment in energy efficiency and renewable energy. Under a similar investment case, Villa Martha Hotel installed 10kWp of solar photovoltaic (PV) with an investment value of 94 million pesos (30,000 USD). A retailer, Supertiendas Arrieras, also insured by SURA, invested its own resources to install 10kWp of solar PV, a solar farm generating 9,723 MWh annually and third solar system connected to the grid with 11,292 kWh of monthly generation.

Climate-smart insurance for MSMEs to increase resilience and productivity: A model perspective

The following section offers a hypothetical overview of how climate-smart insurance could help strengthen the financial resilience and productivity of MSMEs. Model 1 concentrates on climate-risk insurance and is focused on the case of Sari-Sari stores in the Philippines. Model 2 demonstrates the impact of an insurance product on guaranteed cost savings to encourage a low carbon investment decision of the Sari-Sari store.

Financial Statements Explained:

Income Statement: This captures revenues, expenses, and profits/losses. This can be considered the most important of the financial statements, since it presents the operating results/performance of an enterprise.

Balance Sheet: This captures the assets, liabilities, and equity of the enterprise. This can be considered the second most important financial statement, since it provides information about the liquidity and capitalization of an enterprise. It is important to take note of the shareholders' equity because it represents the enterprise's net worth. A steady growth in shareholders' equity means the accumulation of investment returns for current equity shareholders.

Statement of Cash Flows: This captures cash inflows and outflows and thus the enterprises' cash position. This shows whether the enterprise has enough cash to pay for expenses and asset purchases.

MODEL 1: INSURANCE INSTRUMENTS TO ENHANCE LOW CARBON INVESTMENT

Model 2 concentrates on insurance to encourage a low carbon investment for cost savings and also focuses on the case of Sari-Sari stores in the Philippines. It briefly demonstrates how an insurance product on guaranteed cost savings enables the store to invest in a solar rooftop system, which was previously too high risk.

Low-Carbon Technology for a Sari-Sari in the Philippines

For a Sari-Sari store, we assume a 1.25kWp solar rooftop system can be used to reduce electricity prices by more than 50%. The savings can be realized with by reducing use during peak, continued use during off-peak and net metering (exports to the grid for excess electricity generated). We assume a cost of PHP50,000 for 1.25kWp to install the system by month 6.

However, to warrant this investment, the Sari-Sari store is not in a financial position to take out a loan of PHP50,000 without guaranteed savings, which it could use to pay back the loan. In this case, the store would decide to not move forward with the investment. Moreover, even if the Sari-Sari store decided to accept the risk and invest in solar panels, the likelihood to receive a loan from the bank may be relatively low.

An insurance product which protects against the risk of smaller than projected energy savings materializing, could be introduced. Doing so allows the technology provider to ensure the cost savings through solar panels, which in turn, gives the Sari-Sari store sufficient predictability of cash flows that can be used to pay for financing. Note that the technology provider includes the cost of the insurance product in the overall price to the Sari-sari store. Moreover, due to the insurance

product, it is more likely for a bank to lend to the store, because the savings can be interpreted as the cash flow used to repay the loan. In the scenario presented below, the loan's interest rate is 6% per annum. The effects include a 3% reduction in SG&A costs due to a reduction in electricity prices. A reduction in costs means improved profitability. In this case, there is a positive effect on net income by almost 10% from PHP15,120 to PHP16,625. Moreover, shareholder's equity, compared to the base case is improved by 16% from PHP177,950 to PHP206,450 by month 12.

Table x: Renewables Effect on Income Statement

INCOME STATEMENT													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Sales		180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Less COGS		(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)
Gross profit		45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Less SG&A expenses		(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(18,000)	(18,000)	(18,000)	(18,000)	(18,000)	(18,000)	(18,000)
Less depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Earnings before interest and taxes		21,600	21,600	21,600	21,600	21,600	27,000	27,000	27,000	27,000	27,000	27,000	27,000
Less interest expense		-	-	-	-	(3,250)	(3,250)	(3,250)	(3,250)	(3,250)	(3,250)	(3,250)	(3,250)
Pre-tax income		21,600	21,600	21,600	21,600	18,350	23,750	23,750	23,750	23,750	23,750	23,750	23,750
Cumulative pre-tax income (NOL)		21,600	43,200	64,800	86,400	104,750	128,500	152,250	176,000	199,750	223,500	247,250	271,000
Taxes		6,480	6,480	6,480	6,480	5,505	7,125	7,125	7,125	7,125	7,125	7,125	7,125
Pre-tax income		21,600	21,600	21,600	21,600	18,350	23,750	23,750	23,750	23,750	23,750	23,750	23,750
Less taxes		(6,480)	(6,480)	(6,480)	(6,480)	(5,505)	(7,125)	(7,125)	(7,125)	(7,125)	(7,125)	(7,125)	(7,125)
Net income		15,120	15,120	15,120	15,120	12,845	16,625	16,625	16,625	16,625	16,625	16,625	16,625

Table x: Renewables Effect on Balance Sheet

BALANCE SHEET													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Cash	-	8,370	23,490	38,610	43,730	46,575	53,200	59,825	66,450	73,075	79,700	86,325	92,950
Inventory	6,750	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	6,750	21,870	36,990	52,110	57,230	60,075	66,700	73,325	79,950	86,575	93,200	99,825	106,450
Gross property, plant & equipment	100,000	100,000	100,000	100,000	100,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Less accumulated depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-
Net property, plant & equipment	100,000	100,000	100,000	100,000	100,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Total assets	106,750	121,870	136,990	152,110	157,230	210,075	216,700	223,325	229,950	236,575	243,200	249,825	256,450
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Notes payable	-	-	-	-	-	50,000	-	-	-	-	-	-	-
Total current liabilities	-	-	-	-	-	50,000	-	-	-	-	-	-	-
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Shareholders equity	106,750	121,870	136,990	152,110	157,230	160,075	166,700	173,325	179,950	186,575	193,200	199,825	206,450
Total liabilities and shareholders equity	106,750	121,870	136,990	152,110	157,230	160,075	166,700	173,325	179,950	186,575	193,200	199,825	206,450

Table x: Renewables Effect on Statement of Cash Flows

STATEMENTS OF CASH FLOWS													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Net income		15,120	15,120	15,120	15,120	12,845	16,625	16,625	16,625	16,625	16,625	16,625	16,625
Plus depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Less increase in inventory	(6,750)	(6,750)	-	-	-	-	-	-	-	-	-	-	-
Less increase in accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus increase in accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations	(6,750)	8,370	15,120	15,120	15,120	12,845	16,625	16,625	16,625	16,625	16,625	16,625	16,625
Less investment	(100,000)	-	-	-	-	(50,000)	-	-	-	-	-	-	-
Cash flow from operations and invests	(106,750)	8,370	15,120	15,120	15,120	(37,155)	16,625	16,625	16,625	16,625	16,625	16,625	16,625
Plus net new equity capital raised	106,750	-	-	-	-	-	-	-	-	-	-	-	-
Less dividends paid	-	-	-	-	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)
Plus net new long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus net new borrowings	-	-	-	-	-	50,000	-	-	-	-	-	-	-
Cash flow from ops, invests, and fin	-	8,370	15,120	15,120	5,120	2,845	6,625	6,625	6,625	6,625	6,625	6,625	6,625
Beginning cash balance	-	-	8,370	23,490	38,610	43,730	46,575	53,200	59,825	66,450	73,075	79,700	86,325
Ending cash balance	-	8,370	23,490	38,610	43,730	46,575	53,200	59,825	66,450	73,075	79,700	86,325	92,950

MODEL 2: CLIMATE RISK INSURANCE FOR MSMEs

The following hypothetical case showcasing the use and benefit of climate risk insurance proceeds as follows:

1. **The base case is introduced by showing the store's financial position**

- Income statement, Balance sheet, and Statement of cash flows before typhoon Ompong strikes (External Shock 1).

2. **External shocks 1 & 2 - Scenario 1: The store responds by taking out a loan**

- External shock 1 (Typhoon): The shop responds by taking out a loan **after** Ompong struck
    - Typhoon impacts (financial loss) and effects of loan reflected in income statement, balance sheet, and statement of cash flows
- External shock 2 (Inflation): The shop suffers under increased inflation due to supply disruptions, a knock-on effect of Ompong that materializes only later
    - Inflation impact (financial loss) in combination with loan taken out after external shock 1 reflected in income statement, balance sheet, and statement of cash flows

3. **External shocks 1 & 2: Scenario 2**: **The store responds through using climate risk insurance**

- External shock 1 (Typhoon): The shop responds through its climate risk insurance policy taken out **before** Ompong struck
    - Typhoon impacts (financial loss) and effects of insurance reflected income statement, balance sheet, and statement of cash flows
- External shock 2 (Inflation): The shop suffers under increased inflation due to supply disruptions, a knock-on effect of Ompong that materializes only later
    - Inflation impact (financial loss) in combination with insurance taken out before external shock 1 reflected in income statement, balance sheet, and statement of cash flows

1. The base case: Key financial positions of Sari-Sari shop

There are 1.1 million Sari-Sari stores ("neighborhood/sundry stores")) in the country. However, despite their collective size and importance, these enterprises often do not have the financial strength or tools available to them to recover from external shocks.

Table x: Base Assumptions

Own Capital Invested	PHP106,750 for 32 square meter shop and initial inventory (replenished once a week).
Sales	Revenue of PHP6,000 per week with 75% for cost of goods sold and 15% for labor, business permit renewal and utilities, leading to a pre-tax income of PHP21,600 per month (10% of revenue).
Tax	30% (of pre-tax income)
Financial Services/ Products Available	Loan of up to PHP200,000 at an interest rate of 3% per month (not taken out yet).

Table x: Base Case Income Statement

INCOME STATEMENT													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Sales		180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Less COGS		(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)
Gross profit		45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Less SG&A expenses		(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)
Less depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Earnings before interest and taxes		21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600
Less interest expense		-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax income		21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600
Cumulative pre-tax income (NOL)		21,600	43,200	64,800	86,400	108,000	129,600	151,200	172,800	194,400	216,000	237,600	259,200
Taxes		6,480	6,480	6,480	6,480	6,480	6,480	6,480	6,480	6,480	6,480	6,480	6,480
Pre-tax income		21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600	21,600
Less taxes		(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)
Net income		15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120

Table x: Base Case Balance Sheet

BALANCE SHEET													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Cash	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	64,210	69,330	74,450	79,570	84,690
Inventory	6,750	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	6,750	21,870	36,990	52,110	57,230	62,350	67,470	72,590	77,710	82,830	87,950	93,070	98,190
Gross property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Less accumulated depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-
Net property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Total assets	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	177,710	182,830	187,950	193,070	198,190
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Notes payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Shareholders equity	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	177,710	182,830	187,950	193,070	198,190
Total liabilities and shareholders equity	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	177,710	182,830	187,950	193,070	198,190

Table x: Base Case Statement of Cash Flows

STATEMENT OF CASH FLOWS													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Net income		15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120
Plus depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Less increase in inventory	(6,750)	(6,750)	-	-	-	-	-	-	-	-	-	-	-
Less increase in accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus increase in accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations	(6,750)	8,370	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120
Less investment	(100,000)	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations and invests	(106,750)	8,370	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120	15,120
Plus net new equity capital raised	106,750	-	-	-	-	-	-	-	-	-	-	-	-
Less dividends paid	-	-	-	-	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)
Plus net new long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus net new borrowings	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from ops, invests, and fin	-	8,370	15,120	15,120	5,120	5,120	5,120	5,120	5,120	5,120	5,120	5,120	5,120
Beginning cash balance	-	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	64,210	69,330	74,450	79,570
Ending cash balance	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	64,210	69,330	74,450	79,570	84,690

2. External shocks 1 & 2 - Scenario 1: The store responds by taking out a loan

External shock 1: Typhoon

In month 8, Typhoon Ompong strikes and translates into impacts on the three fronts - assets, labor and logistics by physical damage to the store, workplace injury and disrupted road networks. In order to repair the damage, the store owner decides to borrow PHP200,000 at an interest rate of 3% per month.

Table x: Effects of External Shock 1 on Income Statement in Month 8

INCOME STATEMENT													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Sales		180,000	180,000	180,000	180,000	180,000	180,000	180,000	-	180,000	180,000	180,000	180,000
Less COGS		(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)
Gross profit		45,000	45,000	45,000	45,000	45,000	45,000	45,000	(135,000)	45,000	45,000	45,000	45,000
Less SG&A expenses		(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)
Less depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Earnings before interest and taxes		21,600	21,600	21,600	21,600	21,600	21,600	21,600	(158,400)	21,600	21,600	21,600	21,600
Less interest expense		-	-	-	-	-	-	-	-	(6,000)	(6,000)	(6,000)	(6,000)
Pre-tax income		21,600	21,600	21,600	21,600	21,600	21,600	21,600	(158,400)	15,600	15,600	15,600	15,600
Cumulative pre-tax income (NOL)		21,600	43,200	64,800	86,400	108,000	129,600	151,200	(7,200)	8,400	24,000	39,600	55,200
Taxes		6,480	6,480	6,480	6,480	6,480	6,480	6,480	(45,360)	2,520	4,680	4,680	4,680
Pre-tax income		21,600	21,600	21,600	21,600	21,600	21,600	21,600	(158,400)	15,600	15,600	15,600	15,600
Less taxes		(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	-	(2,520)	(4,680)	(4,680)	(4,680)
Net income		15,120	15,120	15,120	15,120	15,120	15,120	15,120	(158,400)	13,080	10,920	10,920	10,920

Table x: Effects of External Shock 1 on Balance Sheet in Month 8

BALANCE SHEET													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Cash	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	690	3,770	4,690	5,610	6,530
Inventory	6,750	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	6,750	21,870	36,990	52,110	57,230	62,350	67,470	72,590	14,190	17,270	18,190	19,110	20,030
Gross property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	200,000	200,000	200,000	200,000	200,000
Less accumulated depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-
Net property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	200,000	200,000	200,000	200,000	200,000
Total assets	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	214,190	217,270	218,190	219,110	220,030
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Notes payable	-	-	-	-	-	-	-	-	200,000	200,000	200,000	200,000	200,000
Total current liabilities	-	-	-	-	-	-	-	-	200,000	200,000	200,000	200,000	200,000
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Shareholders equity	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	14,190	17,270	18,190	19,110	20,030
Total liabilities and shareholders equity	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	214,190	217,270	218,190	219,110	220,030

Table x: Effects of External Shock 1 on Statement of Cash Flows in Month 8

STATEMENT OF CASH FLOWS													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Net income		15,120	15,120	15,120	15,120	15,120	15,120	15,120	(158,400)	13,080	10,920	10,920	10,920
Plus depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Less increase in inventory	(6,750)	(6,750)	-	-	-	-	-	-	-	-	-	-	-
Less increase in accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus increase in accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations	(6,750)	8,370	15,120	15,120	15,120	15,120	15,120	15,120	(158,400)	13,080	10,920	10,920	10,920
Less investment	(100,000)	-	-	-	-	-	-	-	(100,000)	-	-	-	-
Cash flow from operations and invests	(106,750)	8,370	15,120	15,120	15,120	15,120	15,120	15,120	(258,400)	13,080	10,920	10,920	10,920
Plus net new equity capital raised	106,750	-	-	-	-	-	-	-	-	-	-	-	-
Less dividends paid	-	-	-	-	(10,000)	(10,000)	(10,000)	(10,000)	-	(10,000)	(10,000)	(10,000)	(10,000)
Plus net new long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus net new borrowings	-	-	-	-	-	-	-	-	200,000	-	-	-	-
Cash flow from ops, invests, and fin	-	8,370	15,120	15,120	5,120	5,120	5,120	5,120	(58,400)	3,080	920	920	920
Beginning cash balance	-	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	690	3,770	4,690	5,610
Ending cash balance	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	690	3,770	4,690	5,610	6,530

What this shows is that due to the impact of the Typhoon in Month 8, the shop has negative net income of PHP158,400 (which translates to an ending cash balance of PHP690 in the statement of cash flows), which are due to the loss of stocked goods worth 135,000 (as stated on the income statement under COGS - Cost of Goods Sold) combined with the costs of continued operational expenses, (as stated on the income statement under SG&A -Selling, General and Administrative expenses) while no sales. To respond to these impacts, the store takes out a loan worth PHP200,000 in month 8 (as shown on the balance sheet).

External shock 2: Inflation

In month 12, inflation, or the general increase in commodity prices, rose by 6.7% due to supply disruptions caused by the onslaught of Typhoon Ompong. This can be interpreted as Ompong translating into impacts in the fourth front - markets. It also means that net income is now less owing to increases in COGS from 75% to 81.7% and increases in the cost of utilities, increasing SG&A

expenses from 13% to 16%, leading to a pre-tax income of negative PHP1,860 in month 12. Note that the shop owner cannot charge higher prices due to competition. Assuming that the Sari-sari store did not go with the initial bundled climate-smart insurance product and instead opted for the PHP200,000 loan, it can be more exposed to inflationary effects. Gross profit is 26.8% less due to due to price increases in commodities, affecting items sold in small stores, while expenses including electricity increase. Other effects include a reduction in the purchasing power of both workers and the store owner.

Table x: Effects of External Shock 2 on Income Statement in Month 12

INCOME STATEMENT													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Sales		180,000	180,000	180,000	180,000	180,000	180,000	180,000	-	180,000	180,000	180,000	180,000
Less COGS		(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(147,060)
Gross profit		45,000	45,000	45,000	45,000	45,000	45,000	45,000	(135,000)	45,000	45,000	45,000	32,940
Less SG&A expenses		(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(23,400)	(28,800)
Less depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Earnings before interest and taxes		21,600	21,600	21,600	21,600	21,600	21,600	21,600	(158,400)	21,600	21,600	21,600	4,140
Less interest expense		-	-	-	-	-	-	-	-	(6,000)	(6,000)	(6,000)	(6,000)
Pre-tax income		21,600	21,600	21,600	21,600	21,600	21,600	21,600	(158,400)	15,600	15,600	15,600	(1,860)
Cumulative pre-tax income (NOL)		21,600	43,200	64,800	86,400	108,000	129,600	151,200	(7,200)	8,400	24,000	39,600	37,740
Taxes		6,480	6,480	6,480	6,480	6,480	6,480	6,480	(45,360)	2,520	4,680	4,680	-
									100,000				
Pre-tax income		21,600	21,600	21,600	21,600	21,600	21,600	21,600	(158,400)	15,600	15,600	15,600	(1,860)
Less taxes		(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	(6,480)	45,360	(2,520)	(4,680)	(4,680)	-
Net income		15,120	15,120	15,120	15,120	15,120	15,120	15,120	(113,040)	13,080	10,920	10,920	(1,860)

Table x: Effects of External Shock 2 on Balance Sheet in Month 12

BALANCE SHEET													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Cash	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	46,050	49,130	50,050	50,367	38,507
Inventory	6,750	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	14,103	14,103
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	6,750	21,870	36,990	52,110	57,230	62,350	67,470	72,590	59,550	62,630	63,550	64,470	52,610
Gross property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	200,000	200,000	200,000	200,000	200,000
Less accumulated depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-
Net property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	200,000	200,000	200,000	200,000	200,000
Total assets	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	259,550	262,630	263,550	264,470	252,610
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Notes payable	-	-	-	-	-	-	-	-	200,000	200,000	200,000	200,000	200,000
Total current liabilities	-	-	-	-	-	-	-	-	200,000	200,000	200,000	200,000	200,000
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Shareholders equity	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	59,550	62,630	63,550	64,470	52,610
Total liabilities and shareholders equity	106,750	121,870	136,990	152,110	157,230	162,350	167,470	172,590	259,550	262,630	263,550	264,470	252,610

Table x: Effects of External Shock 2 on Statement of Cash Flows in Month 12

STATEMENT OF CASH FLOWS													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Net income		15,120	15,120	15,120	15,120	15,120	15,120	15,120	(113,040)	13,080	10,920	10,920	(1,860)
Plus depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Less increase in inventory	(6,750)	(6,750)	-	-	-	-	-	-	-	-	-	(603)	-
Less increase in accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus increase in accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations	(6,750)	8,370	15,120	15,120	15,120	15,120	15,120	15,120	(113,040)	13,080	10,920	10,317	(1,860)
Less investment	(100,000)	-	-	-	-	-	-	-	(100,000)	-	-	-	-
Cash flow from operations and invests	(106,750)	8,370	15,120	15,120	15,120	15,120	15,120	15,120	(213,040)	13,080	10,920	10,317	(1,860)
Plus net new equity capital raised	106,750	-	-	-	-	-	-	-	-	-	-	-	-
Less dividends paid	-	-	-	-	(10,000)	(10,000)	(10,000)	(10,000)	-	(10,000)	(10,000)	(10,000)	(10,000)
Plus net new long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus net new borrowings	-	-	-	-	-	-	-	-	200,000	-	-	-	-
Cash flow from ops, invests, and fin	-	8,370	15,120	15,120	5,120	5,120	5,120	5,120	(13,040)	3,080	920	317	(11,860)
Beginning cash balance	-	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	46,050	49,130	50,050	50,367
Ending cash balance	-	8,370	23,490	38,610	43,730	48,850	53,970	59,090	46,050	49,130	50,050	50,367	38,507

Due to inflation, the costs of goods needed in stock rise from PHP135,000 in month 11 to PHP147,060 in month 12 as seen in the income statement. This, in turn, decreases the store's net income from PHP10,920 in month 11 to negative PHP1,860 in month 12, which, in turn reduces the store's ending cash balance by 23.5% from PHP50,367 (which could be interpreted as the store's savings throughout the year) to PHP38,507 in month 12 as shown in the statement of cash flows. The reduction in available cash/potential savings therefore also reduces the store's overall shareholder equity by 18.4% from PHP64,470 in month 11 to PHP52,610 in month 12.

3. External shocks 1 & 2 - Scenario 2: The store responds through using climate risk insurance

Instead of borrowing PHP200,000 from an external funding source at 3% interest rate per month to fix the shop, the Sari-sari store owner could buy a bundled product to enable predictability in its ability to recover. Overall, losses for the small retail store including property damage, loss of income, loss of inventory and ongoing expenses is equivalent to PHP280,000. The losses exclude compensation to the worker for injury while in the workplace. In this case, the Sari-sari store owner bought bundled protection at a cost of PHP3,600 per month. The bundled product includes coverage for climate-related business interruption, multi-peril property damage (covering typhoon and earthquake perils for both fixed and non-fixed assets) and work injury insurance. The maximum coverage is PHP180,000/business interruption, PHP100,000/property and PHP25,000/work injury. It should be noted that any excess cash can be kept as savings or invested to reduce risk exposure for any knock-on effects.

External shock 1: Typhoon

Table x: Climate-Smart Tool Reduces Effects of Effects of External Shock 1 on Income Statement in Month 8

INCOME STATEMENT													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Sales		180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Less COGS		(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)
Gross profit		45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Less SG&A expenses		(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)
Less depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Earnings before interest and taxes		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Less interest expense		-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax income		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Cumulative pre-tax income (NOL)		18,000	36,000	54,000	72,000	90,000	108,000	126,000	144,000	162,000	180,000	198,000	216,000
Taxes		5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400
Pre-tax income		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Less taxes		(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)
Net income		12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600

Table x: Climate-Smart Tool Reduces Effects of External Shock 1 on Balance Sheet in Month 8

BALANCE SHEET													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Cash	-	5,850	18,450	31,050	33,650	36,250	38,850	41,450	154,050	56,650	59,250	61,850	64,450
Inventory	6,750	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	6,750	19,350	31,950	44,550	47,150	49,750	52,350	54,950	167,550	70,150	72,750	75,350	77,950
Gross property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	(100,000)	100,000	100,000	100,000	100,000
Less accumulated depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-
Net property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	(100,000)	100,000	100,000	100,000	100,000
Total assets	106,750	119,350	131,950	144,550	147,150	149,750	152,350	154,950	67,550	170,150	172,750	175,350	177,950
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Notes payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Shareholders equity	106,750	119,350	131,950	144,550	147,150	149,750	152,350	154,950	167,550	170,150	172,750	175,350	177,950
Total liabilities and shareholders equity	106,750	119,350	131,950	144,550	147,150	149,750	152,350	154,950	167,550	170,150	172,750	175,350	177,950

Table x: Climate-Smart Tool Reduces Effects of Effects of External Shock 1 on Statement of Cash Flows in Month 8

STATEMENT OF CASH FLOWS													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Net income		12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600
Plus depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Less increase in inventory	(6,750)	(6,750)	-	-	-	-	-	-	-	-	-	-	-
Less increase in accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus increase in accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations	(6,750)	5,850	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600
Less investment	(100,000)	-	-	-	-	-	-	-	100,000	(100,000)	-	-	-
Cash flow from operations and invests	(106,750)	5,850	12,600	12,600	12,600	12,600	12,600	12,600	112,600	(87,400)	12,600	12,600	12,600
Plus net new equity capital raised	106,750	-	-	-	-	-	-	-	-	-	-	-	-
Less dividends paid	-	-	-	-	(10,000)	(10,000)	(10,000)	(10,000)	-	(10,000)	(10,000)	(10,000)	(10,000)
Plus net new long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus net new borrowings	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from ops, invests, and fin	-	5,850	12,600	12,600	2,600	2,600	2,600	2,600	112,600	(97,400)	2,600	2,600	2,600
Beginning cash balance	-	-	5,850	18,450	31,050	33,650	36,250	38,850	41,450	154,050	56,650	59,250	61,850
Ending cash balance	-	5,850	18,450	31,050	33,650	36,250	38,850	41,450	154,050	56,650	59,250	61,850	64,450

The monthly payment of the insurance premium is reflected as an increase of SG&A on the income statement from 13% to 15%, rising from PHP23,400 in the base case to PHP27,000. This, in turn, reduces the initial net income from PHP15,120 in the base case to PHP12,600. Due to the insurance payout due to business interruption, the net income as stated on the statement of cash flows remains constant. In addition, the damages to property of PHP100,000 is seen on balance sheet can be repaired by investing the PHP100,000 payout received due to the property insurance coverage (as seen in the cash flow statement).

External shock 2: Inflation

In month 12, inflation, or the general increase in commodity prices, rose by 6.7% due to supply disruptions caused by the onslaught of Typhoon Ompong. This means that net income is less owing to increases in cost of goods sold from 75% to 81.7% and increases in labor, business permit renewal and utilities from 13% to 16%, leading to a pre-tax income of PHP4,140 per month. Note that the

shop owner cannot charge higher prices due to competition. Assuming that the small retail did not go with the initial bundled climate-smart insurance product and instead opted for the PHP200,000 loan, it will be more exposed to inflationary effects. Net income is less than 80% due to price increases in commodities, affecting items sold in small stores and expenses including electricity. Other external effects include a reduction in the purchasing power of both workers and the store owner.

Table x: Climate-Smart Tool and Planning Reduces Effects of Effects of External Shock 2 on Income Statement in Month 12

INCOME STATEMENT													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Sales		180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000
Less COGS		(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(135,000)	(147,060)
Gross profit		45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	32,940
Less SG&A expenses		(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(27,000)	(28,800)
Less depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Earnings before interest and taxes		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	4,140
Less interest expense		-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax income		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	4,140
Cumulative pre-tax income (NOL)		18,000	36,000	54,000	72,000	90,000	108,000	126,000	144,000	162,000	180,000	198,000	202,140
Taxes		5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	1,242
Pre-tax income		18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	4,140
Less taxes		(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(5,400)	(1,242)
Net income		12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	2,898

Table x: Climate-Smart Tool and Planning Reduces Effects of External Shock 2 on Balance Sheet in Month 12

BALANCE SHEET													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Cash	-	5,850	18,450	31,050	33,650	36,250	38,850	41,450	154,050	56,650	59,250	61,247	54,145
Inventory	6,750	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	13,500	14,103	14,103
Accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current assets	6,750	19,350	31,950	44,550	47,150	49,750	52,350	54,950	167,550	70,150	72,750	75,350	68,248
Gross property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	(100,000	100,000	100,000	100,000	100,000
Less accumulated depreciation	-	-	-	-	-	-	-	-	-	-	-	-	-
Net property, plant & equipment	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	(100,000	100,000	100,000	100,000	100,000
Total assets	106,750	119,350	131,950	144,550	147,150	149,750	152,350	154,950	67,550	170,150	172,750	175,350	168,248
Accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Notes payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Total current liabilities	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Shareholders equity	106,750	119,350	131,950	144,550	147,150	149,750	152,350	154,950	167,550	170,150	172,750	175,350	168,248
Total liabilities and shareholders equity	106,750	119,350	131,950	144,550	147,150	149,750	152,350	154,950	167,550	170,150	172,750	175,350	168,248

Table x: Climate-Smart Tool and Planning Reduces Effects of Effects of External Shock 2 on Statement of Cash Flows in Month 12

STATEMENT OF CASH FLOWS													
Month	0	1	2	3	4	5	6	7	8	9	10	11	12
Net income		12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	2,898
Plus depreciation		-	-	-	-	-	-	-	-	-	-	-	-
Less increase in inventory	(6,750)	(6,750)	-	-	-	-	-	-	-	-	-	(603)	-
Less increase in accounts receivable	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus increase in accounts payable	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from operations	(6,750)	5,850	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	12,600	11,997	2,898
Less investment	(100,000)	-	-	-	-	-	-	-	100,000	(100,000)	-	-	-
Cash flow from operations and invests	(106,750)	5,850	12,600	12,600	12,600	12,600	12,600	12,600	112,600	(87,400)	12,600	11,997	2,898
Plus net new equity capital raised	106,750	-	-	-	-	-	-	-	-	-	-	-	-
Less dividends paid	-	-	-	-	(10,000)	(10,000)	(10,000)	(10,000)	-	(10,000)	(10,000)	(10,000)	(10,000)
Plus net new long-term debt	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus net new borrowings	-	-	-	-	-	-	-	-	-	-	-	-	-
Cash flow from ops, invests, and fin	-	5,850	12,600	12,600	2,600	2,600	2,600	2,600	112,600	(97,400)	2,600	1,997	(7,102)
Beginning cash balance	-	-	5,850	18,450	31,050	33,650	36,250	38,850	41,450	154,050	56,650	59,250	61,247
Ending cash balance	-	5,850	18,450	31,050	33,650	36,250	38,850	41,450	154,050	56,650	59,250	61,247	54,145

Due to inflation, the costs of goods needed in stock rise from PHP135,000 in month 11 to PHP147,060 in month 12 as seen in the income statement. This, in turn, decreases the store's net income from PHP12,600 in month 11 to PHP2,898 in month 12, which in turn reduces the store's ending cash balance by 23% from PHP61,247 to PHP54,145 (which could be interpreted as the store's savings throughout the year), as shown in the statement of cash flows. This shock only reduces shareholder equity by 4% from PHP175,350 in month 11 to PHP168,248 in month 12.

INTERPRETATION OF RESULTS

Comparing these two, undoubtedly highly stylized cases, demonstrates the short- as well as medium-term benefit of insurance (proactive measure) as compared to credit (reactive measure):

After Ompong hit (external shock 1), the option to respond to via credit leads to a net income of PHP10,920 (and hence the store's cash-on-hand for that month that could be added to savings) and shareholder equity (the overall value owned by the storeowner) worth PHP20,030 in month 12, while responding via insurance leads to a net income of PHP12,600 and shareholder equity worth PHP177,950.

After inflation increases as a consequence and in addition to the direct impacts of Ompong (external shock 2), having responded via credit prior to increased inflation, leaves the store with a net income of PHP1,860 and shareholder equity worth PHP52,610 in month 12, while having responded via insurance prior to increased inflation leaves the store with a net income of PHP2,898 and shareholder equity worth PHP168,248 in month 12.

Overall, this case highlights that credit is best used for investment instead of a reactive measure after an external shock. While this case highlights the use of insurance as a

proactive measure, it is important to realize that proactive measures can lead to greater value and can take shape in the form of insurance or investment to reduce exposure. Ascertaining the most cost-effective proactive measure is key to improve cost savings and maximize revenue potential.

INSURANCE AS SUB-COMPONENT OF COMPREHENSIVE RISK MANAGEMENT

When discussing insurance as a means to enhance resilience, two points have to be noted: First, while important, insurance is only a sub-component within the type of overarching and comprehensive risk management strategies needed to build resilience against natural catastrophes. Second, the cost-effectiveness of insurance strongly depends on other complementary risk reduction and risk retention measures. Sustainable, climate-smart insurance should therefore be introduced within the context of broader, integrated risk management solutions.

Applying a risk layering approach can help to identify the most cost-effective combination of risk management opinions. Within the framework of specific resilience targets, the approach differentiates and addresses different risk layers according to their frequency and return period. Most basically, the approach shows which risks to reduce first, before looking into arranging risk retention and risk transfer mechanisms. This allows to understand how much to optimally spend on risk reduction, risk retention and transfer: Since risk reduction investments reduce the potential damage caused by future events, the cost of risk retention and risk transfer events fall. Risk layering helps to understand exactly how much resources should be spent on risk reduction investments if other options such as insurance and risk retention are available too; and how much these would cost, in turn.[75] [76]

For MSMEs, such framework needs to be applied to decide on the feasibility of structural and non-structural risk reduction measures. Structural risk reduction measures could include investing in

[75] https://www.indexinsuranceforum.org/sites/default/files/Publikationen03_DRF_ACRI_DINA4_WEB_190617.pdf

[76] http://www.climate-insurance.org/fileadmin/mcii/pdf/ACRI_/ACRIplus_2018_Summary_ToolBox.pdf

flood protection such as dykes, building upgrades, technology upgrades or emergency water and electricity sources. Non-structural measures allude to softer risk reduction strategies such as diversification of inputs and/or suppliers or business model changes. While risk reduction measures are important to enhance the effectiveness, feasibility and sustainability of insurance products, it may also encourage more entrepreneurship and prudent risk taking. It's benefits therefore extend beyond those for insurance.[77]

Those residual risks which can't be avoided or addressed cost-effectively through risk reduction measures, should be addressed through financial protection instruments. Scholarship most commonly differentiates between risk retention instruments and risk transfer instruments. In case of the former, the risk and the associated costs are retained by those affected by the risk. In case of the latter, risk ins transferred onto a third party. In the context of MSMEs, the most important retention instruments are savings and contingent credit lines, while insurance is the most relevant risk transfer instrument. To ensure the cost-effective use of insurance, MSMEs should analyze the most cost-effective options for given risks. In some cases, insurance may not even be needed: For one, the MSME's savings may be sufficient to cover potential damages associated with lower cost risks. Alternatively, the MSME may find that the cumulative premium payments for the kind of coverage needed for its lower cost risk are more expensive than using contingent credit lines. In other cases, it may either be insurance or a combination of savings and/or contingent credit and insurance that provide the most cost-effective financial protection.[78] [79] Depending on the cases at hand, the individual complementarities between risk reduction, retention and transfer measures may be different. Yet, regardless of these differences across cases, capitalizing on these complementarities in the context of developing sustainable climate-smart insurance solutions will be key.

[77] GFPI Paper

[78] https://www.indexinsuranceforum.org/sites/default/files/Publikationen03_DRF_ACRI_DINA4_WEB_190617.pdf

[79] https://www.inclusiveinsuranceasia.com/docs/Toolkit_Publication_Final.pdf

V. POLICY FRAMEWORKS AND REGULATION ACROSS V20

The previous chapters supported the need for climate-smart insurance products from a demand side perspective: MSMEs' often substantial influence over socio-economic development and the potential role climate-smart insurance products could play in protecting them, support the preliminary conclusion that enhancing the development, introduction and expansion of such product offerings across V20 countries can produce meaningful resilience benefits.

Other relevant factors to be considered in support of the SIF objectives pertain to the supply side factors affecting the provision of climate-smart insurance products, most importantly, current policy frameworks, regulations and in-country product offerings. Gaps and Barriers related to these supply side factors may hinder the development of climate-smart insurance for MSMEs and therefore further support the V20-request for a systematic and coordinated approach to enhance efforts in this area.

NATIONAL STRATEGIES

Many V20 members are dominated by banks. This means that having insurance in these markets requires a planned financial sector strategy, which is lacking in implementation. Moreover, it is key to look at capital markets and insurance at the same time. Having an insurance market means also needing avenues to invest. If the funds go back to the banking sector as investment, this can be considered very risk. As such, from a financial stability perspective, it makes sense to develop both insurance and capital markets.

Despite the lack of insurance regulation and its implementation deficits of planned financial sector strategies due to capacity constraints, protecting and enhancing productivity of MSMEs and their associated value chains are prominent in disaster risk financing strategies, adaptation strategies, insurance strategies and financial inclusion strategies of V20 members.

Below is an overview of some of these strategies from V20 countries. It is clear that MSMEs are a priority and considered structurally important to employment rates and GDP. However, many lack

a clear framework or menu of tools to enable climate-smart protection and productivity for MSMEs. Climate-smart insurance is prioritized in well-established insurance markets such as the Philippines. However, most lack an operationalization of MSME protection to enable climate-smart insurance uptake.

Country		**Strategy (e.g. disaster risk financing strategy, Adaptation strategy, Insurance strategy, financial inclusion strategy)**
Asia-Pacific		
Afghanistan	Afghanistan National Development Strategy (ANDS): An Interim Strategy for Security, Governance, Economic Growth, and Poverty Reduction (January 2006)	An effective program of "value chain" investments to stimulate rural economic activities (e.g. horticulture and livestock) that lead to competitive exports and import substitutes will be promoted within the private sector. Such a program will start with protecting the assets of the poor, especially land ownership, and lead all the way through the value chain to final exports/internationally competitive import substitution, and would include marketing, quality standards, power for cold stores, transport infrastructure, and policy liberalization.
	Afghanistan National Development Strategy (2008-2013)	Disaster preparedness and community-based insurance schemes is considered as one of the high priority sector policies for poverty reduction. The Government will initiate the establishment of community based crop insurance schemes to enable the poor to better mitigate the risks of losing harvest. The initial focus of the strategy will include serving key economic sectors, addressing key challenges of access to formal finance to the individuals and MSMEs protecting the rights of consumers of the financial services as well as leveraging technology to expand the outreach to formal financial services across the country. To better serve the financial needs of MSMEs, Afghanistan needs to confront the weaknesses in the legal and regulatory framework of secured lending. Afghanistan needs to create a strong framework and infrastructure for contract enforcement and secured transactions. Development of Appropriate (Innovative) Operating Models and Strengthening of Value Chains to link private agribusinesses and small farmers. This would be achieved via: Business development services providers. The Afghan government's support to formalize value chains through reinforced linkages between value chain actors, as well as increased linkages between formal financial institutions and mature

		farmers/enterprise groups would support the expansion of agriculture finance, through more innovative operating models.
	Baseline: No adequate market or framework to supply provision of climate-smart insurance. Though, MSMEs are a high priority in agriculture and rural development towards financial inclusion and overall development goals.	
Bangladesh	National Industrial Policy 2016	Micro, Small and Medium Enterprises (MSMEs) are the largest segment of an economy. They accounts for 25 percent of Bangladesh GDP and employed 87% of civilian population. Bangladesh provided significant importance to MSMEs in National Industrial Policy 2016, SME Policy Strategies 2005 and upcoming drafts of both the policies. Bangladesh Small and Cottage Industries Corporation (BSCIC) was established in 1957, Small and Medium Enterprise Foundation (SME Foundation) was established in 2007 and a significant number of development projects were implemented to facilitate establishment and promotion of MSMEs in Bangladesh.
	Baseline Though MSMEs are a priority, a lack of a unified framework affects the effectiveness of MSME policies. There is also no engagement in climate-smart insurance provision for MSMEs.	
Bhutan	National Financial Inclusion Strategy 2018-2023	Significant disparities in financial inclusion persist between rural and urban areas, youth and adults, the poor and the rich, and cottage and small industries (CSIs) and large firms. The potential to leverage digital technologies and expand the reach of the formal financial sector has not yet been fully realized in Bhutan. Low financial literacy, few consumer protection mechanisms and a lack of appropriate financial products and services are also barriers to financial inclusion.
	Baseline: SMEs and climate-smart insurance are of considerable importance but lack the framework and comprehensive entry point.	
Fiji	National Financial Inclusion Strategic Plan (2016-2020)	Services and Products which include, among others, piloting programs between private and public sectors that link up products and channels for delivery of financial services and products including insurance, retirement savings for the informal sector and credit for MSMEs; provision of support for the development of green financial services and products. This includes services and products designed for individuals, households and MSMEs that reduce negative environmental impacts or provide environmental benefits.
	Baseline: MSME importance highlighted with government supported allocated, now need scalable and sustainable solutions.	
Marshall Islands	Joint National Action Plan for Climate Change Adaptation & Disaster Risk Management 2014-2018	Strengthen existing R&D program to promote alternative income generating activities (e.g. commercial pandanus fruit products for the local market and for export), including a resilient tourism sector and

		developing capacity in small businesses by extending Small Business Development Program to Outer Islands
	Baseline: MSME importance is highlighted with a focus on productivity with a need for protection tools.	
Philippines	Philippine Development Plan 2017-2022	To improve access to production networks • Support linkages between MSMEs and large corporations to facilitate increased participation of the former in global value chains. • Develop more inclusive business models and social enterprises. • Establish feasible domestic economic zones for MSMEs. To improve the stakeholders' access to finance • Streamline and simplify loan processes for MSMEs, cooperatives, and OFs. • Provide financial literacy training for MSMEs, cooperatives, and OFs and their families. • Assess MSME-related laws. To improve the stakeholders' productivity, efficiency, and resilience • Increase access to technology. • Implement MSME Development Plan and assess MSME-related laws. • Encourage entrepreneurship, especially in households of OFs."
	"Disaster Risk Financing and Insurance Strategy"	The most vulnerable people and businesses at the micro, small, and medium-sized enterprise level to quickly restore their livelihoods after a disaster.
	National Climate Change Adaptation Plan 2011-2028	Develop and implement risk transfer mechanisms for MSMEs and CC vulnerable communities and livelihood to strengthen the capacity to cope with extreme weather events and impacts of climate change
	Baseline: The Philippines has an established insurance industry and MSME is of significant importance. However, it lacks operationalization of MSME protection to enable climate-smart insurance uptake.	
Tuvalu	National Strategy for Sustainable Development 2016-2020	Growing the private sector – mainly micro, small and medium enterprises (MSME) – faces many constraints. The main constraints are Tuvalu's small isolated market, small economy, small scattered population, underdeveloped infrastructure, lack of low-cost bulk air cargo services, high costs, and dependence on a large, inefficient public sector that

		swallows up capital and crowds out more diversified capital investments. Notable challenges that small private sector operators and producers must face on a daily basis include poor credit access, commercial credit available only at high (non-market-based) interest rates, high utility costs (telecommunications, internet, power), and limited, costly and often unreliable cargo shipping (air and sea). Other equally important problems include a chronic shortage of managerial, technical and marketing skills, few home grown retail products, and no local product export industry. Seventy seven (77) percent of MSMEs in Vanuatu used informal savings for business start-up, followed by 10 percent borrowed from commercial banks, 8% use other sources not specify in the survey, while 2 percent used informal credit and loan from other financial institutions respectively. Sixteen (16) percent of MSME applied for loans from commercial banks during the past twelve months. Forty two (42) percent did not apply for other reasons and 42 percent were excluded. Similarly, only 2 percent of MSMEs applied for loans from other financial institutions, 32 percent did not apply for other reasons and 66 percent were excluded.
	Baseline: Highlights importance of MSMEs but lacks the scale to sustain finance or insurance solutions.	
Vanuatu	Vanuatu National Financial Inclusion Strategy 2018 – 2023	Strategic Goal 3: Micro, Small and Medium Enterprise Financing - Introduce policies and a regulatory environment to support access to finance for MSMEs, with a - Coordinate and harmonize Government's work through a variety of line Ministries to mainstream financial inclusion products and programmes targeted at MSME, rural entrepreneurs and womenowned institutions. - Ensure there is effective collaboration between Government and the private sector in regard to improving access and usage of financial services for MSMEs. - Promote the development of an accessible suite of quality, affordable and easily accessible financial services, including insurance for MSMEs and value chains in the agriculture, fisheries and tourism sectors. - Simplify loan application processes for small rural entrepreneurs.

		- Encourage widely available financial literacy programmes targeted at building entrepreneurial and financial management skills, including women entrepreneurs. - Promote consumer protection and empowerment in MSME Finance.
	Baseline: MSME value-chain protection is important but requires menu of tools.	
Vietnam	Socio-Economic Development Plan 2016-2020	Continue to restructure the financial market to ensure rational structure between currency market, capital market and the insurance market. Pay attention to rapidly develop capital market and insurance market, develop a healthy stock market associated with restructuring activities of the currency market in alignment with the new stage.
	Baseline: MSMEs and the development of climate-smart insurance markets is important to Vietnam. The next step is to operationalize these objectives.	
Caribbean and Latin America		
Colombia	Estrategia Nacional de Inclusión Financiera en Colombia 2016	The Government will promote the dissemination of factoring as a mechanism alternative financing for the SME sector as well as for the massification of instrument of security interests in order to effectively extend the receipt of guarantees and the granting of credits to both small and medium enterprises. These initiatives seek to strengthen the information systems that support the activities credit, especially those aimed at the non-formal population or without access to the system financial.
	Baseline: MSMEs prioritized through provision of financing and guarantees. Insurance can likely facilitate MSME	
Honduras	Estrategia Nacional de Inclusión Financiera (ENIF) 2015-2020/ National Financial Inclusion Strategy 2015-2020	The plan extends benefits to Micro, Small and Medium Enterprises (MSMEs) and to the different sectors productive of the country. The ENIF will be implemented over the next five years with the objective of supporting the informal economy, micros and small merchants, entrepreneurs, farmers, beneficiaries of government bonds, employees and remittance recipients. It also has as components: Government commitments, regulations, distribution of financial products and services, financing and technical assistance.
	Baseline: MSMEs are a priority and the government can likely include provision of insurance within menu of products and services.	
Africa		
The Gambia	NATIONAL DISASTER MANAGEMENT PROGRAMME: STRATEGIC ACTION PLAN 2008 - 2011	Private sector priority target group of national disaster management strategic framework for action: Private actors to acquire knowledge, skills and right attitude for the attainment of an effective disaster and risk reduction system in the country

	Baseline is: No adequate framework to supply the provision of climate-smart insurance, even though the importance of MSMEs seems somewhat recognized.	
Madagascar	National Financial Inclusion Strategy of Madagasca 2018-2022	The government intends to improved MSME's access to financing, especially those operating in the agricultural sector and in the other product value chains/sectors, will be emphasized in the next five years.
	Baseline: Appears to be a focus on MSME lending. Climate-smart insurance can likely play a role to enhance credit capacity.	
Morocco	Kingdom Of Morocco Financial Inclusion And Digital Economy DPF	Access to finance for entrepreneurs and micro, small, and medium enterprises (MSMEs) is still a challenge. The Government of Morocco (GOM) five-year Program (2017–2021) emphasizes upgrading large export industries and supporting start-up companies and MSMEs through a package of financial and non-financial resources.
	Baseline: MSMEs are prioritized for export growth. Climate-smart insurance can play a role in protection value chains but requires a clear framework.	
Rwanda	"7 Years Government Programme: National Strategy for Transformation (NST 1) 2017 – 2024"	Priority 6 of the 7yr development plan focuses on Modernize and Increase Productivity of Agriculture and Livestock. It intends to establish a comprehensive agricultural ecosystem financing program including lease financing and insurance with a focus on priority value chains
	Baseline: MSME insurance is a clear focus along the value chain.	
Tunisia	Financial Inclusion in Tunisia Low-Income Households and Micro-Enterprises September 2015 Public	Financial inclusion efforts are often targeted to low-income households and micro-enterprises—the focus of this document—however also concerns very small, small, and medium-size enterprises (VSSMEs). Half of the commercial banks and nearly all leasing firms view these VSSMEs as a priority segment. 71% of these VSSMEs are considered financially included and 80% of those that applied for banking financing were successful in receiving it
	Baseline: MSMEs are a priority but clear framework is required.	

By and large, it is important that V20 countries are able to: (1) reduce ex post financial burden on the government, (2) to improve the resilience of micro, small, and medium enterprises such as farmers to shocks, and (3) support expansion to credit to enable investment and increase

productivity. A cost-effective mix of solutions is key where adaptation and risks management measures, including insurance, complement each other.

REGULATION

During in-country consultations, it was noted that there is missing insurance regulatory or supervision in certain types of products such as for parametric insurance. This absence limits the ability of pilot projects to scale and/or does not encourage private sector to develop products. It is important to note that parametric insurance has the potential to advance climate protection.

In the absence of insurance products, when a shock occurs, MSMEs have limited risk mitigating options such as depleting savings, additional borrowing, or selling productive assets to bridge the funding gap. Access to insurance can play a meaningful role in reducing risks faced by micro, small, medium enterprises (MSMEs) by smoothening consumption (i.e. credit and inputs), building assets, absorbing shocks, and managing risks associated with irregular and unpredictable income. Nonetheless, insurance services remain out of reach for MSMEs.

The MSME protection and financing gap exists for a variety of reasons including being typically neglected in regulation as it falls between household (consumer protection) and corporations. Consumer protection regulations are usually tailor-made to protect individuals and not enterprises and thus consumer protection rules may require revisions to reflect the specifics of MSMEs. More recently, special regulation through social protection and initiatives[80] such as InsuResilience Global Partnership have been developed to improve access to insurance for low-income people, but little effort has been made in insurance for MSMEs. This may be due to the incorrect perception that MSME insurance is seen as traditional insurance.

This sentiment is shared by the Access for Insurance Initiative, as they recognize that inclusive insurance regulations (including micro-insurance or mass insurance regulations) are often conceptually designed around individual consumers, not MSMEs, even though the International Association of Insurance Supervisors' (IAIS) definition of inclusive insurance is comprehensive enough to incorporate MSME insurance: "inclusive insurance is used in this paper in the broad sense of the word, denoting all insurance products aimed at the excluded or underserved market, rather than just those aimed at the poor or a narrow conception of the low-income market. In developing

[80] https://www.adb.org/sites/default/files/publication/298101/insurance-msmes.pdf

countries, majority of the population often classifies as un- or underserved. Thus, inclusive insurance is a mainstream topic of relevance to the development of the retail insurance market as a whole."[81]

According to the ADB, MSME insurance products cannot be offered under most existing insurance regulations. In addition, the types of services that insurance firms or distribution channels could provide to entice insurance uptake by MSMEs through additional services such as consultancy and advice through distribution channels, is currently not permitted in many markets. Moreover, the distinct needs of MSMEs, such as for example the necessity to adjust the premium payment pattern to the economic cycle of MSMEs, is often seen to contradict current regulatory requirements on maintaining the validity of coverage[82].

This is complemented by the Access for Insurance Initiative[83] considerations for regulators, which recommends that the insurance regulatory framework should allow for innovative distribution channels and transactional platforms, which likely have the trust of and access by MSMEs (e.g. input suppliers, agent networks, etc.)

As this preliminary and high-level assessment of the policy and regulatory environments across V20 countries shows, current framework conditions are not very conducive to facilitating MSME-responsive product development and uptake. Moreover, in the context of climate-related insurance products, the regulatory challenges becomes even more distinct, as many particularly climate risk insurance products are typically based on parametric instead of indemnity-based contract designs. Parametric insurance, however, falls outside existing insurance regulations and would require the modification of current insurance frameworks. As the next chapter will show, this is also reflected by the low supply of climate-smart insurance products for MSMEs across V20 countries.

[81] IAIS Issues Paper Conduct of Business in Inclusive Insurance (2015)

[82] https://www.adb.org/sites/default/files/publication/298101/insurance-msmes.pdf

[83] Supporting responsible MSME insurance by Access for Insurance Initiative, November 2017

VI. CLIMATE-SMART INSURANCE LANDSCAPE ACROSS V20

STATUS OF INSURANCE MARKET DEVELOPMENT ACROSS V20 REGIONS

Mapping the levels of insurance uptake by MSMEs is no exact science[84] and the necessary data is often only limited available. One indicator, allowing to derive some general conclusions about the status of insurance uptake among private sector actors are countries' non-life insurance penetration rates. Non-life insurance penetration rates depict the ratio of underwritten premiums per annum in relation to the country's GDP. As the World Bank notes, "low-insurance penetration rates (therefore) mean that the private sector is underinsured"[85] [86]. While the private sector of V20 economies is not exclusively compiled of MSMEs but also bigger corporate actors, the below snapshot of V20 insurance penetration rates allows to infer low to no uptake of insurance uptake among MSMEs. This is because it is likely to expect that the bulk of products subsumed under the already low non-life insurance penetration rates is taken out predominantly by enterprises larger than MSMEs.

Insurance penetration rates for selected V20 members in Africa and Middle East[87]

Country	Insurance penetration rate (Non-life)	Year
Kenya[88]	2,8%	2018
Democratic Republic of Congo[89]	0,4%	2107

[84] Surminski UNEP DTU

[85] https://www.gfdrr.org/sites/default/files/publication/125551-WP-DRFTA-Report-Grenada-Final2018-LowRes-PUBLIC_0.pdf

[86] For matters of comparison: Non-life insurance penetration rate 2019 in Germany is 6.0%, in France 9.7% and in the US 14.8%. The US has one of the highest insurance penetration in the world. Fore more information, please see:

[87] Average non-life insurance penetration level across Africa: 3.5% https://www.oecd.org/pensions/insurance/Insurance-Markets-in-Figures-2019.pdf

[88] https://www.aibcapital.com/reports/253/show

[89] https://www.ey.com/Publication/vwLUAssets/EY-sub-saharan-africa-the-evolution-of-insurance-regulation/$FILE/EY-sub-saharan-africa-the-evolution-of-insurance-regulation.pdf

Uganda [90]	< 1% (life and non-life)	2018
Burkina Faso[91]	< 1% (life and non-life)	2017
Tanzania[92]	< 1% (life and non-life)	2013
Ghana[93]	1,1% (life and non-life)	2017
Malawi[94]	2% (life and non-life)	2017
Morocco[95]	3,48%	2016
Tunisia[96]	1,62%	2017
Lebanon[97]	2,18%	2017

Insurance penetration rates for selected V20 members in Latin America and the Caribbean

Country	**Insurance penetration rate (non-life)**	**Year**
Colombia[98]	2,8 % (life and non-life)	2017
Costa Rica[99]	2,3 % (life and non-life)	2017

[90] https://www.theeastafrican.co.ke/business/Kenya-insurance-sector-looks-to-a-brighter-future-/2560-4745222-ciyq12/index.html

[91] https://www.pwc.co.za/en/assets/pdf/south-african-insurance-2018.pdf

[92] https://www.ey.com/Publication/vwLUAssets/EY-sub-saharan-africa-the-evolution-of-insurance-regulation/$FILE/EY-sub-saharan-africa-the-evolution-of-insurance-regulation.pdf

[93] https://www.ey.com/Publication/vwLUAssets/EY-sub-saharan-africa-the-evolution-of-insurance-regulation/$FILE/EY-sub-saharan-africa-the-evolution-of-insurance-regulation.pdf

[94] https://www.ey.com/Publication/vwLUAssets/EY-sub-saharan-africa-the-evolution-of-insurance-regulation/$FILE/EY-sub-saharan-africa-the-evolution-of-insurance-regulation.pdf

[95] https://www.pwc.co.za/en/assets/pdf/south-african-insurance-2018.pdf

[96] https://www.pwc.co.za/en/assets/pdf/south-african-insurance-2018.pdf

[97] https://www.bankmed.com.lb/BOMedia/subservices/categories/News/20170127144803585.pdf

[98]https://www.fundacionmapfre.org/documentacion/publico/i18n/catalogo_imagenes/grupo.cmd?path=1098710

[99] https://www.fundacionmapfre.org/documentacion/publico/i18n/catalogo_imagenes/grupo.cmd?path=1098710

Dominican Republic[100]	1,4 % (life and non-life)	2017
Haiti[101]	< 1% (life and non-life)	2015
St. Lucia[102]	4,2 %	2015

Insurance penetration rates for selected V20 members in Asia-Pacific[103]

Country	**Insurance penetration rate (non-life)**	**Year**
Bangladesh	< 1%	2018
Philippines	< 1%	2018
Vietnam	< 1%	2018

CLIMATE-SMART INSURANCE PRODUCTS FOR MSMES ACROSS V20 REGIONS

While the above data gives an indication of the low uptake of insurance products by MSMEs in V20 countries, the subsequent regional snapshots show the limited availability of climate-smart insurance products for MSMEs. Most relevant products available in these regions cater to the micro level, particularly households and smallholders, while MSMEs fall outside the focus currently set by developers of climate risk insurance.

[100] https://www.fundacionmapfre.org/documentacion/publico/i18n/catalogo_imagenes/grupo.cmd?path=1098710

[101] https://books.google.de/books?id=6LCrDwAAQBAJ&pg=PA126&lpg=PA126&dq=Insurance+penetration+Haiti&source=bl&ots=RyosV-9_Xd&sig=ACfU3U2bHN3y2_tt6hsmUbFEVHb-TfVgxw&hl=de&sa=X&ved=2ahUKEwik8K-Iz8TkAhWrsaQKHdBtCXEQ6AEwB3oECAgQAQ#v=onepage&q=Insurance%20penetration%20Haiti&f=false

[102] https://reliefweb.int/sites/reliefweb.int/files/resources/125553-WP-DRFTA-Report-StLucia-Final2018-LowRes-PUBLIC.pdf

[103] https://www.lloyds.com/news-and-risk-insight/risk-reports/library/understanding-risk/a-world-at-risk

CLIMATE-SMART MSME INSURANCE PRODUCTS OF V20 MEMBERS IN ASIA PACIFIC

Below is a snapshot of MSME insurance in Asia-Pacific. Most of the examples are from Southeast and South Asia. Reason being, many pilots are conducted in the region. There has not been much scaling up due to the unsustainability of the solution such as dependence on a temporary subsidy, no engagement on financial literacy or climate risk literacy, and not taking into account a comprehensive approach to addressing climate risk where one would look into protection and productivity.

Though the examples below are from Bangladesh, the Philippines and Vietnam, there are other noteworthy V20 insights and progress such as:

- Bhutan has a crop insurance policy under discussion with RICBL, the national insurer, to address crop damages will enhance the food production, accessibility and food stability.
- Insurance companies operating in the Pacific perceive MSMEs as the market segment with the biggest potential for growth for the years to come[104]. However, a lack of insurance awareness amongst business owners, and the condition of some businesses (insurability) are hampering the speed at which insurance take up is happening amongst this market segment.
- Mongolia currently does not have insurance products documented that cater particularly for the SME sector[105].
- Nepal has no reinsurance capacity available for agricultural insurance. So far, only NLG insurance has been able to persuade their reinsurers, Hanover Re, to provide reinsurance coverage for their livestock portfolio but they do not have any coverage on their crop portfolio. In absence of reinsurance facility, three groups of insurers have formed a risk pool amongst themselves to share the cost in the event of any catastrophic events[106].
- In Papua New Guinea, a pre-feasibility study concluded that the potential to develop crop and livestock insurance products and programs is currently fairly restricted due to a lack of an agricultural insurance culture and functioning market, the lack of demand, and the lack of crop production, crop damage and weather data on which basis to design and rate such programs.

[104] http://www.pfip.org/newsroom/press-releases/2019-2/pacific-insurers-see-sme-and-group-business-as-a-way-forward-for-growth/

[105] http://www.inclusiveinsuranceasia.com/docs/MA-Mongolia.pdf

[106] http://www.inclusiveinsuranceasia.com/docs/MA-Nepal.pdf

The study identified parametric or index-based crop insurance products for the cash crop/plantation export crops and food crop sectors that might be developed[107].

Country	MSME Industry	Product Information	Type of Climate Risk	Project Partners
Bangladesh	Agriculture	Weather Index Insurance	Drought, excess rain, heat waves, and cold spells (any season for any crop)	IFC's GIIF Business Finance for Poor-Bangladesh (BFP-B) Challenge Fund & Agriculture Value Chain Project of USAID Green Delta Insurance Company (GDIC)
	Agrilcuture, small-holder farmers	Index-based Flood Insurance at the meso-level	Flood, parametric	Pragati Insurance via Manab Mukti Sangstha (MMS) Institute of Water Modeling Pragiti General Insurance Swiss Re
Philippines	All industries	MicroBiz Protect Priced at around P2 per day or P730 per year can insure enterprises for P100,000 up to P500,000	Typhoons and floods	AXA Philippines Cebuan Lhuillier

[107] https://www.indexinsuranceforum.org/project/feasibility-study-crop-and-livestock-index-insurance-papua-new-guinea

	All industries	WeatherProtect	Typhoons and floods	One CISP (Insurance Cooperative)
	Store owners (retail)	Multi-Risk Insurance	Multi-risk insurance	CARD Pioneer Microinsurance, Inc.
Vietnam	Index-Based Risk Transfer Products to Facilitate Micro Lending in Agriculture	Index-Based Risk Transfer Products to Facilitate Micro Lending at the meso-level Loan default - Agriculture	Extreme and early arrival of the annual flood; Interrupts harvest completion of summer- autumn rice crop; Excess river flow	Bao Minh
Vietnam	Commune with up to 20% subsidy from government Paddy rice and livestock	Government's Trial Agricultural Insurance Programme	Area-yield index-based; will compensate for a commune's losses resulting from below average yield output.	Bao Viet/Bao Minh VINARE

CLIMATE-SMART MSME INSURANCE PRODUCTS OF V20 MEMBERS IN LATIN AMERICA AND THE CARIBBEAN

Below is a snapshot of climate-related insurance in Latin America and the Caribbean. Most of the examples are for small holder farmers in Latin America while the Caribbean is for all groups and pooled to reach scale. Small family farms make a fundamental contribution to the economies and the food security of the countries in the region. They account for more than 60% of agricultural outputs in Central America . Smallholder farming is the predominant sector in the rural economy of Latin America . The financial inclusion and development policies clearly show support for MSMEs. Climate-smart insurance, if included with market linkages, improved efficiency, reduced losses and improvements in creditworthiness, can be a target of existing products/services.

Country	**MSME Industry**	**Product Information**	**Type of Climate Risk**	**Project Partners**

Colombia	Smallholder Farmers	Blue Marble Microinsurance	weather index insurance	Aspen Insurance Holdings; Guy Carpenter & Company, LLC; together with Marsh & McLennan Companies; Hamilton Insurance Group; Old Mutual Emerging Markets; Transatlantic Holdings; XL Insurance (UK) Holdings; and Zurich Insurance Company, and the latest addition, ASSA Insurance (Panama).
	Smallholder Farmers (Banana)	Mapfre Seguros	multi-peril crop insurance (Crop and livestock insurance)	Government subsidies
	Smallholder Farmers	Liberty insurance QBE insurance	livestock insurance	
	All	Energy Savings Insurance	Covers the damages incurred from not obtaining the estimated energy savings.	SURA, technology providers as buyers of the insurance product, and Banco Davivienda of Colombia bank
Dominican Republic	crops and livestock	Aseguradora Agropecuaria Dominicana SA (AGRODOSA)	multi-peril insurance	
Honduras	Smallholder Farmers	Intermericana, Equidad, Atlantida	multiple peril crop and livestock insurance	state-owned bank BANADESA requires farmers to insure their agricultural loans on a compulsory basis.
St. Lucia, Jamaica, Grenada	Individuals, cooperatives and businesses at all income levels	Climate Risk Adaptation and Insurance in the Caribbean (CRAIC) II	Weather index-based parametric insurance - Index insurance for any non-salary income earner banking with participating credit unions	MCII, CCRIF SPC, ILO, Munich Re, GK Insurance, EC Global and DHI, BMU

CLIMATE-SMART INSURANCE PRODUCTS OF V20 MEMBERS FROM AFRICA AND THE MIDDLE EAST

Below is a snapshot of climate-related insurance in Africa. Most of the examples are for small holder farmers. Reason being, much like Latin America in terms of significance, more than 60% of the sub-Saharan African population is smallholder farmers, and about 23% of sub-Saharan Africa's GDP comes from agriculture[108]. Seeing that Africa has the capacity to produce two to three times more cereals and grains, which can add 20% more cereals and grains in global supply, with similar production prospects in horticulture crops and livestock, it would be beneficial to include enhanced productivity measures with insurance products[109].

Country	MSME Industry	Product Information	Type of Climate Risk	Project Partners
Tanzania	Crops - smallholders (individuals) farmers, producers, famer's cooperatives, input suppliers, banks, and buyers	Climate-KIC winners programme	Multi-peril insurance (extreme weather or crop failure)	"1. World Food Program 2. Ecole Polytechnique 3. University of Reading 4. University of Hamburg 5. Sainsbury 6. University of Reading 7. World Food Programme's Patient Procurement Platform 8. WillisWatsonTowers 9. Official development assistance (ODA) actors 10. African Development Bank 11. World Bank Group 12. The International Finance Corporation 13. Climate Justice Resilience Fund (CJRF)

[108] https://www.mckinsey.com/industries/agriculture/our-insights/winning-in-africas-agricultural-market

[109] https://www.mckinsey.com/industries/agriculture/our-insights/winning-in-africas-agricultural-market

Ethiopia	Agriculture	R4 Rural Resilience		GCF, Oxfam America, France, USAID, Norway, Rockefeller Foundation, Swiss-Re, Cargill Foundation, ANCAR, ANAC IM, BAMTAARE , Caritas Kolda, CEERAS, CNAAS, IFAD, INP, La Lumière, PlaNet Guarantee, PA SA, PAP IL, Swiss Re, SEN RE, U-IMCEC
Ethiopia	Teff, Wheat and Haricot Bean for "Lumme-Adama Farmers Corporative Union (LAFCU)"		Double Trigger Multiperil Crop Insurance (DTMPCI); Weather Index Crop Insurance (WICI)	Nyala Insurance S.C. (NISCO) Oxfam America and the Colombia University
Burkina Faso	Cotton, corn	Assurance Récolte Sahel (Sahel crop insurance)	index-based insurance products	PlaNet Guarantee, Oxfam, Allianz Africa, Swiss Re , EARS, CNAAS
Kenya, Malawi	households and micro, small and medium enterprises (MSME		multi-peril crop insurance for clients	DFID (UK); InsuResilience Investment Fund; German development bank KfW; BlueOrchard Finance
Ethiopia	Smallholder (individual) farmers for crops	LEAP- Livelihoods, Early Assessment and Protection	Severe droughts or flloods (index-insurance)	World Food Programme Government of Ethiopia
Mali and Uganda	Smallholder farmer	G4AW-Scaling Up Mirco-Insurance (SUM)	Weather-index insurance for crop	EARS Earth Environment Monitoring, Netherlands Space Office, Dutch Ministry of Foreign Affairs,

Ghana	Smallholder farmer	WorldCover	Weather-index insurance for crop	MFI (Microfinance Institution) Bank / Fund Manager NGO Government Program Agri Business (Fertilizer, Tractor, Seed or Input Dealer) International Food & Beverages Company

VII. BARRIERS TO THE IMPLEMENTATION OF CLIMATE-SMART MSME INSURANCE

Given the potential benefits of insurance, MSMEs' relevance for economic development as well as the ambitious plans several vulnerable countries put forward regarding the development of inclusive financial systems, what causes the low MSME insurance penetration rates regarding climate risks and investments?

First and foremost, the focus on climate-related risks and investment opportunities is still a relatively new field, which only received increased attention recently. What's more, however, are the underlying barriers, which prevent introduction and uptake of climate-smart insurance products even in countries with operative or concluded pilots.

REGULATION AND ENABLING POLICY FRAMEWORKS:

Specifically for parametric insurance, which can be considered a preferred instrument especially for low-income markets, regulation is often missing. Parametric insurance products are typically defined as 'derivatives', meaning financial contracts whose value is based on ('derived from') an agreed-upon underlying financial asset or asset groups.[110] In the case of index-based climate risk insurance, for example, the value of the insurance product, that is, the maximum coverage, would be based on the expected financial losses associated with e.g. weather-related reductions of agricultural yields.[111] They are therefore not obviously correlated to the actual damage. Indemnity-based insurance indemnify (parts of) the actual damage based on ex-post assessments. Climate-risk insurance products, being usually based on parametric insurance contracts, are thus not easily accommodated within existing regulatory systems and even considered as 'gambling' by some policymakers.[112] While several countries approve parametric insurance on a case-by-case basis for

[110] https://books.google.de/books/about/Financial_Derivatives_in_Theory_and_Prac.html?id=2-FJDJ_nAFwC&redir_esc=y

[111] http://www.climate-insurance.org/fileadmin/mcii/pdf/DiscussionPaperSeries/MCII_Discussion_Paper_Vol3_UnderstandingCost-Effectiveness_final.pdf

[112] https://www.inclusiveinsuranceasia.com/docs/Toolkit_Publication_Final.pdf

specific pilots (Sandbox approach),[113] the lacking signals for long-term regulatory changes may disincentive product development and introduction.

In a wider context, other fiscal policies also play a role for strengthening insurance uptake. While MSMEs are a highly diverse group in themselves, many of them are constrained in their financial capacities and may run into affordability issues. Value-added taxes (VAT) applied to the insurance purchase as well as income taxes applied to insurance payouts can thus be considered potential levers that could be pushed to increase the affordability of insurance products.[114] Moreover, as indicated below, the appropriate distribution channels to market insurance for MSMEs are often lacking and the development of new and innovative channels may fall outside existing regulation.[115] The licensing of new delivery channels may, however, be very lengthy. Therefore, product introduction may be expected to be delayed or even suspended and thus dis-incentivize product development.

In an even wider context, other policy measures enabling behavioral change and cost-effectiveness of insurance also play a role. Several studies focusing on the vulnerabilities of MSMEs highlight low climate risk awareness levels, with many MSMEs settling in disaster-prone areas.[116] This, in turn, negatively affects their insurability and reduces the cost-effectiveness of insurance. Non-structural legislative measures, such as the introduction of building or settlement codes, could help reduce such risks. Furthermore, several risks remain outside the risk mitigation space of MSMEs, such as logistic risks related to transport or protective, climate-smart infrastructure (e.g. flood protection).[117] Policymakers could support, for example, the introduction of investment targets for climate-proof infrastructure, thereby further increasing the cost-effectiveness and feasibility of insurance.

CONSTRAINED FINANCIAL AND TECHNICAL CAPACITIES:

As noted before, MSMEs face significant constraints regarding their financial capacities. Access to credit, for example to invest in risk-reducing or energy saving measures, is very limited due to a lack

[113] Consultation 2 and and 4

[114] https://www.inclusiveinsuranceasia.com/docs/Toolkit_Publication_Final.pdf

[115] https://www.adb.org/sites/default/files/publication/298101/insurance-msmes.pdf

[116] https://microinsurancenetwork.org/sites/default/files/GIZ%20Inclusive%20Insurance%20Factsheet%20Series%20-%20Insurance%20for%20Micro%2C%20Small%20and%20Medium%20Enterprise%20Development.pdf

[117] https://unfccc.int/sites/default/files/resource/MCII%20Submission%20to%20the%20Excom_Feb2018.pdf

of collateral or equity (e.g savings and assets), financial records or exposure to systemic risks. Similarly, insurance price points are often too high to be considered attractive investments by MSMEs. In the absence of means to improve their risk profile and thus reduce their premium offerings, MSMEs may get stuck in a negative feedback loop, preventing any meaningful risk management measures. Yet, the capacity of Microfinance Institutions (MFIs), often the main capital providers for MSMEs, to give out subsidized emergency nat-cat loans may shrink severely ex-post disaster. Since MFIs typically operate locally, the majority of its client base may be simultaneously affected by extreme weather and therefore seek to access contingent credit lines, thereby putting the MFI's liquidity under severe stress. Insurance for MSMEs as well as the MFIs themselves may therefore be beneficial to spread the overall risk of default and maintain urgently needed liquidity.[118] [119]

Several MSMEs in developing countries are furthermore not aware of the risks they are exposed to, and even less so of potential options for addressing them: Value chain vulnerability analyses and business continuity planning are often not well known or understood.[120] [121] Further, in misinterpreting the long term nature of climate risks as negligible, the value of expensive adaptation and prevention measures is often not recognized.[122] In effect, sustainable risk management fails not only due to the lack of financial resources, but due to MSMEs' prior incapacity to understand risks and response options.[123] Some studies, however, also show that MSMEs, once aware of their risk, are increasingly *willing* to implement diversification strategies or input and technology upgrades, or to invest in structural risk reduction or risk transfer.[124]

Another barrier to insurance market development are low levels of financial literacy and trust in financial products, especially insurance.[125] As observations show, the former often conditions the latter: Regarding the scope of their coverage, MSMEs may misunderstand the distinct features of their insurance contract. In effect, their claims may be deemed non-admissible and the policyholder

[118] World Bank GFPI Paper

[119] https://www.inclusiveinsuranceasia.com/docs/Toolkit_Publication_Final.pdf

[120] http://www.zaragoza.es/contenidos/medioambiente/onu/983-eng.pdf

[121] https://www.econstor.eu/bitstream/10419/64267/1/717874087.pdf

[122] https://indexinsuranceforum.org/resilience-document/roadmap-integrated-climate-risk-management-flood-risk-and-micro-small-and-medium

[123] https://unepdtu.org/wp-content/uploads/2019/04/msme-adaptation-updated-web-2.pdf

[124] World Bank GFPI Paper

[125] https://www.preventionweb.net/files/1742_SEEDRFinancing.pdf

may feel misled.[126] [127] This may, in turn have detrimental consequences for the policy's renewal rate and hence the cost-effectiveness and sustainability of the insurance product.

DISTINCT (RISK) PROFILES AND HIGH TRANSACTION COSTS:

As a client segment, targeting MSMEs may be considered unattractive for several reasons. For one, micro enterprises are often too small to be of interest for larger finance institutions. MFIs, however, may cater predominantly to a household-level client basis. Micro-enterprises, while resembling households to some degree may require additional product features beyond those of personal insurance offerings.[128] Small and medium enterprises on the other hand, fall in the missing middle: They are too big for MFIs, yet often also too small and too risky for the formal banking sector. In addition, MSMEs, especially micro enterprises, often have less formalized or very distinct cash flows, due to which they either fall out of a marketable client base or require distinct premium payment systems that accommodate MSMEs' differing, and often times more irregular economic cycles.[129] [130]

Further to the above, MSMEs often come with a very distinct risk profile - they are more dependent on personal risks, more dependent on local markets, and often more tied to individual value chain commodities or products, with less control over prices and hence revenues. This, in addition to a lack of understanding of the potential MSME client base, also supports MSMEs' unattractiveness for insurers.[131]

Moreover, the distribution costs associated with marketing insurance to MSMEs represent a substantial barrier for insurers to enter the market. Often there are no feasible delivery mechanisms to reach MSMEs, which makes the collection of premium payments and the disbursement of payouts very difficult. In some countries, insurers work with intermediaries, such as farming cooperatives or agricultural input providers, which either bundle the insurance with other products, e.g. drought-resistant seeds or buy several insurance policies for their membership. While technology and digitization, for example in the context of mobile sales, payments and services

[126] World Bank GFPI Paper

[127] https://www.adb.org/sites/default/files/publication/298101/insurance-msmes.pdf

[128] https://www.adb.org/sites/default/files/publication/298101/insurance-msmes.pdf

[129] Ibid

[130] https://www.inclusiveinsuranceasia.com/docs/Toolkit_Publication_Final.pdf

[131] https://indexinsuranceforum.org/resilience-document/roadmap-integrated-climate-risk-management-flood-risk-and-micro-small-and-medium

could play an increasing role for delivering insurance to underserved market segments, investments in both, the creation of such technological platforms as well as the modification of existing regulatory environments, may be considered too expensive. Apart from that, introducing technology-based distribution channels, such as mobile payment systems, comes with its own challenges, for example for safeguarding telecommunications systems against damages to ensure seamless transmission after a natural hazard.[132]

All the above features sustain the high transaction costs associated with investing in developing and supplying insurance products for MSMEs. As one can see, these already represent significant barriers in themselves. The design of climate-smart insurance products, however, may be linked to even higher transaction costs for insurers: In addition to catering to an unknown client base, for many insurers developing climate-smart insurance products also comes with assessing and pricing unknown climate risks. For adequately pricing risk, expected claims need to be quantified. For doing so, insurers and actuaries usually rely on historic loss or claims data. This, however, comes with two challenges - For one, the necessary data is often hardly available for countries with low insurance penetration rates.[133] Moreover, since climate change is projected to lead to increasingly frequent and severe extreme weather events, modelling techniques based on historical weather statistics may not be sufficient anymore to adequately predict future weather-related risks and damages.[134]

[132] https://www.inclusiveinsuranceasia.com/docs/Toolkit_Publication_Final.pdf

[133] https://www.adb.org/sites/default/files/publication/298101/insurance-msmes.pdf

[134] https://unfccc.int/sites/default/files/resource/010818%20REPORT%20OF%20THE%20SUVA%20EXPERT%20DIALOGUE.pdf

VIII. SUMMARY OF V20 NEEDS FOR ENHANCING CLIMATE-SMART MSME INSURANCE

As the analyses of the previous sections have shown, building climate-smart risk insurance menus in V20 economies will necessitate bridging substantial gaps and complementary and coordinated action by a plethora of actors. The subsequent section will capture the challenges highlighted throughout the paper and propose activities and actors relevant for addressing them.

STAGE 1: UNDERSTANDING AND DEVELOPING RESPONSES TO CLIMATE-RELATED BUSINESS RISKS

As observations from previous sections show, affected MSMEs often do not fully understand the particular climate risks they face and how these translate into impacts for their operations and balance sheets. This can be due to several reasons - the lack of necessary climate data and information services, of adequate risk assessment and financial modelling tools and of business management and response strategies in the context of disaster-related disruptions, which often affect several parts of the value chain. The individual challenges will certainly be different across and even within countries. What they do show though, is that a network of supporting actors will be needed early on to implement one or more of the following functions:

- **Universities/Research networks, insurers**: Identify weather risk, related loss data needs and efficiency or productivity gains from low-carbon technology relevant for MSMEs' information needs
- **Universities/research networks, insurers, technology providers**: Develop and/or enhance access to actionable weather risk and loss modeling data; Provide a menu of

low-carbon technology options to realize efficiency or productivity gains for various stakeholders, including MSMEs

- **Technical assistance providers, national planning and finance ministries**: Perform vulnerability and climate risk analyses, as well as cost-benefit analyses from the use of low-carbon technology and identify key economic sectors and value chains
- **Business associations, technical assistance providers, national planning agencies, and NGOs:** Develop tools and train MSME (owners) regarding:

→ Translating sector/value chain vulnerability and cost-benefit analyses into financial and operational business impacts

→ Developing business continuity and disaster response plans to identify key assets, activities, personnel, and response options

STAGE 2: RISK MANAGEMENT AND ENABLING FRAMEWORK CONDITIONS

Doing so will help to set the stage for applying comprehensive risk management practices, including but not limited to insurance. Such practices should also entail the diversification of business operations and suppliers, technology upgrades and business model transformations. Taking these necessary steps in the context of risk assessments and response planning will allow the MSME owners to better understand their risk management needs. Often, however, either due to lack of understanding and awareness, and often because of a lack of financial resources, MSMEs are forced to resort to negative coping strategies, such as selling assets or ceasing business operations entirely. Additionally, various impacts remain beyond their control, especially in relation to climate impacts that translate into negative effects on the logistics and market fronts. Together with MSMEs, the following actors should address these challenges by

- **Technical assistance providers, insurers, business associations, industry associations, national chambers of commerce and industry, and NGOs**: Identify different risk management options, including business model upgrades, climate-proof investments in business infrastructure, risk transfer, investments in low-carbon technology for energy savings, and value chain responses

- **Universities/Research networks, insurers, technology providers and technical assistance providers**: Develop actionable tools which integrate risk layering, business continuity and disaster preparedness planning to adequately identify cost-effective insurance potentials
- **Technical assistance providers, insurers, technology providers and national planning and finance ministries**: Identify, prioritize and facilitate large scale risk reduction investments, which lie beyond the reach of MSMEs, e.g. large-scale investments in climate-proof infrastructure or decentralized renewable energy systems, and create policy and regulatory frameworks incentivizing risk reduction

STAGE 3: PRODUCT DESIGN

Building on the above, insurance may be identified as a means to cost-effectively protect an MSME against risks that cannot be mitigated through risk reduction investments. Yet, this alone cannot substantiate adequate product design or uptake. MSMEs frequently fall in between market segments, since they are usually too big for the micro-insurance market, while too small for corporate insurance offerings: As an economic entity, micro enterprises can often be rather interpreted as households and show a stronger need for personal insurance components. Small and medium enterprises with a bigger asset base and more employees have rather asset-based insurance needs, but their particular product needs still differ from those of the corporate sector. And since the MSME segment is not well known among insurers, few products correspond to these requirements, while MSMEs often not only lack financial literacy and understanding of insurance, but also trust in the sector as a whole.

- **NGOs, universities/research networks and business associations**: Strengthen financial literacy of MSMEs and increase understanding of insurance products regarding own needs and contractual limitations to build informed demand
- **National planning authorities, finance ministry, industry, business and insurance associations**: Build strong communication channels between the insured and the insurer to allow for exchange

- **Technical assistance providers**: Build insurers' capacity regarding their understanding of climate-related portfolio risks, climate-related business opportunities, such as the provision of additional advisory services, and climate-smart product design features, including pricing and needs-responsive product bundling
- **Technical assistance providers, finance ministry, insurers, business associations**: Ensure that insurance contracts are designed to include broader development objectives, including efficiency gains/productivity enhancement, growth-orientation, and resilience
- **Technology providers, cooperatives/mutual insurance, MFIs**: Enhance data collection services and facilitate the development of innovative solutions such as climate risk endowment funds to reduce basis risk and build trust in insurance

STAGE 4: DISTRIBUTION CHANNELS AND OTHER ACCESS PRE-REQUISITES

While needs-responsive product development is important, two further relevant hurdles are the creation of necessary regulatory interventions, as well as providing actual access to the product through the build-up of distribution channels. Regarding the latter, the following actors should:

- **Technical assistance providers, insurers, brokers, cooperatives, actors in upstream supply chain activity, business associations and/or NGOs**: Work to create or engage with aggregators, which have the capacity to collect premiums and disburse payouts to a broad MSME client base
- **Fintech, Technology providers, and mobile services**: Create and expand distribution channels through digitization/mobile applications allowing for secure and quick disbursements

STAGE 5: REGULATION, ACCESSIBILITY AND AFFORDABILITY

Finally, regarding policy-making and regulation, several framework conditions may have to be addressed to enable product acceptance, uptake and effectiveness:

- **Finance ministries, regulatory bodies, and insurance associations**: These bodies should be involved early on to successfully facilitate product approval, e.g. for parametric insurance products, or supportive sandbox approaches
- **Finance ministries and regulatory bodies**: If required, adapt regulatory framework conditions to allow for innovative marketing and distribution of insurance products
- **Finance ministries and departments of trade and industry**: Enable more needs-responsive product (payment) requirements by allowing MSMEs and the insurance industry to accept premium payments based on MSMEs' distinct economic cycles
- **Finance ministries and central banks**: Enhance affordability and/or encourage business continuity plans through fiscal incentives by reducing or eliminating value-added tax (VAT) on premium payments and/or income taxes on insurance payouts.

IX. HIGH-LEVEL ASSESSMENT OF AVAILABLE SUPPORT FOR CLIMATE-SMART INSURANCE FOR MSMES

The above created "ecosystem" of actors working together to build a sustainable climate-smart insurance menu, will need substantial support, coordination and resources throughout the different stages. Traditionally, the V20 have strongly engaged with regional multilateral development banks (MDBs). However, looking at the wealth of tasks ahead, it is clear that regional MDBs cannot finance or manage these tasks alone. Several complementary actors will be needed either for particular stages or even throughout:

DEDICATED RESEARCH PLATFORMS:

As previous chapters showed, developing sustainable climate-smart insurance solutions requires a vast array of additional research, most notably in the areas of (1) enhancing the availability of customized and actionable data for MSMEs, (2) understanding climate impacts and resilience/risk management approaches for MSMEs, and (3) identifying MSMEs' specific product requirements pertaining to insurance and other financial services. This work would also include the development of specific financial models, allowing to quantify the impacts of climate change on MSME balance sheets.

Below is a snapshot of research platforms which work or could work in one or more of the aforementioned areas:

Snapshot of relevant research platforms

Name	Relevant Focus Areas	Project Snapshot
Danish Ministry of Foreign Affairs, UN Environment and Technical University of Denmark (UNEP DTU) Partnership	Creating Business Models and Markets for green technology. Supports governments, cities and private sector to act on climate change through market development and innovative business models.	**Private Sector Engagement in Climate Change Adaptation**. Contributes to strengthening the business case for adaptation from a developing country business perspective, with a particular focus on small and medium size enterprises (SMEs), which are particularly vulnerable to climate change.

SME Finance Forum	The Forum operates a global membership network that brings together financial institutions, technology companies, and development finance institutions to share knowledge, spur innovation, and promote the growth of SMEs. It is a knowledge center for data, research and best practice in promoting SME finance.	**eLearning:** Credit Information Systems Focusing Small and Medium Enterprises. This course is intended to provide SMEs with the knowledge about MSME financing, credit information sharing, the role of credit information service providers, credit Reports, credit Score, and dispute resolution process.
International Research Institute for Climate and Society, The Earth Institute, Columbia University	The IRI conducts this mission through strategic and applied research, education, capacity building, and by providing forecasts and information products with an emphasis on practical and verifiable utility and partnership. The Financial Instruments Sector Team helps people overcome climate risk through financial tools like index insurance and index-based disaster risk management.	Through partners, collaborators, and educational activities, IRI engages the players necessary to represent the wide array of expertise and perspectives and build community driven solutions.
Centre for Financial Inclusion	The Centre develops insights, advocate on behalf of clients and collaborate with stakeholders to achieve a comprehensive vision for financial inclusion.	**Building Financial Capabilities and Strengthening Institutions Through Customer-Centered Innovations**. The project aims to enhance financial customer engagement by building their capabilities. It also aims to develop and promote digital tools that FSPs can use to diagnose clients' financial health, identify gaps, and develop actionable plans to improve financial well-being.
Global Centre for Disaster Protection	The Centre sources innovative ideas and leverage their partners to bring about change in the way money is programmed for disaster	**Executive Training Course on Disaster Risk Financing**. The Centre delivered a five-day training course on disaster risk

	and crisis risk management. It also provides operational support to low and middle income country governments, and development partners and regional institutions, such as risk pools. It provides targeted, demand-led support to institutions seeking to build strategies and programmes that reflect the principles of crisis risk financing.	financing for 23 officials from Ministries of Finance from 19 countries in July 2018. **Innovation Lab**: Innovative Financing for Refugee Crises: The Centre convened this Innovation Lab to discuss ideas and options for financing responses to the global refugee crisis, with the aim of influencing global policy and action
Economic Research Institute for ASEAN and East Asia (ERIA)	ERIA examines factors that could help improve SMEs, such as effective knowledge sources, productivity nexus, innovation constraints and determinants for SMEs, and access to finance. ERIA also leads research around government policies and regulatory support for SMEs like SME trade policy, SME investment policy, and competition laws.	**Comprehensive Asia Development Plan**. ERIA has conducted a series of research projects to aid the formulation of the Comprehensive Asia Development Plan (CADP), in response to a request from the leaders of the East Asia Summit, as 'a coherent master plan, which would contribute to coordinating, expediting, upgrading, and expanding sub-regional initiatives and promoting private participation.'
International Society for Small and Medium Enterprises (ISSME)	Financial Inclusion.Finance as one of the major challenges for SMEs' growth and expansion is a high priority topic	Undertake empirical studies to find out real issues preventing access to finance by SMEs. Organize specific events by bringing together SMEs and financial institutions at one platform for effective discussions and to come up with best solutions facilitating access to finance. Disseminate information on alternative modes of finance and globally emerging best practices on financial inclusion. Team up with various financial institutions and groups worldwide to mitigate SMEs' financial problem.
Grantham Research Institute on Climate Change and the Environment	Creates a world-leading centre for policy-relevant research and training on climate change and the environment, bringing together international expertise on economics, finance, geography,	**Research.** Pricing ambiguity in catastrophe risk insurance. The authors of this paper apply a newly developed insurance pricing model to two catastrophe model data sets relating to hurricane risk in two locations in the

	the environment, international development and political economy. It has established a world-leading reputation for research and policy analysis on environmental problems, with a focus on climate change. The focus of the Sustainable Finance group is how to effectively mobilise finance to deliver climate action and sustainable development.	Atlantic basin. The model considers an insurer who maximises expected profit but is sensitive to how ambiguity affects its risk of ruin.
Oxford Policy Management (OPM)	OPM responds to the impact of natural disasters by designing, implementing, and evaluating policies and strategies that provide for disaster preparedness, response, and recovery, and helping governments understand and implement risk financing measures. Our projects focus on diverse areas including flood management, vulnerability assessment, early warning, emergency cash-transfers, and disaster insurance.	**Shock-Responsive Social Protection Systems (SRSP).** This project investigates how social protection systems can scale up to respond to shocks in low-income countries, and fragile and conflict-affected states.
Cambridge Institute for Sustainability Leadership (CISL)	CISL is a globally influential Institute developing leadership and solutions for a sustainable economy. CISL's interdisciplinary research engagement builds the evidence base for practical action, through a focus on six cross-cutting themes critical to the delivery of the SDGs: sustainable finance, economic innovation, inclusive development, natural capital, future cities and leadership.	CISL's ten-year plan to rewire the economy to deliver the UN Sustainable Development Goals (SDGs) provides an umbrella and context for much of the research work. At present, CISL publishes a combination of academic working papers, practitioner-based reports and short articles.

Munich Climate Insurance Initiative (MCII)	MCII finds and promotes effective and fair insurance-related solutions for the risks posed by climate change by bringing together experts from research institutes, the insurance sector, civil society, and climate adaptation practice. Through its unique set-up as a non-profit think tank and incubator, MCII provides a forum to explore solutions in creating incentives and changing structures for risk reduction for people with no access to risk management at present, particularly the most vulnerable people in low-income regions. We want to add value to the most vulnerable people and communities, guided by the principles of (1) integrated approaches, (2) economic efficiency, (3) responsibility and (4) people-centered solutions.	**Andvancing Climate Risk Insurance plus (ACRI+).** The project's aim is to develop strategic frameworks for low income countries and emerging economies in how to integrate climate risk insurance in their climate risk management plans.
ClimateWise	ClimateWise is convened by the University of Cambridge Institute for Sustainability Leadership (CISL). ClimateWise supports the insurance industry to better communicate disclose and respond to the risks and opportunities associated with the climate-risk protection gap. This is the growing divide between total economic and insured losses attributed to climate change.	**Advisory services.** CISL supports organisations to build long-term resilience, gain competitive advantage and identify new opportunities for value creation that are aligned with the transition to a sustainable economy.

DEDICATED TECHNICAL ASSISTANCE INITIATIVES:

Similarly, substantial capacity-strengthening should happen on four fronts, the insured, the insurer, the intermediaries and the policymakers/regulators. Translated into action areas, training and

general capacity-building/strengthening would be needed particularly in relation to (1) Financial and climate risk literacy and awareness of MSMEs, (2) Climate-responsive planning for MSMEs, (3) Product/service development or enhancement, (4) Distribution channel development or enhancement, and (5) Policy and regulation. Naturally, some of the actors grouped within dedicated research initiatives could overlap.

Below is a snapshot of technical assistance platforms which work or could work in one or more of the aforementioned areas:

Name	Relevant Focus Areas	MSME Relevance
Global Facility for Disaster Reduction and Recovery	GFDRR provides analytical work, technical assistance, and capacity building to help vulnerable nations improve resilience and reduce risk	Financial and climate risk literacy and awareness of MSMEs, Climate-responsive planning for MSMEs, Product/service development or enhancement, Policy and regulation
ILO Impact Insurance Facility	The ILO's Impact Insurance Facility is enabling the insurance sector, governments, and their partners to embrace impact insurance to reduce households' vulnerability, promote stronger enterprises and facilitate better public policies. The Facility's Vision includes the development of a strong and inclusive insurance markets to boost the productivity of enterprises	Financial and climate risk literacy and awareness of MSMEs, Climate-responsive planning for MSMEs, Product/service development or enhancement, Distribution channel development or enhancement, and Policy and regulation
Pacific Financial Inclusion Programme (PFIP)	PFIP is a Pacific-wide programme that has helped more than two million low-income Pacific islanders gain access to formal financial services and financial education. It does so by funding innovative approaches in development of financial services, supporting policy and regulatory initiatives, and empowering consumers.	Financial and climate risk literacy and awareness of MSMEs , Climate-responsive planning for MSMEs
RFPI Asia	The Regulatory Framework Promotion of Pro-poor Insurance Markets in Asia (RFPI Asia) program seeks to improve access to insurance in the region by building the capacities for insurance regulation and supervision and by promoting the development of innovative insurance solutions for the low-income sector.	Financial and climate risk literacy and awareness of MSMEs, Climate-responsive planning for MSMEs, Product/service development or enhancement, Distribution channel development or enhancement, and Policy and regulation

Climate Expert	The Climate Expert website provides Materials, tools and guidance for SMEs and multiplier organisations aimed at raising awareness and building practical skills of SMEs to prepare for the impacts of climate change. For this purpose the website contains the online learning programme "Becoming a Climate Expert" for companies as well as a Toolbox with materials and further information on a related training programme.	Financial and climate risk literacy and awareness of MSMEs, Climate-responsive planning for MSME
SME Finance Forum	The SME Finance Forum works to expand access to finance for small and medium businesses. The Forum operates a global membership network that brings together financial institutions, technology companies, and development finance institutions to share knowledge, spur innovation, and promote the growth of SMEs.	Financial and climate risk literacy and awareness of MSMEs, Product/service development or enhancement, Distribution channel development or enhancement
Insurance Development Forum	The IDF aims to optimise and extend the use of insurance and its related risk management capabilities to build greater resilience and protection for people, communities, businesses, and public institutions that are vulnerable to disasters and their associated economic shocks.	Product/service development or enhancement, Distribution channel development or enhancement, and Policy and regulation.
Access to Insurance Initiative (A2ii)	Implementation arm of the International Association of Insurance Supervisors (IAIS) on Inclusive Insurance. We generate and disseminate knowledge, build capacity, contribute to IAIS standard-setting, we foster learning and dialogue, support implementation at the regional and national levels, and participate in global advocacy processes.	Policy and regulation.

DEDICATED FINANCING VEHICLES:

To source the financial resources needed to implement the above as well as to enhance affordability through direct and indirect premium support, dedicated financing vehicles are needed to support both, the more general technical assistance requirements in relation to capacity-building as well as individual product design. Such vehicles can be grouped into multi- and bilateral financing vehicles identified with view to their individual focus areas, including on (1) Support for MSME insurance,

(including both, product development and enhancing insurance and re-insurance risk capital), (2) Support for data and integrated risk management needs and (3) Support for other risk financing solutions (e.g. macro and micro insurance products, contingent credit lines, etc.). Individual financing vehicles could, for example, administer and channel dedicated SIF funds to (1) support product development, (2) enhance insurers' risk capital, or to (3) enhance re-insurers' risk capital and/or support reinsurers in the development of reinsurance products relevant for the MSME insurance context.

Below is a snapshot of (dedicated) financing vehicles which work or could work in one or more of the aforementioned areas:

Name	Relevant Focus Areas	Nature of the Fund/Support	MSME Relevance
InsuResilience Solutions Fund (ISF) Funded by KfW on behalf of BMZ (Germany) Managed by the Frankfurt School of Finance and Management	Development of new climate risk insurance products, especially for governments. Scale-up of already existing, piloted products, e.g. into other regions or to other groups. Investment in technological solutions to improve and scale-up insurance operations,	Provides grants up to 2.5m EUR for the development of climate risk insurance products by governments, humanitarian organizations, small- and medium-sized businesses as well as for private households in developing and emerging markets.	Support for MSME insurance (Product development)
InsuResilience Investment Fund (IIF) Funded by KfW on behalf of BMZ (Germany)	Contribute to the adaptation to climate change by improving access to and the use of insurance in developing countries. The specific objective of the fund is to reduce the vulnerability of micro, small and medium enterprises (MSME) as well as low-income households to extreme weather events	Equity and debt financing, including Investment in insurers and brokers actively building the market for climate insurance; and lending to financial institutions and aggregators in return for participation in the development and	Support for MSME insurance (Risk capital)

Managed by BlueOrchard Finance		distribution of climate insurance	
Natural Disaster Fund (NDF) Funded by DFID (United Kingdom) Managed by Global Parametrics	Crowd in a market by working with reinsurers and others to bring in the most cost-efficient risk capital to the insurance market through the NDF	Financing and structuring options, including structuring of solutions, including but not limited to derivatives to create "insurance-like products", and structuring and co-financing to build balance sheets for clients such as MSMEs	Support for MSME insurance (product development and risk capital)
Asia-Pacific Climate Finance Fund (ACLIFF) Multi-donor trust fund Managed by ADB	Support the development and implementation of financial risk management (FRM) products that can help unlock capital for climate investments and improve resilience to the impact of climate change. This includes FRM products to scale up the adoption of climate technologies, FRM products to mobilize new sources of private sector climate financing, FRM products to support investment in climate-sensitive sectors, and FRM products for extreme weather events	Support the development of Financial Risk Management products via technical assistance (incl. Identification, assessment, preparation, capacity-building, knowledge sharing, and research and policy advice to support the development and implementation of financial risk management products); Investment grants for e.g. risk transfer solutions	Support for MSME insurance (Product development), Support for data and integrated risk management needs, and Support for other risk financing solutions
Climate Risk and Early Warning Systems (CREWS) Initiative Funded by several donors	Supports Least Developed Countries (LDCs) and Small Island Developing States (SIDS) to significantly increase the capacity to generate and communicate effective, impact-based, multi-hazard, gender-informed early warnings to protect lives, livelihoods, and assets	Grant financing for activities such as warning systems for rapid-onset events like river and flash flooding, ensuring optimal use of the national meteorological and hydrological service capabilities to protect against severe weather,	Support for data and integrated risk management needs

Trust fund hosted by the World Bank		and strengthening forecast capabilities.	
Global Environment Facility (GEF)'s Small Grants Programme	The GEF aims to help developing countries and economies in transition to contribute to the overall objective of the United Nations Framework Convention on Climate Change (UNFCCC) to both mitigate and adapt to climate change, while enabling sustainable economic development. The GEF is intended to cover the incremental costs of a measure to address climate change relative to a business-as-usual base line	Grant and non-grant instruments	n/a
Green Climate Fund (GCF)	Drive transformative change towards resilient and low-carbon economies. Small portfolio of projects related to insurance Private Sector Facility: To fully engage private sector investors, developers, entrepreneurs, corporations, and small and medium sized enterprises (SMEs) in climate-sensitive and resilient projects.	Grant and non-grant instruments	n/a
Global Index Insurance Facility	Facilitates access to finance for smallholder farmers, micro-entrepreneurs, and microfinance institutions through the provisions of catastrophic risk transfer solutions and index-	Grants and non-grant instruments	Support for MSME insurance, (including both, product development and enhancing insurance and re-insurance risk capital), Support for

Funded by several donors Managed by the IFC	based insurance in developing countries.		data and integrated risk management needs
AGRI Guarantee Facility	Aims to facilitate greater access to finance to Farmers, Agricultural holdings, Cooperative, Rural micro- or small enterprise, Forestry business	Guarantee	Support for other risk financing solutions
Global SME Facility Funded by several donors Managed by IFC	Blended-finance partnership focused on helping to close the financing gap faced by SMEs in emerging markets. Catalyzing access to finance for SMEs, the facility has a goal of generating one million new jobs in the SME sector. The facility dedicates its efforts toward the most underserved SME segments, such as SMEs in fragile countries, very small enterprises, and women-owned SMEs.	Blended instruments	Support for other risk financing solutions
Global Risk Financing Facility (GRiF) Multi-donor trust fund Managed by World Bank	The initial scope is to cover climate and disaster shocks, and over time, will be broadened to other crises pending interest from partners.It would also explore new financial structures, for example linking risk financing directly to scalable safety net systems, disaster preparedness plans, or to financing for resilient infrastructure.	Provides grants to test, pilot, and scale up financing instruments that help developing countries better manage financial impacts from shocks and crises. This includes but is not limited to market-based solutions like insurance. Support for contingent financing, risk financing investments and technical assistance is also provided.	Support for other risk financing solutions

V20 COUNTRIES, G20 PARTNERS AND GLOBAL INITIATIVES:

In order to adequately resource the implementation of the ambitious objectives of the SIF, donor support for both, general technical assistance as well as financing for direct and indirect premium support is needed. The G20 have long-standing political commitments to financial inclusion within developing countries and to support and scale up demand-driven CDRFI initiatives. Based on these commitments, funding and financing in support of implementing the SIF objectives can be provided. The V20 as a Group and as individual countries can drive ambitious and sustainable responses to the financial impacts of climate change. This may also include joint premium support arrangements, which equitably share the burden between V20 and G20 countries. Through being strongly engagement with both components of the ecosystem - the implementation side (see Part I) and the main supporting actors (e.g. the coordination structure and the regional MDBs), the V20 finance ministries can be sufficiently capacitated to ensure that activities and support are demand-driven every step of the way. International partnership and advocacy initiatives, such as the InsuResilience Global Partnership and the Global Partnership for Financial Inclusion (GFPI) should use their platform to increase the visibility of the importance of MSME-responsive insurance, thereby supporting vulnerable countries in raising the funds and resources needed. Transnational initiatives such as the UNEP FI Principles for Sustainable Insurance (PSI) Initiative can continue to advocate for demand-driven and country-owned MSME insurance among their membership.

ASSESSMENT OF SUPPORT STRUCTURE: IDENTIFIED KEY ACTORS

In context of supporting the development of MSMEs, the following actors may be considered as main avenue of support: The ISF, the IIF, the NDF and ACLIFF. Other dedicated financing vehicles may over time also provide additional avenues for financial and technical support. Technical assistance initiatives and Research platforms found less consideration, not because of lower importance, but because these actors can be added more flexibly than the financing vehicles. The financing vehicles should build the core of any systematic approach that works with other (implementing) partners towards the development of climate-smart MSME insurance.

More specifically,

- **ADB may**: Focus on providing the necessary financial and technical support for building distribution channels, policy- and regulatory capacities as well as for enhancing MSME demand through selecting, sub-contracting and coordinating further implementing partners, such as

local universities, NGOs, other technical assistance providers and business associations, which strengthen MSME demand, including in the areas of data needs, climate and financial literacy, and the implementation of complementary risk reduction activities and investments made by MSMEs.

- **ISF may**: Provide insurers with financial support for product development.
- **IIF may**: Provide the same insurer with debt or equity investments to increase its risk capital.
- **NDF may**: Provide financial support to re-insurers to facilitate the development of re-insurance products that correspond to the needs of insurers underwriting the climate-related risks of MSMEs, and thereby indirectly increase the underwriting capacity of the re-insurer

X. ASSESSING THE V20 NEEDS AND SUPPORT LANDSCAPE: CONCLUSION

The here presented High-Level V20 Needs and Support Assessment was prepared mainly for two reasons: First, to understand, underline and validate the objectives of the Sustainable Insurance Facility; and secondly to assess currently existing needs and the support landscape available to address them. Regarding the latter, the assessment also provides the basis for the Draft SIF Operationalization Framework, which integrates the here presented findings into a proposal for a systematic approach to addressing the barriers identified through a selected set of key actors. The Operationalization Framework should therefore be considered as the final result of this assessment.

For a Summary of the SIF Operationalization Framework, please scan:

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Or visit here:
http://www.climate-insurance.org/index.php?id=324

For further information and engagement, please contact:

Sara Jane Ahmed: sara.ahmed@v-20.org

Viktoria Seifert: seifert@ehs.unu.edu

For engagement, you may also contact:

Soenke Kreft: kreft@ehs.unu.edu

Butch Bacani: butch.bacani@un.org