REPORT

Global Risk Modelling Alliance

GRMA Programme in Pakistan
Inception Report

January 2023

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List of Acronyms

ADB	Asian Development Bank
BISP	Benazir Income Support Program
BMZ	Federal Ministry of Economic Cooperation and Development
CAREC	Central Asia Regional Economic Cooperation
CDRFI	Climate and Disaster Risk Finance and Insurance
CDRM	Climate and disaster risk management
CRA	Climate Risk Assessment
DDMA	District Disaster Management Authority
DRM	Disaster Risk Management
DRR	Disaster risk reduction
ERRA	Earthquake Reconstruction and Rehabilitation Authority
GIS	Geographic Information System
GIZ SAR	Strengthening Climate Adaptation and Resilience (SAR) project, implemented by German Agency for International Cooperation (GIZ)
GRMA	Global Risk Modelling Alliance Programme
GS	Global Shield against Climate Risk
HKH	Hindu Kush-Himalaya
ICAREC	Central Asia Regional Economic Cooperation
IDF	Insurance Development Forum
ISF	InsuResilience Solutions Fund
MoCC	Ministry of Climate Change
MoPDSI	Ministry of Planning, Development and Special Initiatives
MVHRA	Multi Hazard Vulnerability and Risk Assessments
NARC	National Agriculture Research Centre
NCCP	National Climate Change Policy
NDC	Nationally Determined Contributions
NDM	National Disaster Management
NDMA	National Disaster Management Authority
NDMP	National Disaster Management Plan
NDRMF	National Disaster Risk Management Fund
NDRRP	National Disaster Risk Reduction Policy
NGO	Non-Governmental Organisation
NUST	National University of Science and Technology
PCRWR	Pakistan Council of Research in Water Resources
PDMA	Provincial Disaster Management Authority
PMD	Pakistan Meteorological Department
TA	Technical Assistance
UNDP	United Nations Development Program
V20	The Vulnerable Twenty Group of Ministers of Finance of the Climate Vulnerable Forum
WASH	Water, Sanitation and Hygiene
WBG	World Bank Group

1. Context

This inception report describes the origin of GRMA support to Pakistan, outlines the activities and outcomes of the inception workshop and details the agreed scope and timeline for implementing the GRMA programme in Pakistan.

1.1 The Global Risk Modelling Alliance

The Global Risk Modelling Alliance (GRMA) results from a strategic agreement between the V20 Group of Ministers of Finance and the cross-sector Insurance Development Forum (IDF). Its purpose is to strengthen climate and disaster risk insight, support strategic decision-making and help unlock risk finance for public good. Working side by side with officials and local experts in ministries and their agencies, it offers open risk management tools, technical assistance (TA) and funding for open models and data. Funded by the German government and supported by the international insurance industry, the GRMA offers countries open data, technology, and practical learning through co-development of risk management strategies and applied risk finance projects. It aims to strengthen local capacities in risk understanding and support the establishment of open-source risk modelling platforms. The GRMA programme is a significant contribution to the Vision 2025 of the InsuResilience Global Partnership, which aims to catalyse financial protection for 500 million vulnerable people by 2025.

The GRMA is a public-private technical assistance programme to address persistent challenges of risk understanding in the most climate vulnerable countries. The GRMA programme will assist countries in building, sharing, and developing local capability in climate and disaster risk understanding, using open modelling principles and private sector knowledge to increase access to risk finance. The GRMA programme comprises three key elements:

1. An open-source risk modelling platform and open data standards to promote accessibility, choice, and sharing across departments and sectors.
2. A model and data component providing a funded mechanism to fill critical gaps with data and models produced as digital public goods, with a particular emphasis on co-developing these with local knowledge and information.
3. The GRMA technical assistance team, which provides human interaction and connects private sector experience to development needs.

Furthermore, the GRMA has been selected as a key resource for the Global Shield (GS) Initiative, particularly during initial in-country climate risk assessments and subsequent capacity building. The GS, launched at COP27, is an initiative launched by the G7 in partnership with the Vulnerable Twenty Group (V20) of Finance Ministers for pre-arranged financial support designed to be deployed during climate disasters. It aims to increase protection for poor and vulnerable people by substantially enhancing pre-arranged finance, insurance and social protection mechanisms against disasters which will help to cost-efficiently and effectively minimise and address losses

and damages exacerbated by climate change. Pakistan is one of seven selected GS pathfinder countries. Through the GRMA programme, Pakistan therefore has the opportunity to initiate the GS in-country dialogue and define areas of required public and private sector support in the area of climate and disaster risk financing.

The GRMA is also an integral component of V-20 Climate Prosperity Plans, now being rolled out in a number of Climate Vulnerable Forum (CVF) member states. Pakistan has declared its intention of joining the CVF/V-20 and can therefore expect the GRMA to be relevant in that context.

1.2 Pakistan MoCC Request for GRMA support

Pakistan was the first country to request support from GRMA after its launch in June 2022, and support was formally requested via application to the GRMA on 14 October 2022, by the Ministry of Climate Change – making Pakistan the first country to join the programme. Support is requested to understand the risk of drought, heat, landslides, flood and earthquakes on agriculture, construction, disaster relief/fiscal budget, education (physical assets: schools, universities), healthcare (physical assets: hospitals), public infrastructure including roads, and population.

The GRMA intends and was requested to build technical competency in conducting risk assessments, and capacity building on climate risk management and metrics for operational risk finance. Consequently, information should be made easily available to all sub-national and national level development planners and the private sector to mainstream the implementation of climate risk adaptation, risk reduction, and risk financing strategy and specific projects in all sectoral development. GRMA would enable relevant stakeholders to apply and further develop risk models and tools and gain autonomy in risk analysis. The programme will strengthen long term local capacities in risk understanding with co-development of country risk strategies in disaster risk reduction (DRR), adaptation and Climate and Disaster Risk Finance and Insurance (CDRFI).

The objectives of the program will be to:

1. Strengthen long-term local capacities in climate and disaster risk understanding.
2. Co-develop clear (sub-) country risk priorities for application to DRR, adaptation and CDRFI, as well as (sub-) national climate and disaster risk management strategies.
3. Strengthen capacity in climate risk modelling techniques and data acquisition to enable sustainable access to open risk modelling data and tools through practical experience.
4. Joint development of two operational level risk assessment projects with a view to stimulating resilient investment or risk transfer instruments.

1.3 Pakistan MoCC Request for GRMA support

Characterized by climatic and topographic diversity, all provinces and regions in Pakistan are facing a range of disaster and climate change threats. The Earthquake Reconstruction and Rehabilitation Authority (ERRA) was established in 2005 as a central coordinating body to assume

the responsibility over earthquake recovery and post-earthquake development work inclusive of disaster risk reduction considerations. In 2010 the National Disaster Management (NDM) Act 2010 was passed to set up institutional arrangements for Disaster Risk Management (DRM) in Pakistan with decentralized responsibility under the three-tier governance level: federal, provincial and district level, with authorized DRM bodies: the National Disaster Management Authority (NDMA), Provincial Disaster Management Authorities (PDMAs) and District Disaster Management Authorities (DDMAs).

Recognising the importance of risk knowledge for successful implementation of risk reduction measures, Pakistan's national policy documents i.e., National Climate Change Policy (NCCP 2021), Pakistan Updated Nationally Determined Contributions (NDC, 2021) and National Disaster Reduction Policy (NDRRP, 2013) all mention risk assessment as one of the priority areas that needs immediate attention. The NDRRP-2013 climate risk assessment is mentioned as an important policy instrument seen as essential basis for developing a risk or vulnerability atlas and index at national level and conducting local/district level risk assessment. In 2022 the first Multi Hazard Vulnerability and Risk Assessments (MHVRAs) for the entire country were conducted and recommended to now focus on micro-level risk assessment down to the lowest administrative level.

The National Disaster Management Authority (NDMA) published policy guidelines for conducting MHVRAs (2016). The guidelines are based on an in-depth review of all dimensions of risk to include:

1. Hazard location, intensity, frequency/probability, etc.,
2. Analysis of the physical, social, economic and environmental dimensions of vulnerability and exposure, and
3. Coping capacities, which make people and communities resilient against the adverse effects of disasters.

Local expertise in climate and disaster risk analysis are needed for the country to fully implement the National Disaster Management Plan (NDMP) and to address specific problems and needs of each locality. This includes building technical competency in conducting risk assessments and capacity building on climate risk management among sectoral planners, local planning authorities, town planners, and data and statistics management agencies – especially at provincial and district level. The NCCP-2021 recommends developing and enforcing rules for making climate change assessments (CRAs) mandatory for all development projects' approval, where federal funding is involved. It further recommends conducting comprehensive climate risk and vulnerability assessment at district level. The framework for NCCP implementation until 2030 provides further strategic guidance to integrate adaptation actions and mitigation measures.

Pakistan's NDC (2021) describes plans to conduct climate proofing risk assessment for new public/private sector finance projects by 2024, as well as to develop climate risk insurance products for marginalized communities. Consequently, information should be made easily available to all sub-national level development planners and the private sector to mainstream the implementation of climate risk adaptation and risk reduction projects in all sectoral development.

However, lack of technical capacity and resources are limiting the collection, analysis, and management of disaster information at the lower levels of government.

In addition, Pakistan is party to several international agreements on climate and disaster risk reduction, including the Paris Climate Accord and the Sendai Framework for Disaster Risk Reduction (building on the Hyogo Framework for Action). In 2021, Pakistan also signed a bilateral Climate Partnership Pact with the German government to boost cooperation in the field of climate change. Specifically, Pakistan has signalled its commitment to scale up initiatives related to – among others – nature-based solutions, to be supported in part by technical and financial contributions from the German government. One area of support is through the Strengthening Climate Adaptation and Resilience (SAR) project, implemented by the German Agency for International Cooperation (GIZ) on behalf of the Federal Ministry of Economic Cooperation and Development (BMZ), with Pakistan's Ministry of Climate Change (MoCC) acting as Lead Executing Agency.

2. Inception Workshop, Islamabad, December 2022

The requested GRMA support is holistic and thus does not give strong prioritization to any hazard or exposure – although the GRMA support must include climate risks. In light of the current gaps in risk modelling and data, the GRMA suggests that Pakistan can benefit from the technical assistance, data acquisition and modelling support offer within the program. An inception workshop was organised to define the scope of the work jointly with key officials and subject matter experts in Pakistan. The workshop was attended by 60 participants from government, development sector partners, civil society, academia, NGOs, and private sector representatives (see Annex 1 for participant list). The invitation letter, workshop concept note and photographs from the workshop are provided in Annexes 2-4.

The goals of this workshop were:

1. That key stakeholders in Pakistan will gain understanding of the scope of the request for support, the GRMA program and proposed project. Those stakeholders will have the opportunity to contribute to defining the GRMA project through their existing and aligned activities.
2. That the GRMA team will gain an improved understanding of existing risk information, technical capacity, and analytical activities in Pakistan. This will support co-development of the project plan, including identifying the roles of project partners.
3. To agree the project scope including a draft roadmap for the GRMA programme in Pakistan. This will be co-developed with key stakeholders to meet the stated needs of the request for GRMA support and maximising input from existing and aligned activities.

Through interaction with the stakeholders in the workshop and bilateral meetings, we identified the key sectors and hazards to include in the GRMA project scope that would be crucial for building resilience against climate-related damages in Pakistan. We worked on identifying technical needs and suitable tools, framework/roadmap for GRMA activities in the country, and needs of the local and national stakeholders/ experts. We also identified the existing programs in the country and established an approach to find synergies in order to leverage existing research and earlier work.

Around the workshop, bilateral meetings were held with Pakistan Meteorological Department (PMD), National University of Science and Technology (NUST), Pakistan Council of Research in Water Resources (PCRWR), National Agriculture Research Centre (NARC), National Health Services Academy, Ministry of Economic Affairs, Ministry of Finance, National Disaster Management Authority (NDMA) and Ministry of Climate Change (MOCC). See Annex 5 for notes from bilateral meetings.

3. Outcomes of the inception workshop

During the inception workshop, the following country needs were identified:

1. Good quality and more granular risk data to help with targeted disaster risk response and planning of appropriate prevention measures,
2. Development of locally adjusted models for requested hazards,
3. Assistance to better understand projected climate impacts and possible benefits of adaptation and risk-transfer solutions to guide, incentivize, and accelerate public and private sector investments for a climate-resilient transformation, and
4. Technical capacities for conducting quantitative climate risk analyses with open-source models.

3.1. Insights from participant discussions

Workshop discussions demonstrated that in Pakistan **there is a lack of modelling infrastructure to conduct in-depth analysis of the hazards identified during the workshop.** The limited number of studies highlighted by stakeholders have been conducted by external consultants and largely based on proprietary models. Therefore, limited knowledge and expertise has been transferred to local stakeholders.

Annex 6 contains the discussion questions and responses captured during group discussions, and the key common points include:

1. **Capacity building for climate risk analysis is of highest concern with limited in country expertise in modelling and analysis** leading to very few climate risk analyses available using state of the art risk modelling techniques and lack of national overview.
2. **There is a very strong request for capacity building in all sectors** (ministries, academia, governmental agencies) from national to provincial level. There is need for improvement

in capacities of technical know-how and implementation to identify, quantify, and mediate a solution to climate vulnerabilities.

3. **Prioritization of hazards is difficult because priorities vary across the country**. The wide spectrum of risks and strong regional differences render ranking on the national level difficult.
4. **Compound risks due to additional non-climate related risks** (e.g., air and water pollution) and slow onset (saltwater intrusion) were identified to be significant as well.
5. **Knowledge and expertise on adaptation and risk financing is not widely shared and implemented.**
6. **A lack of centralised data and modelling facilities** suitable for simulating complex climate impacts hinders climate mitigation and adaptation planning.

The workshop discussion helped to confirm which hazards are most prominent in terms of impacting the majority of sectors:

1. Flood
2. Heat stress to human and agriculture systems
3. Drought (especially agricultural drought)
4. Glacial Lake Outburst Floods
5. Saltwater Intrusion
2. Water pollution
3. Landslide (mainly in the northern regions)
4. Earthquake

The identified hazards impact society in different ways, ranging from damage to public infrastructure and facilities (schools, hospitals, roads) impacts on disaster relief budgets, and mortality of vulnerable people. Agricultural impacts are varied, and include loss of agricultural productivity and the ability to sustain agriculture (especially in southern parts with saltwater intrusion rendering the land unsuitable for agriculture) along with loss of income from cash crops, and loss of labour productivity due to heat-related discomfort.

The workshop discussions also helped to identify the technical needs, available suitable tools, and roadmap for GRMA activities. The few studies that are mainly conducted by academics and researchers have not successfully been shared and implemented in other sectors and by government due to a lack of connection with other local researchers and political decision-makers. Therefore, these studies have had limited impact on the management of climate and disasters.

Deficiencies in the area of climate risk modelling and data as identified by local and national experts include:

1. There are a limited number of MHVRA analyses (twelve in number and eight more planned) conducted at the district level. Risk analyses at lower resolution (e.g., national level) are not adequate for local adaptation planning or structuring local risk transfer mechanisms.
2. There is a lack of digitization and decentralized responsibilities in the area of climate and disaster risk management (CDRM) leading to irregular, non-standardised data. PDMAs have access to lot of data but lack the capacity to make it accessible.
3. Data in northern disputed provinces is politically sensitive and inaccessible.

4. Coordination between ministries seems a barrier and the responsibilities of various parties are, at times, ambiguous.
5. Almost no reference is made to the resources that the private sector (global or local) could potentially bring to risk understanding through public-private collaboration.
6. There is generally a need for a more enabling policy environment.

On the policy level, the NDC 2021 elaborates plans to develop climate risk insurance products for marginalized communities. While some pilots have been implemented, clear evidence is lacking on the potential impact of these products to resilience levels.

3.2 Further insights to be gained

The workshop was successful in mapping resources at various levels in the country however due to lack of time and resources we were not able to engage all the stakeholders and partners that we would have wished to. Some of the limitations to our understanding of risk insight and financing in the country could be attributed to:

1. During the first workshop we were unable to establish significant connections at a policy level with the Ministry of Finance or the Ministry of Planning. However, we do acknowledge their centrality to the success of a sovereign risk finance strategy and we plan to work on this in the early stages of the program.
2. Deficiency in full knowledge and understanding of the engagements existing within the country before the workshop and thus lack of mapping the resources existing the country e.g.the engagement between Ministry of Economic Affairs and CAREC project.
3. Absence of our knowledge on the role and understanding of the risk assessment and financing at the provincial level. The workshop eventually focused on national level stakeholders and could not engage much on the provincial level and this is something the team would work on.
4. Lack of connections with the private sector and regulators in country and understanding of their interests in physical climate risk. We have since established contact with the regulator (the Insurance Division of the Securities and Exchange Commission of Pakistan), and plan to build connections with the domestic insurance sector, which is largely based in Karachi.

3.3 Ongoing CRA and CDRFI activities in Pakistan

The workshop provided an opportunity to take stock of the ongoing or planned climate risk assessment (CRA) and CDRFI activities of various development partners active in Pakistan. This stocktake is particularly critical in the context of the Global Shield, which aims to address and improve the fragmented state of the current global CDRFI architecture. Under this umbrella, the GRMA aims to ensure that there is synergy between complementary activities and avoid duplication of work. Key partners, in addition to private sector stakeholders, were invited to attend and exchange on this topic on Day 2 of the workshop. Highlights from this discussion are presented below and are used to identify the added value provided by GRMA support.

The World Bank Group (WBG) Country Partnership Framework (CPF) with Pakistan (2017–2020) established a Glacier Monitoring and Research Center for the Hindu Kush-Himalaya (KHK) region

as data on most glaciers is lacking. Furthermore, the framework identified the need to support the creation of multi-hazard early warning systems going down to the community levels to better warn the vulnerable communities for improved preparedness. The WBG process to prepare a new CPF for Pakistan for the period 2022-2026 is currently ongoing. GRMA support on data and risk modelling would complement WBG engagement in Pakistan, working on different sectors and at the same time providing risk analysis for risk management on the community level.

A 2022 Asian Development Bank (ADB) study estimated the potential impacts of compounding risk between natural hazards and infectious disease outbreaks in the Central Asia Regional Economic Cooperation (CAREC) region including Pakistan. This also included the development of a climate risk assessment tool (CAREC Disaster Risk Modelling Interface) based on global flood and earthquake hazard models. Since this work is open-source, GRMA will be able to complement and further elaborate ADB´s work specifically for analysis on the lower admin level. Furthermore, ADB is backing the National Disaster Risk Management Fund (NDRMF), through technical assistance for quantitative risk analysis (catastrophe, or NatCat modelling) and recapitalization to help implement national plans to reduce disaster risks and enhance preparedness. GRMA risk analysis will further be able to inform NDRMF to refine and implement respective plans. Finally, ADB is also engaged in complementary activities to enhance the financial and policy-level capabilities of key climate and disaster risk management institutions such as Disaster Management Committees (DMC) to stimulate, develop and implement financially sustainable as well as scalable CDRFI strategies and solutions. These range from sub-sovereign and agriculture insurance to Cat Bonds, among others. The GRMA program can revisit these activities in the latter part of its implementation when risk modelling results are used to identify appropriate financing solutions. It is also worth mentioning that ADB is deeply engaged and planning to strengthen its disaster risk reduction (DRR)/adaptation project pipeline in Khyber Pakhtunkhwa (KP) and Punjab, the same provinces that are also the focus of the GIZ SAR project.

The GIZ SAR project (2021-2025) seeks to improve the prerequisites for climate change adaptation and risk management in KP and Punjab provinces and on a national level through two channels, namely developing target-group-specific climate risk management information and strengthening the enabling environment (planning and financing capabilities and access to international climate finance) for resilience. Sector-specific Climate Risk Assessments are being conducted using CLIMADA, for agriculture, health and Water, Sanitation and Hygiene (WASH), in close collaboration with the ISF. Another area for synergy with the GRMA, which aims to implement a Training-of-Trainers program, is the development of training and awareness raising campaigns targeting relevant institutions such as schools, universities, extension services and NGOs, using specific learning formats. The SAR project already supports the improvement of provincial climate risk assessment tools and the GRMA team can draw both lessons learned and relevant knowledge products from this effort.

In Pakistan, UNDP focuses on disaster risk financing, run largely through partnerships such as the Tripartite Agreement (with the IDF and German Government, financed in part through the ISF), partnerships with IDF industry partners (among others, Swiss Re and Allianz), and with governmental and local partners. Through its NDC implementation plan, UNDP also undertakes provincial and national level consultations, develops proposals and investment plans, and makes implementaton and service delivery arrangements. A recently published draft diagnostic study on

Inclusive Insurance and Risk Finance examines supply and demand issues as legislative and regulatory gaps for DRR in Pakistan and features a case study on drought in Balochistan, which identifies potential opportunities for aligning CDRFI instruments with government interventions.

While KfW Development Bank is also focused on climate adaptation investments (flood resilience – together with GIZ), the main area of interest for the GRMA is its work on adaptive social protection for poor and vulnerable households against climate related shocks, and its linkages to the Benazir Income Support Programme (BISP). The GRMA team has concrete plans to liaise with KfW representatives in Islamabad to discuss these synergies.

The START Network operates a multi-hazard disaster risk financing system in Pakistan, covering heatwaves (with internally built trigger models covering six cities including Karachi), floods (using parametric models built by JBA covering only the Indus basin) and drought (for which the University of Reading is currently building a model for Sindh and Punjab). Technical working groups are established for each of the hazards, which work with specific local and national NGOs on the ground to distribute funds when required.

The details of existing and planned climate and disaster risk research, models, and data are outlined in Annex 7 along with the data matrix that helped define the scope of activities.

	Target sectors and provinces	CRA activities	CDRFI activities	Key documents	GRMA synergies
WBG	• Energy, water, agriculture	• Establishment of Glacier Monitoring and Research Center for the Hindu Kush-Himalaya (KHK) to enhance currently lacking regional data on glaciers	-	• Country Partnership Framework with Pakistan (2017–2020) • World Bank CCDR for Pakistan	• Complement WBG risk analytics work on community level by focusing on district and provincial levels
ADB	• Health • KP and Punjab	• Development of a climate risk assessment tool (CAREC Disaster Risk Modeling Interface) • TA for quantitative risk analysis (NatCat modelling)	• Backing NDRMF • Recapitalization support to implement national DRR plans • Capacity building to develop/ implement sustainable & scalable DRF solutions	• Country Risk Profile Pakistan (CAREC project) • Railway Sector Assessment Pakistan	• Complement analysis at lower admin level
GIZ	• Agriculture, health and WASH • KP and Punjab	• Ongoing sector-specific CRAs using CLIMADA	• Strengthening enabling environment to access international climate finance		• Collaboration on trainings and awareness campaigns
KfW		• Climate adaptation investments (flood resilience	• Adaptive social protection		• Linkages to the Benazir Income Support Programme (BISP) • Leveraging synergies with other KfW portfolio
STARTNetwork	• Karachi, Indus Basin, Sindh, Punjab	• Technical working groups established for flood, heatwaves, and drought,	• Operates a anticipatory multi-hazard disaster risk financing system	Start Ready Pakistan documents here	• Leverage close working relationships of TWG and local/national NGOs
UNDP	• Balochistan	• CRA with drought focus • NDC implementation support	• Development of concept and capacities to disaster & risk financing through key partnerships	• Diagnostic study on Inclusive Insurance and Risk Finance	• Building existing partnerships and consultations

Table 1: Ongoing and planned CRA and CDRFI activities in Pakistan

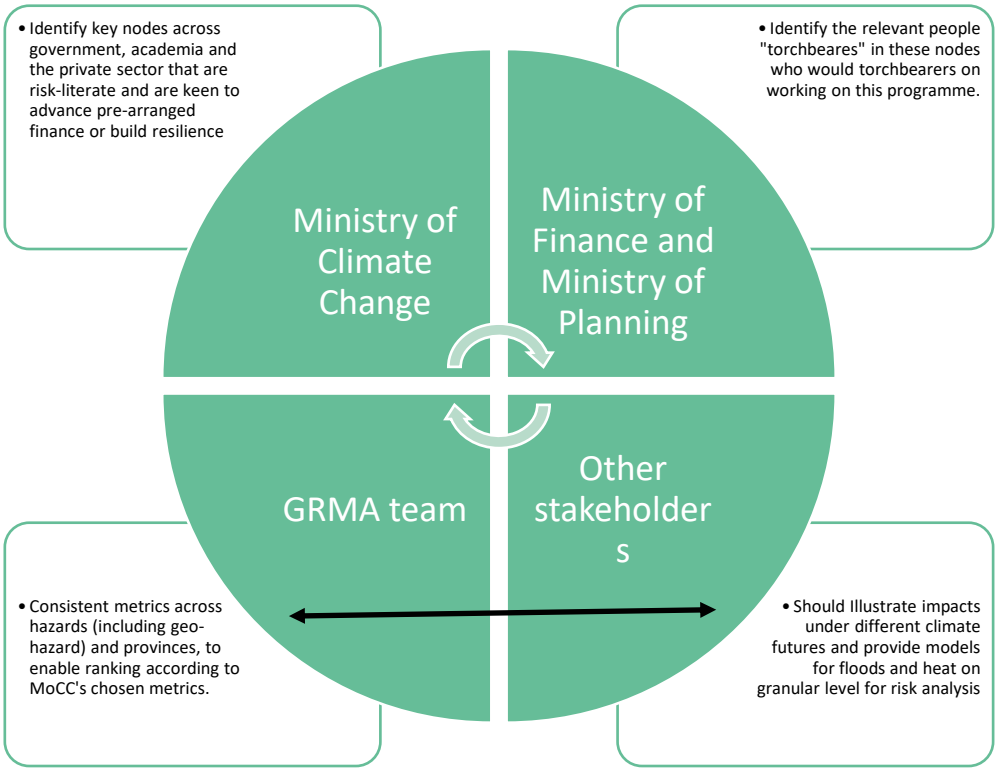
4. Proposed GRMA activities

4.1 Scope of support and stakeholder roles

GRMA support will help to embed the work of MoCC in collaboration with the GIZ SAR project in a strategic international policy framework towards more climate resilience and help to access new public and private funding for adaptation and disaster risk management. Through the involvement of the private sector, GRMA could further catalyse collaboration on climate and disaster risk finance and insurance with both the international and domestic insurance industry. Through GRMA support, certain challenges around the technical design of such instruments may be overcome (especially through model development). In the later part of the report, we have identified two operational projects that we would like to focus on along with increased access to models of those said hazards. The choice of hazards (flood and heat waves) echoes the sentiments and needs that were captured through our workshop and visits which then translates into the impact assessment we would carry on the most vulnerable sectors of society (Income support for poor and vulnerable people and communities and agricultural productivity loss). We eventually would, with help of climate risk assessments, identify adaptation measures that could be used to lower the risk to climate hazard and would demonstrate cost-benefit of increasing access to adaptation measures (including physical adaptation and CDRFI) in face of disaster.

Capacity development will be conducted by means of a “train the trainers” approach and these trainers will be enabled to access valuable data and models co-developed in the GRMA project with local experts. The collaboration between GRMA and local stakeholders is shown in the schematic in Figure 1.

Figure 1: Stakeholder involvement in GRMA process and setting up the operational projects



The GRMA team would now agree with Ministry of Finance, Ministry of Planning and MoCC what deliverables they would like to see in broadly under GRMA, such as:

1. The impact metrics of most value for decision-makers, e.g., economic loss; food security; loss of livelihoods/welfare impacts; and mortality.
2. The policy instruments that would be used to convey the information, e.g., National Adaptation Plan.
3. Where (regions, hazards, and exposures) data and model support should be focussed and what hosting arrangements might be possible.
4. How GRMA could be most beneficial in engaging in the taking the risk assessment and adaptation conversation.
5. Identify and agree of the scope and extent of conducting a multi-hazard climate risk assessment.
6. Identify the stakeholders that should be the beneficiaries of the "train the trainers" initiative so that the research and resources originating from the programme could be used most sustainably.

4.2 Proposed operational projects

Two operational projects are proposed, through which the GRMA and collaborating stakeholders will:

1. Develop ownership for roles, key dependencies, and formulation of research questions, resource catalogues, milestones to be achieved within the projects.
2. Maximise the opportunity for 'side by side' learning in these projects, for ministry or provincial officials performing the analysis alongside GRMA team members.
3. Establish credible climate risk models, granular datasets, and knowledge platform that would enable the stakeholders to conduct subsequent CRAs and to become more self-reliant in risk understanding for disaster risk finance and investment in adaptation.
4. Embed and document best practices and standards in procurement of models and data for shared use on open risk modelling platforms, using interoperable data standards.

In partnership with NDMA/NDMRF we would like to work on social protection scheme BISP from floods and agro-insurance in affected district from heat leading to climate risk analysis. The agro insurance product would entail baseline risk modelling and potential trigger design for a parametric scheme from heat related losses whereas social protection scheme would analyse the macro-economic aspects of flood disaster and increase in vulnerabilities to the communities.

The very tangible outcomes for Pakistan from this exercise would involve access and knowledge to the flood and heat models on district scale, exemplary implementation of the risk assessment in two districts facing such disaster, and know-how of the mechanisms through capacity building. Consultations will be held with the provinces concerned before confirming the projects. The timeline and tasks for the two operational projects along with the GRMA programme in the country in outlined in the Gantt chart included in Annex 8.

On agreement of the proposed GRMA activities GRMA would establish hazard models nationally for the prioritized hazards (floods and extreme heat), with the research community in the country and the private sector internationally. The models will be used to perform quantitative risk assessment on the provincial level (in one each of the identified province in the region) for the

identified hazard and exposure with objective to help technical experts in Pakistan to use and apply the tools to assess and prioritise adaptation investments to reduce risk, and to engage in work to structure potential CDRFI solutions to provide funding for residual climate-related damages.

4.2.1 Operational project 1: Benazir Income Support Program (BISP)

This project would investigate the increased vulnerabilities of people and communities due to recurring floods and the effects of this on the financing needs of BISP. The project would focus on modelling and assessing current and future climate risk and vulnerabilities of flood (hazard) on population nationwide. With knowledge of the structure and implementation of BISP in the region, the analysis will demonstrate how climate change will affect how floods would impact the programme operation and sustainability. I.e., could increased flood risk in a future climate lead to an increase in social vulnerabilities of the people, and as a result greater exposure of people to loss of income and livelihood and a need for increased funds under BISP. The GRMA would appraise various adaptation solutions (physical and CDRFI) using cost-benefit analysis in one of the disctricts with high BISP load to evaluate the benefits of adaptation measures.

4.2.2 Operational project 2: Extreme heat effects on agricultural systems

This project would investigate vulnerabilities in agricultural systems and productivity loss due to extreme heat. The project would focus on modelling and assessing the risk of crop loss and crop productivity due to sustained exposure heat (hazard) in a district (to be decided) in Sindh province. This would be followed with appraising various adaptation solutions and their costs and benefits including baseline modelling and trigger design for a parametric insurance scheme to respond to extreme heat events.

4.3 Recommendations

The next steps include holding a virtual meeting of stakeholders to present the findings of the workshop and the proposals made in this inception report, including discussion on the suggested two operational projects. This would also be an opportunity to identify the stakeholders in Pakistan and formation of an in-country team, with key named positions for leadership and technical contribution for each of tasks outlined in Annex 8. We envision three more workshops as outlined in Annex 8 (August workshop in Frankfurt) before the conclusion of programme for capacity building along with frequent visits by GRMA team and stakeholders (and vice-versa) especially for implementation of operational projects in the country. The team would also engage with the private sector and regulators to draw from their experience in the field. Finally, the GRMA team would secure agreement with ministries on priorities, e.g., through MoU along with establishment of networks at province level to create the right conditions for the operational projects. The program would observe “learning side by side” approach with intention of building strong relationships with the involved stakeholders and eventual beneficiaries of the project.

ANNEXES

Annex 1: Participant list

Annex 2: Invitation letter

Annex 3: Concept Note

Annex 4: Workshop photographs

Annex 5: Notes from bilateral meetings

Annex 6: Workshop group discussion questions

Annex 7: Stocktake of existing models and datasets

Annex 8: Activities and timeline for GRMA