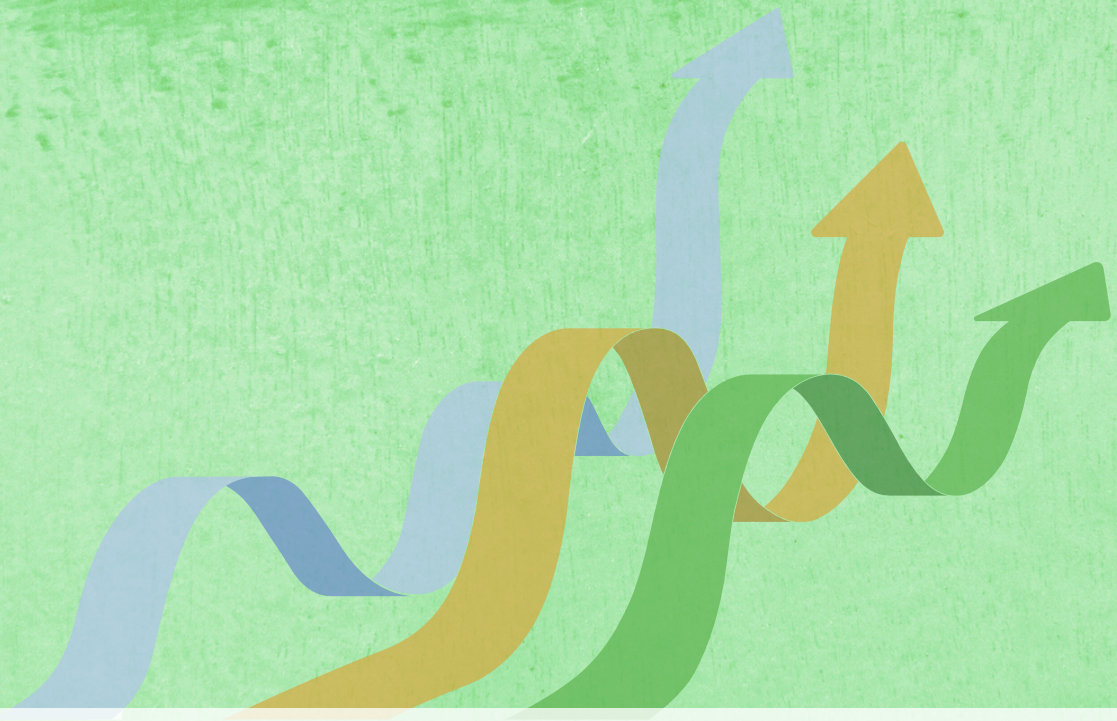
2025

CLIMATE AND NUTRITION INTEGRATION:

EVIDENCE GENERATION, STAKEHOLDER MAPPING, AND POLICY LANDSCAPE ANALYSIS IN PAKISTAN



I-CAN

gain
Global Alliance for Improved Nutrition

Irish Aid
An Roinn Gnóthaí Eachtracha agus Trádála
Department of Foreign Affairs and Trade

ACKNOWLEDGEMENTS

Initiative on Climate Action and Nutrition (I-CAN): The Initiative on Climate Action and Nutrition (I-CAN) is a multistakeholder initiative that aims to advance action to address the critical nexus of climate change and nutrition. Launched by the Government of Egypt, as COP27 President and hosted by WHO, core partners include FAO, GAIN, the SUN Movement, and UNEP.

Global Alliance for Improved Nutrition (GAIN): The Global Alliance for Improved Nutrition (GAIN) is a Swiss based foundation launched at the UN in 2002 to tackle the human suffering caused by malnutrition. Working with governments, businesses and civil society, we aim to transform food systems so that they deliver healthier diets for all ZAkipeople, especially the most vulnerable, from more sustainable food systems.

Zaki Ullah from GLOW Consultants, led the drafting of this report. He brings expertise in development, monitoring and evaluation, quality assurance, and third-party Assessments.

Citation: I-CAN (2025). Climate and Nutrition Integration: Evidence Generation, Stakeholder Mapping, and Policy Landscape Analysis in Pakistan, Global Alliance for Improved Nutrition (GAIN).

Authors:

Zaki Ullah
Faiz Rasool
Hamna Sohail
Dr Umar Farooq
Dr Samreen Fahim Babar
Zainab Jamil
Muhammad Ismail

Contact: Faiz Rasool (GAIN) frasool@gainhealth.org

Acknowledgements

Our thanks are extended to the members of the wider GAIN team, for their time and effort to guide the development of the report including Antony Ogolla, Oliver Camp, Stella Nordhagen, Jamie Morrison, Sharada Keats and Jessica Colston.

We also extend our sincere appreciation to the GAIN Pakistan team for their continued support, with special thanks to Farrah Naz for her guidance and leadership. We further acknowledge the project teams of Whey to Value, Fruit Bars and Social Protection for meaningfully integrating I-CAN into their advocacy, dissemination and engagement activities.

We would also like to extend our gratitude to Irish Aid for their support for I-CAN and the development of this report.

This report was prepared by GAIN and published as a technical contribution to I-CAN. It does not necessarily reflect the views of Irish Aid or constitute an endorsement by each of the I-CAN partners.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AJ&K	Azad Jammu & Kashmir
BCC	Behavior Change Communication
BCCP	Balochistan Climate Change Policy
CSA	Climate-Smart Agriculture
ESRF	Ecosystem Restoration Fund
EWS	Early Warning Systems
FAO	Food and Agriculture Organization
FBDGs	Food-Based Dietary Guidelines
FSIEWS	Food Security Information and Early Warning System
FY	Fiscal Year
GAIN	Global Alliance for Improved Nutrition
GB	Gilgit Baltistan
GB-CCAAP	Gilgit-Baltistan Climate Change Adaptation Action Plan
GB-EPA	Gilgit Baltistan-Environmental Protection Agency
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gases
GLOFs	Glacial Lake Outburst Floods
I-CAN	Initiative on Climate Action and Nutrition
ICT	Islamabad Capital Territory

IPCC	Intergovernmental Panel on Climate Change
IYCF	Infant and Young Child Feeding
K-CAP	Karachi Climate Action Plan
KP	Khyber Pakhtunkhwa
KP-CCAP	Khyber Pakhtunkhwa Climate Change Action Plan
KPIs	Key Performance Indicators
KP-NMD	Khyber Pakhtunkhwa-Newly Merged District
M&E	Monitoring & Evaluation
MoNFSR	Ministry of National Food Security and Research
MoNHSR&C	Ministry of National Health Services Regulation and Coordination
MRV	Measurement, Reporting and Verification
NAP	National Adaptation Plan
NDCs	Nationally Determined Contributions
NDMA	National Disaster Management Authority
NDMP	National Disaster Management Plan
NFS-MC	National Food Systems Monitoring Committee
NGOs	Non-Governmental Organizations
NNPs	National Nutrition Plans
NNS	National Nutrition Survey
NUS	Neglected Underutilized Species
PARC	Pakistan Agricultural Research Council
PASSCO	Pakistan Agricultural Storage and Services Corporation
PCRWR	Pakistan Council of Research in Water Resources

PDGN	**Pakistan Dietary Guideline for Better Nutrition**
PDMA	**Provincial Disaster Management Authority**
PMD	**Pakistan Meteorological Department**
PMNS	**Pakistan Multi-Sectoral Nutrition Strategy**
PSDP	**Public Sector Development Programs**
R&D	**Research and Development**
RCP	**Representative Concentration Pathway**
RDA	**Recommended Daily Allowance**
SBCC	**Social and Behavior Change Communication**
SDGs	**Sustainable Development Goals**
TBTTP	**Ten Billion Tree Tsunami Program**
UNFCCC	**United Nations Framework Convention on Climate Change**
UNFSS	**United Nations Food Systems Summit**
V&A	**Vulnerability Assessment**
WASH	**Water, Sanitation and Hygiene**
WFP	**World Food Programme**

EXECUTIVE SUMMARY

INTRODUCTION

Pakistan faces severe climate change and malnutrition challenges. Recurrent floods, droughts, and rising temperatures threaten crop yields and food security, while malnutrition rates (40.2% child stunting, 17.7% wasting)[1] are among the highest globally. Climate change aggravates these trends (e.g., elevated CO_2 reduces staple crop nutrient density, potentially causing 500,000 additional deaths/year by 2050)[2]. Vulnerable groups (women, children, smallholder farmers) bear the brunt of crop losses and dietary deficits. However, Pakistan's climate and nutrition agendas have been siloed. Due to this disconnect, Pakistan's policies remain fragmented perpetuating systemic vulnerabilities. To tackle this issue, Global Alliance for Improved Nutrition (GAIN) has taken a global, multi-sectoral initiative aiming to foster collaboration at the intersection of climate, nutrition, and health "Initiative on Climate Action and Nutrition (I-CAN)". The initiative focuses on promoting climate-resilient nutrition solutions through integrated, cross-sectoral strategies. The objective of this baseline assessment is to examine the current level of integration between climate and nutrition, in Pakistan country context, across existing policies, strategies etc., and to identify opportunities for improved alignment.

METHODOLOGY

The assessment used GAIN's global I-CAN framework, which is organized around four pillars: Implementation, Action and Support; Capacity, Data and Knowledge Transfer; Policy and Strategy; and Pillar 4 - Investments. Key indicators were defined under each pillar - see Table 1 of the report. Evidence was collected through a mixed-methods approach: a comprehensive desk review of national and provincial climate, agriculture, food security and nutrition policy documents, supplemented by 20 key informant interviews, 8 focus group discussions, and a national stakeholder workshop. This triangulation ensured findings reflect both policy intent and on-the-ground realities.

Integration was scored on a four-level scale (Level 1: no integration, to Level 4: explicit, systematic integration) following the I-CAN global baseline methodology. Policy documents were analyzed via climate-nutrition keyword searches and manual review; AI tools supplemented this to ensure no linkages were missed. Preliminary integration levels from document review were then validated against stakeholder input (KIIs/FGDs/workshop), revealing barriers and examples of practice in Pakistan.

KEY FINDINGS

The key findings of I-CAN baseline assessment are as follows:

Climate Policies and Strategies

Pakistan's national climate strategies generally recognize the climate-nutrition link, but fall short of integrated action. For example, the Updated Nationally Determined Contribution (2021) cites climatedriven nutrient losses and food insecurity, contains no explicit nutrition targets, programs, or budgets (Level 2). By contrast, the 2023 National Adaptation Plan explicitly links climate impacts to malnutrition (noting around 40% of households are food insecure) and prescribes actions in climateresilient agriculture, water security and health (achieving Level 4 integration). Other national policies and strategies acknowledge food security in passing: the National Climate Change Policy (2021) and the Disaster Management Plan (2025) mention crop failures and malnutrition histories, but include no nutrition-specific indicators or inter-sectoral plans (both rated Level 2). In short, across national level, only the NAP demonstrates fully operationalized climate-nutrition linkages, while the NDC, climate policy and disaster plan leave nutrition goals implicit.

At the provincial level, the picture is similar. Sindh's 2022 climate policy explicitly connects climate change with food security and malnutrition, but without defining nutrition metrics (Level 3).

[1] National Nutrition Survey (NNS), Pakistan (2018)

[2] Springmann, M., et al. (2016). Global and regional health effects of future food production under climate change: A modelling study. The Lancet, 387(10031), 1937-1946.

Punjab's 2024 climate strategy even commits to "end all forms of malnutrition" and to climate-smart crop diversity but still contains no funding or targets for nutrition outcomes (Level 2). Balochistan's 2024 policy establishes robust climate governance structures and highlights agricultural vulnerabilities but treats nutrition as an implicit co-benefit without concrete targets (Level 3). Khyber Pakhtunkhwa's 2022 plan acknowledges climate shocks to agriculture and health but lacks any nutrition-specific programs or monitoring (Level 3). Provincial disaster or development plans similarly note undernutrition in droughts, but do not incorporate nutrition into climate adaptation frameworks or budgets. Overall, none of the provincial climate documents reaches full system-wide integration (Level 4); most remain at Level 2-3, recognizing nutrition issues in narrative but not operationalizing them.

Pakistan's national climate-health vulnerability assessment (2024) explicitly notes that climate "is the foundational driver of diets" and details region-specific risks (e.g. Tharparkar malnutrition during drought), but it provides no nutrition-focused indicators or dedicated funding streams (Level 3). Subnational reports are weaker: Karachi's climate vulnerability assessment (2024) documents pollutiondriven illness spikes after floods but contains no nutrition-sensitive actions or monitoring targets. Islamabad's City Vulnerability Report (2014) discusses rising flood and heat exposure yet never mentions food security or dietary impacts (Level 1).

Nutrition Policies and Strategies

Nutrition sector policies and strategies have equally limited climate alignment. The Pakistan MultiSectoral Nutrition Strategy (2018-25) calls for resilience-building in food systems and links Water, Sanitation, and Hygiene (WASH) to malnutrition, and even mentions "resilience-centered policies" for shock-prone areas. However, it includes no explicit climate-related nutrition targets (e.g. no goals for reducing stunting or anemia in flood/drought zones) and no budget for climate-smart nutrition interventions. As a result, it is classified at Level 2 integration. Pakistan's Food-Based Dietary Guidelines (2019) are even more narrowly focused: they offer culturally appropriate eating recommendations and note widespread micronutrient deficiencies, but make no reference to climate change or the environment (Level 1). In practice, climate considerations are largely absent from core nutrition documents. By contrast, Pakistan's National Food Security Policy 2018 does explicitly link climate variability to diet quality and advocates climate-smart fortification and crop diversity, but this approach has not been carried into nutrition planning frameworks. The lack of a climate lens in nutrition policies and strategies means opportunities to build drought- and heat-resilient diets or biofortified crops into the nutrition agenda are being missed.

Climate-Nutrition Initiatives and Interventions

The assessment of climate-nutrition initiatives and programs similarly finds no fully integrated models. A review of funded projects shows approximately half of Pakistan's Green Climate Fund (GCF) portfolio has no nutrition component (Level 1), and the rest only modestly consider food security without nutrition outcomes (Level 2). For instance, the GCF's Acumen Climate Action Pakistan Fund (2024) is framed as agriculture and clean-energy adaptation fund, aiming to increase farmer incomes, but it makes no mention of dietary diversity or nutritional objectives (Level 1). The World Bank's Country Partnership Framework (FY26-FY35) acknowledges that Pakistan suffers from severe stunting and climate shocks, but it embeds nutrition under human capital outcomes and climate under rural resilience, with no joint climate-nutrition interventions (Level 2). None of the reviewed initiatives reaches Level 3 or 4 integrationthere are no programs explicitly designed with linked climate and nutrition metrics. Smallerscale examples (e.g. climate-smart school meals or post-disaster feeding) exist, but they generally operate in silos or under humanitarian relief, rather than as systematic nutrition-sensitive climate action.

Climate-Nutrition Data and Knowledge Portals

Data systems analysis also remain siloed. Pakistan's data portals are not integrated: the federal Nutrition Dashboard tracks stunting, wasting and micronutrient rates, but does not pull in climate or weather data (Level 1). The national Climate Change Implementation Tool shows hazards and emission trends but contains no nutrition indicators (Level 1). Even the internationally hosted Food Systems Dashboard (GAIN/FAO) - which links agriculture and diet data - only implicitly touches on climate through crop emissions or biodiversity, without connecting climate shocks to malnutrition outcomes (Level 2). In short, no unified platform exists to overlay nutrition status with climate vulnerability. Stakeholders emphasize this gap i.e., data and information systems do not link climate variables with nutrition outcomes, an area seen as a critical gap to fill.

Comparative Climate-Nutrition Vulnerability Assessment - Pakistan

The comparative climate-nutrition vulnerability assessment highlights regional disparities across Pakistan's seven administrative units, revealing how overlapping climate hazards and nutrition burdens amplify risks for already fragile populations. Using an adapted IPCC framework, the analysis shows that Sindh and Balochistan face the most acute combined vulnerabilities, marked by extreme exposure to floods, droughts, and heatwaves, fragile ecosystems, weak service delivery, and the country's worst rates of wasting, anaemia, and food insecurity. Punjab and Khyber Pakhtunkhwa also show high vulnerability driven by rising urban malnutrition and recurrent climate shocks despite relatively stronger infrastructure, while Gilgit-Baltistan and AJ&K exhibit medium to high vulnerability due to ecological fragility and significant adolescent nutrition deficits. Islamabad Capital Territory reflects high urban climate risks and emerging non-communicable diseases. The findings provide a clear evidence base to prioritize provinces like Sindh for integrated climate-nutrition interventions, combining adaptation measures with targeted nutrition programs to maximize multi-sectoral impact.

In summary, Pakistan's policy landscape is fragmented with respect to climate-nutrition integration. Policies acknowledge the climate-food-nutrition nexus but do not embed it in concrete plans. For example, the NDC, climate policy, and provincial plans generally remain at Level 2 (some intent but no systematic follow-through), while only the NAP achieved Level 4. Key gaps include the absence of climate-sensitive nutrition indicators, limited cross-ministerial coordination, and no dedicated financing for nutrition in climate programs. Stakeholders noted that climate committees rarely include nutrition experts and nutrition forums ignore climate risks. Addressing these shortfalls is at the core of the report's recommendations, for instance, establishing formal climate-nutrition task forces, building joint monitoring systems (linking stunting, dietary diversity etc. with climate data), and mobilizing blended finance for nutrition-sensitive adaptation.

Recommendations

Based on the above findings presented, the recommendations are as follows:

- **Integrated Climate- Nutrition Policies, Strategies, and Action Plans:** Integrate explicit, measurable nutrition/climate objectives within Pakistan's NDCs, NAPs, CCRAs and related climate/nutrition strategies. This includes the adoption of SMART indicators that track the nutritional impacts of climate change and guide evidence-based interventions. For example, promote the cultivation and diversification of nutrient-dense, climate-resilient crops such as drought-tolerant millets, moringa trees, or zinc-fortified wheat. Encourage inclusion of climate-smart dietary goals in agriculture and food security policies.

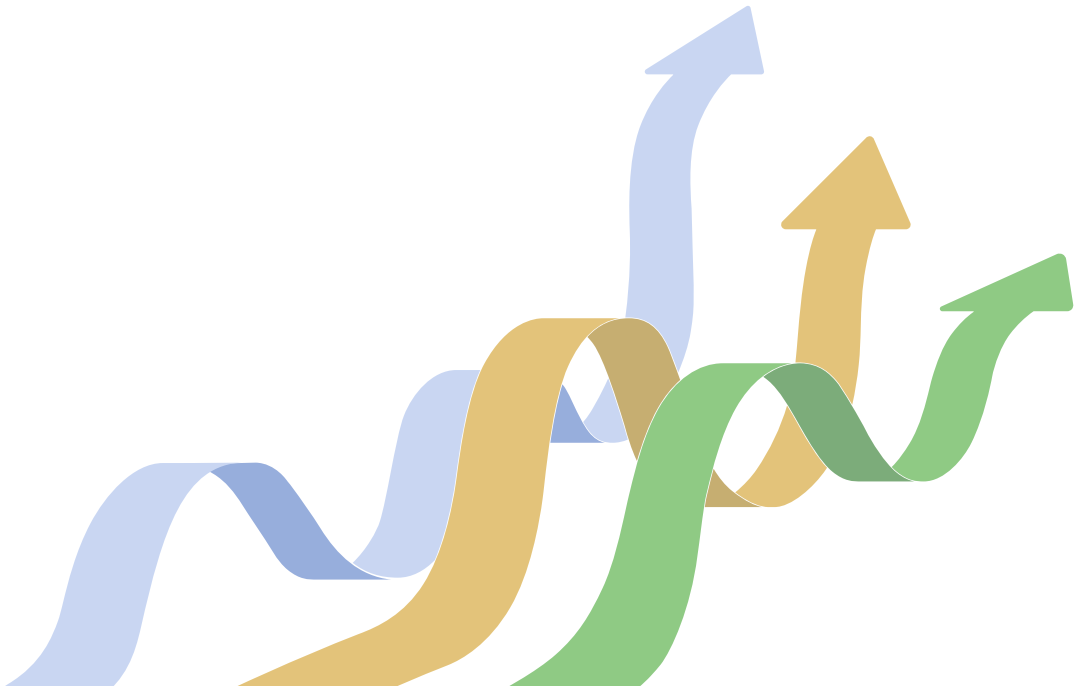
- **Strengthened Cross-Sectoral Coordination Mechanisms:** Strengthen institutional linkages between climate, nutrition, health, agriculture, and food sectors by creating formal coordination platforms such as Climate-Nutrition Task force to facilitate joint planning and implementation of nutrition-sensitive climate actions at national and subnational levels. Local disaster management committees could also integrate nutrition preparedness (e.g. pre-stocking RUTF or mobilizing nutrition teams ahead of floods), ensuring rapid joint action during climate shocks.

- **Integrated Monitoring Systems:** Invest in integrated monitoring systems that include climatenutrition indicators to assess policy effectiveness. Include tools such as district-level vulnerability maps overlaying malnutrition data with climate risk exposure (e.g., drought and flood zones), and incorporate child nutrition metrics (stunting, wasting) into early warning and response systems.

- **Strengthening the Food Systems Dashboard for Climate-Nutrition Linkages:** Enhance the existing Food Systems Dashboard (FSD) to better integrate climate and nutrition data, enabling cross-analysis and evidence based decision making. For example, incorporating localized weather forecast, agricultural outputs, and nutrition indicators could improve its utility for planning interventions such as managing perishable food storage, food supply logistics, and nutrition-sensitive emergency responses. Given current data limitations, improvements could focus on harmonizing available datasets and making the platform more user friendly and actionable for policymakers, researchers and implementers

- **Strengthen Capacity for Climate-Nutrition Integration:** Enhance technical capacity of government staff and stakeholders to implement nutrition-sensitive climate strategies and utilize integrated data systems effectively. Training should cover food system resilience, including sustainable storage, transport, and local food processing.

- **Mobilize Cross-Ministerial Financing:** Identify opportunities for joint resource mobilization of climatenutrition integrated initiatives such as resource allocation between relevant ministries (Health, Climate Change, Food Security, Planning) and development partners. Integrated programs that deliver cobenefits, such as investments in food storage infrastructure, community-based nutrition gardens, cold chain development, or local food packaging units.



1. INTRODUCTION

1.1 PURPOSE OF THE STUDY

Both climate change and malnutrition crises are threatening human health, food security, and sustainable development. Globally, the population at risk of hunger could increase up to 30 percent between 2010 and 2050, due to climate change[1] . The impacts of extreme weather events on food security, nutrition, and livelihoods are especially acute and severe for people residing in sub-Saharan Africa, Asia, small islands, Central and South America and the Arctic and small-scale food producers globally[2] . Climate-related disasters, i.e., storms, floods, and droughts destroy crops and infrastructure. These disruptions disproportionately affect vulnerable populations (Women, the elderly and children in low-income households, Indigenous Peoples, minority groups, small-scale producers), deepening inequalities in access to safe, nutritious food and amplifying health disparities. Similarly, the increase in carbon dioxide in the atmosphere reduces the nutritional value of many staple crops[3] . It is estimated that climate-related dietary changes will contribute to an additional 500,000 deaths a year by 2050[4].

Pakistan, already grappling with climate induced recurrent floods and droughts, faces an expected 19% decline in wheat yields by the 2060s under high-emissions scenarios[5] . In Punjab, where 80% of the country's wheat is grown – yields are expected to decline by nearly one-fifth, threatening national food security[6]. Additionally, a 5% increase in precipitation during September-October could reduce yields by an additional 6%, underscoring how inconsistent rainfall patterns heighten production risks[7]. The increase in food insecurity due to climate change will have profound impacts on nutrition outcomes, particularly in Balochistan, and lower Sindh, which are already highly vulnerable to disasters and food scarcity[8]. Pakistan continues to report some of the highest rates of child stunting (40.2%)[11] and wasting (17.7%)[9] globally, with climate change acting as a risk multiplier, exacerbating existing inequities in access to safe water, diverse diets, and healthcare[10] . Despite these clear interlinkages between climate and nutrition, both agendas continue to operate in isolation. Globally, only 2% of Nationally Determined Contributions (NDCs) evidently address nutrition[11], and most national adaptation plans neglect the inclusion of dietary diversity and food safety. Due to this disconnect Pakistan's policies remain fragmented perpetuating systemic vulnerabilities. This highlights the need for joint action, integrating climate and nutrition can catalyze sustainable development by fostering resilient food systems.

To tackle this issue, the Government of Egypt, as COP27 President, launched the 'Initiative on Climate Action and Nutrition (I-CAN)' in partnership with GAIN, WHO, FAO, the SUN Movement and UNEP. The global, multi-sectoral initiative aims to foster collaboration and the intersection of climate, nutrition and health through integrated cross-sectoral strategies. The initiative focuses on promoting climate-resilient nutrition solutions through integrated, cross-sectoral strategies. The objective of this baseline assessment is to examine the current level of integration between climate and nutrition, in Pakistan country context, across existing policies, strategies etc., and to identify opportunities for improved alignment.

[1] Van Dijk, Michael, Tom Morley, Marie Louise Rau ML, and Yashar Saghai. 2021. "A Meta-Analysis of Projected Global Food Demand and Population at Risk of Hunger for the Period 2010–2050." Nature Food 2: 494–501.
[2] IPCC (2022). Climate Change 2022: Impacts, Adaptation, and Vulnerability. Intergovernmental Panel on Climate Change.
[3] Banchiywsen Kidane , Markos Makiso Urugo , Hurgesa Hundera Hirpha , Tsegayenesh Paulos , Wesena Hundea , Fikadu Tessema (2025). Nutritional Challenges of staple crops due to increasing atmospheric carbon dioxide levels: Case of Sub-Saharan Africa.Journal of Agriculture and Food Research.Volume 19.101592.
[4] Springmann, M., et al. (2016). Global and regional health effects of future food production under climate change: A modelling study. The Lancet, 387(10031), 1937-1946.
[5] World Bank (2024). Pakistan Climate and Health Vulnerability Assessment.
[6] Fang, Cheng, and Issa Sanogo. 2014. Food Price Volatility and Natural Hazards in Pakistan: Measuring the Impacts on Hunger and Food Assistance. Rome, Italy: FAO.
[7] Mahmood, N., B. Ahmad, S. Hassan, and K. Bakhsh. 2012. "Impact of Temperature and Precipitation on Rice Productivity in Rice-Wheat Cropping System of Punjab Province." Journal of Animal & Plant Science 22 (4): 993–7.
[8] NDMA (National Disaster Management Authority Pakistan) and WFP. 2017. Integrated Context Analysis (ICA) on Vulnerability to Food Insecurity and Natural Hazards: Pakistan. Islamabad, Pakistan: NDMA and WFP. [11] National Nutrition Survey (NNS), Pakistan (2018).
[9] National Nutrition Survey(NNS) Pakistan (2018)
[10] World Bank (2023). Pakistan Country Climate and Development Report.
[11] GAIN (2023). Initiative on Climate Action and Nutrition (I-CAN): Baseline Assessment Report.

2. BASELINE METHODOLOGY

The baseline assessment utilized the global I-CAN assessment framework as the analytical foundation of this exercise, structured around the following four pillars:

- **Implementation, Action, and Support** - assessing on-the-ground actions and programmatic support mechanisms.
- **Capacity Building, Data, and Knowledge Transfer** - reviewing institutional capacities, information flows, and learning systems.
- **Policy and Strategy -** examining the extent to which nutrition considerations are embedded within climate related plans and policies.
- **Investments -** analyzing financial flows, budgeting priorities, and resource allocation linked to integrated climate-nutrition action.

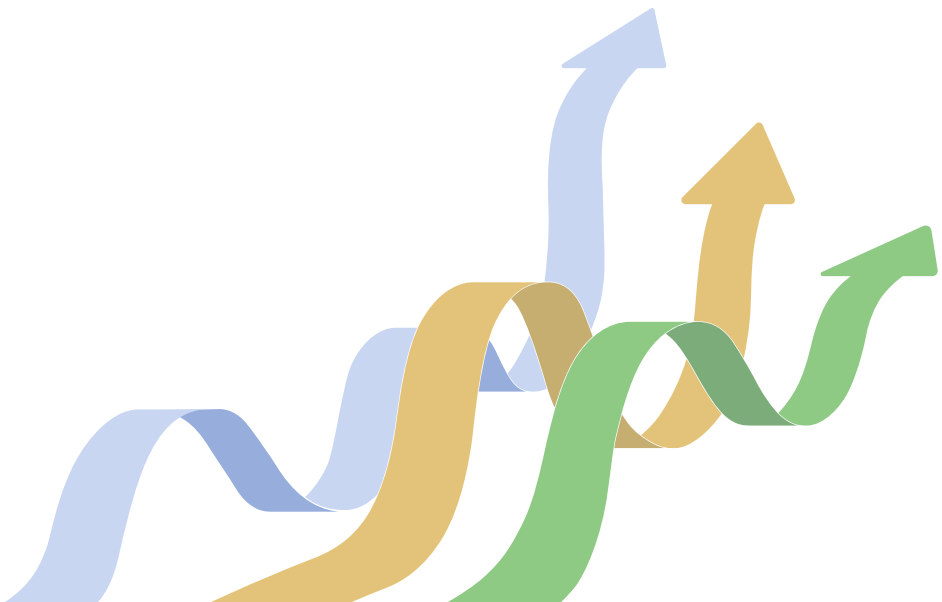
The study team, in consultation with GAIN, identified assessment indicators under each of the abovementioned pillars, details are provided in the table below. Besides, the study team review following documents against the indicator.

Table 1: Adapted Indicators for Pakistan I-CAN Baseline Assessment[12]

Pillars	Indicator (Global Level)	Indicator (Adapted for National Context)	Is this indicator assessed in this baseline report?
Pillar 1: Implementation, Action, and Support	1.1 Number of NDCs that include nutrition-related actions	1.1 Extent to which Pakistan's NDC document integrates nutrition-related actions	Yes
	1.2 Number of climate National Adaptation Plans (NAPs) that include nutrition-related actions	1.2 Extent to which Pakistan's NAP document integrates nutrition-related actions	Yes
	1.3 Number of climate-informed nutrition interventions and programmes	1.3 Number of climate-informed nutrition interventions and programmes in Pakistan	Yes
	1.4 Number of National Nutrition Plans (NNPs) that refer to climate	1.4 Extent to which Pakistan's national nutrition policy documents refer to climate	Yes
	1.5 Number of significant multilateral partnerships in the climate-nutrition area		No - original analysis was conducted, but previously the ICAN baseline team has decided not to include this given the difficulties in accurately capturing all such partnerships and due to lack of certainty in putting merit into the quantity over quality of partnerships. The study team also dropped this indicator for this baseline assessment report.

[12] Adapted from the I-CAN Global Indicators for application to a single-country context i.e., Pakistan. Focus is on the extent of integration within relevant documents/policies/strategies/initiatives, not on number of countries.

Pillar 2: Capacity Building, Data and Knowledge Transfer	2.1 Value of public R&D funding programmes that bridge climate and nutrition		No - in the previous I-CAN baseline report shared with the study team, this indicator was not included due to the difficulties in accurately assessing it.
	2.2a Number of countries that have conducted a climate change and health vulnerability assessment (V&A) which included nutrition	2.2a Number of documents that have conducted a climate change and health vulnerability assessment (V&A) which included nutrition	Yes
	2.2b Number of data and knowledge portals that bring climate and nutrition together	2.2b Number of data and knowledge portals that bring climate and nutrition together in Pakistan	Yes
	2.3 Number of references to nutrition science articles in Intergovernmental Panel on Climate Change (IPCC) reports		No - it pertains to global IPCC reports, rendering this indicator ineffective for assessing national-level integration or implementation. As explained in the Global I-CAN Baseline Report, this indicator is intended for global rather than national contexts.
	2.4 Global Nutrition Report tracks nutrition-promoting climate adaptation actions		No - the Global Nutrition Report tracks global commitments. As explained in the Global I-CAN Baseline Report, the indicator is intended for global rather than national contexts and thus do not inform or measure the national or sub-national integration between climate action and nutrition policies within Pakistan.



Pillar 3: Policy and Strategy	3.1 Number of countries which are promoting climate-smart nutritious foods such as neglected underutilized species (NUS) and fortified / biofortified crops and staple foods	3.1 Number of documents which are promoting climate-smart nutritious foods such as neglected underutilized species (NUS) and fortified / biofortified crops and staple foods	Yes
	3.2 Number of country food-based dietary guidelines that include climate considerations	3.2 Number of food-based dietary guidelines documents that include climate considerations	Yes
	3.3 Number of countries that factor climate into food procurement decisions for food in public settings (e.g., school meals and school feeding, health and care facilities), as well as safety nets and emergency programmes		No - this indicator is partially addressed by other indicators, such as indicator 3.2 on Food Base Dietary Guidelines (FBDGs) and indicator 1.3 on climate-informed nutrition interventions and programmes.
	3.4 Number of healthy diet campaigns that also refer to sustainability, especially for children		No - in the previous I-CAN baseline report shared with the study team, this indicator was not included due to the difficulties in accurately assessing it.
	3.5 Number of countries with food control systems adapted to the increased food safety risks associated with climate change		No - in the previous I-CAN baseline report shared with the study team, this indicator was not included due to the difficulties in accurately assessing it.
Pillar 4: Investments	4.1 Value of Green Climate Fund initiatives that include nutrition considerations	4.1 Value of Green Climate Fund initiatives in Pakistan that include nutrition considerations	Yes
	4.2 Value of World Bank loans that are nutrition and climate supporting	4.2 Value of World Bank initiatives in Pakistan that are nutrition and climate supporting	Yes
	4.3 Value of food impact investing funds that build in climate considerations		No - in the previous I-CAN baseline report shared with the study team, this indicator was not included as there is currently no accurate way to assess this indicator.
	4.4 Number of companies in World Benchmark Alliance that score well on nutrition and sustainability		No. It is not applicable in Pakistan context as it refers to World Benchmark Alliance - an alliance at world level.
	4.5 Value of Official Development Assistance (ODA) to climate that is linked to nutrition		No, the relevant ODA proposals were not available.

To list down relevant documents for the assessment, the study team carried out mapping exercise of national and provincial policies, frameworks, programs, and initiatives related to climate and nutrition across Pakistan. This was carried out through a review of government websites, policy databases, and publications from relevant ministries, such as Ministry of Climate Change, Ministry of National Food Security and Research (MoNFSR), Ministry of National Health Services Regulation and Coordination (MoNHSR&C), and their provincial counterparts. In addition to the document review, the assessment methodology was further strengthened by incorporating primary qualitative data gathered through 20 Key Informant Interviews [13] (KIIs), 8 Focus Group Discussions (FGDs) [14] , and a national stakeholder validation workshop. These tools were used to triangulate findings and incorporate perspectives from government, development partners, research institutions, and community members. Insights from national workshop and KIIs with government and development actors provided contextual information on policy development and implementation challenges. FGDs with community members in the priority province revealed experiences of climate-related shocks and food insecurity, which informed the interpretation of integration levels.

To assign level of integration between climate change and nutrition, a scale of four levels was used. The definitions for the four levels used for this study are aligned with the I-CAN Global Baseline assessment approach. Each level was defined and also assigned a color code as shown in the figure below:

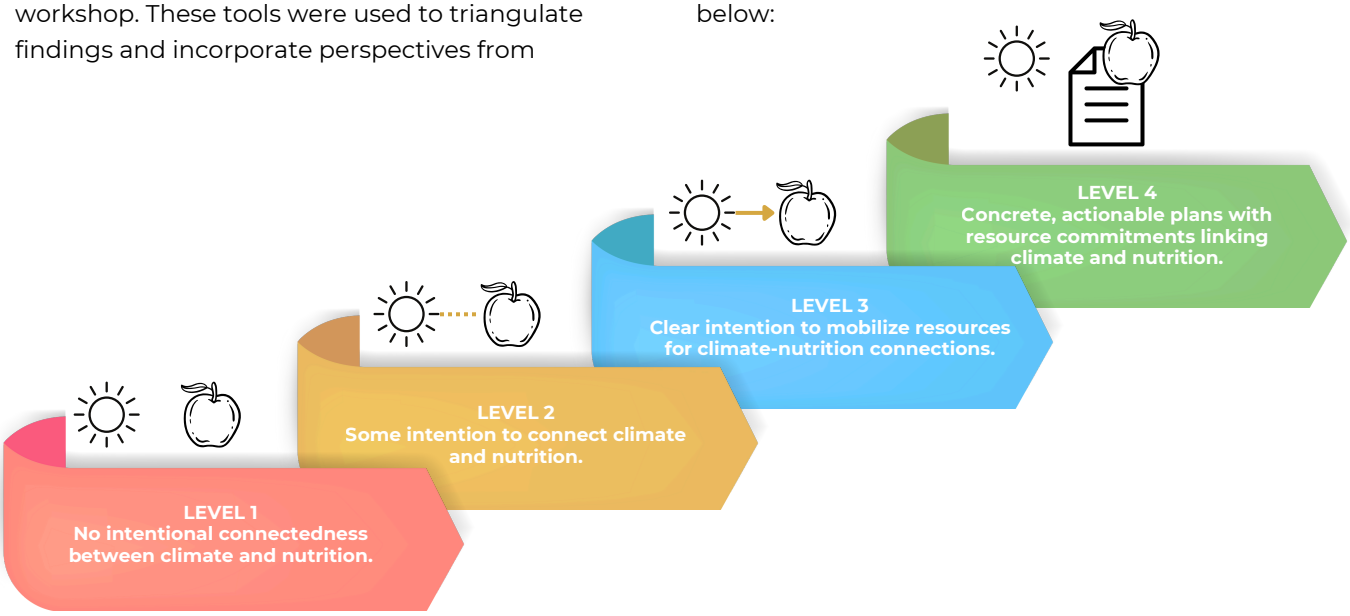


Figure 1. *I-CAN Levels of Integration*

Overall, for the baseline study, the following approach was adopted to analyze data and assess the extent of integration between climate and nutrition considerations across key policy and strategic documents. Initially, climate and nutrition keywords were cross-applied to identify linkages, this was followed by manual content reviews to contextualize findings and assign integration scores based on I-CAN Levels of Integration (Level 1: no integration to Level 4: explicit integration). AI tools supplemented keyword discovery, which may have not appeared during manual review. This ensured the reliability and completeness of the analysis. The findings from the KIIs, FGDs and national workshop were inserted against the four I-CAN pillars to validate the integration levels identified through document review. This triangulation helped capture not only policy intent but also implementation barriers and community-level impacts. Aggregated scores were presented using data visualization to illustrate integration levels.

3. FINDINGS

This section presents the results of the I-CAN Pakistan baseline assessment, structured around Pakistan's climate and nutrition policy landscape, related initiatives, and knowledge systems. Developing on the ICAN framework and evidence gathered through policy reviews, key informant interviews, focus group discussions, and a national validation workshop, the findings offer a detailed picture of how climate and nutrition priorities intersect in Pakistan's planning and implementation frameworks. The analysis is organized into four subsections i.e., climate policies and strategies; nutrition policies and strategies; climate-nutrition initiatives and interventions; climate-nutrition data and knowledge portals; and comparative climate-nutrition V&A of Pakistan, each illustrating current levels of integration and opportunities for improvement.

3.1 CLIMATE POLICIES AND STRATEGIES

Pakistan has developed a wide array of climate policies, plans, and strategic frameworks at the national and provincial levels that articulate commitments to mitigation, adaptation, and disaster resilience. This section reviews these key documents through the lens of climate-nutrition integration, assessing the extent to which they explicitly recognize, prioritize, and operationalize nutrition-sensitive actions within climate agendas. Drawing on the I-CAN methodology, each policy or strategy is assigned an integration level (from Level 1 to Level 4), supported by direct excerpts, stakeholder inputs, and comparative analysis with global best practices. The findings reveal significant progress in acknowledging climate risks to food systems and public health, while also exposing gaps in measurable nutrition targets, budgetary allocations, and cross-sectoral institutional mechanisms. By examining both national policies and strategies such as the Updated NDC 2021, NAP 2023, National Climate Change Policy 2021, and the National Disaster Management Plan 2025; and provincial climate change policies and strategies, this section highlights current strengths, areas for improvement, and pathways to advance climate-nutrition integration across Pakistan's policy landscape.

i. National Level

The study team reviewed the following climate documents at national level, and assigned them ratings:

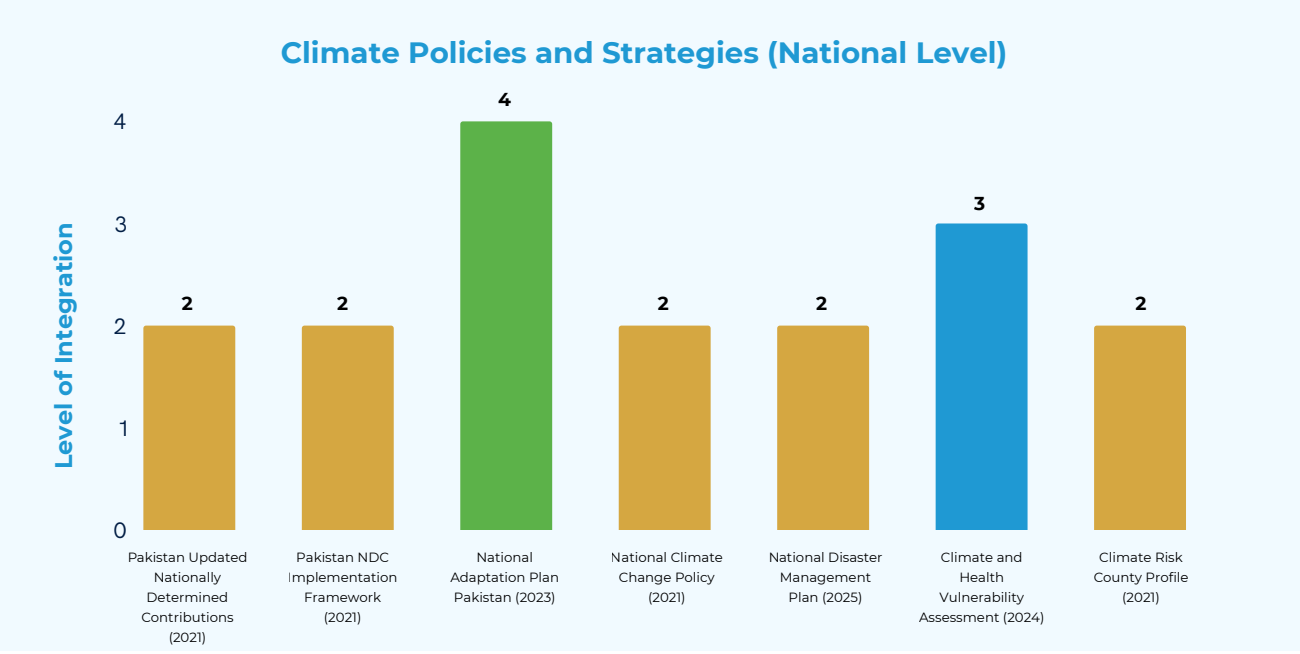


Figure 2. *Climate Policies and Strategies at National Level (Level of Integration)*

Pakistan Updated Nationally Determined Contributions (2021) [15] : As per I-CAN Global Baseline Assessment report, "NDCs are national climate pledges contributed by each country under the Paris Agreement, submitted every 5 years to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat. Intended climate mitigation and adaptation actions are listed in support of the UNFCCC's goal to limit global temperature increase to 1.5°C above pre-industrial levels. It is imperative for nutrition to be considered within NDCs as these climate mitigation and adaptation measures will have a direct and significant impact on nutritional outcomes. "

The study team reviewed "Nationally Determined Contributions Pakistan" document for the climatenutrition integration as per the criteria discussed earlier in this report. The overall climate-nutrition integration of this document is meeting Level 2 i.e. some intention to connect climate and nutrition.

This conclusion is drawn based on the following reasons. The NDC clearly states: "The increased temperatures, and variations in precipitation and monsoon patterns coupled with increased carbon, are resulting in decreased protein, zinc, iron, and quality of protein in crops." This nutritional decline is further elaborated as: "This results in decreased dietary protein causing malnutrition and stunting." The document highlights broader vulnerabilities by stating: "While the extreme weather events often cause crop failures threatening food security, the increased temperatures, and variations in precipitation and monsoon patterns coupled with increased carbon, are resulting in decreased protein, zinc, iron, and quality of protein in crops."

In terms of population exposure, the NDC notes: "The country is increasingly exposed and vulnerable to various natural hazards, particularly floods, tropical cyclones, droughts, landslides, Glacial Lake Outburst Floods (GLOFs) and earthquakes." It further states: "The poor are the most vulnerable as they are the most reliant on agriculture, livestock, fisheries, forests and groundwater that is heavily degraded, and are the most directly impacted by natural disasters and slow onset of climate change." Adding to this, the NDC reports: "Adverse impacts of climate change are the major causes of losses in livelihoods, productivity, and human and livestock health." and "In Fiscal Year (FY) 2020, 40% of households suffered from moderate to severe food insecurity and therefore cannot absorb further climate shocks to food systems."

On the adaptation side, the NDC explains: "By 2030, the project envisages the reduction of flood risk and enhanced water recharge at six sites in the Indus Basin, building resilience of 10 million people, as well as strengthening vulnerable ecosystems." It also highlights: "Pakistan's biggest domestic climate change challenge is adaptation as Pakistan has been ranked by Germanwatch as the 8th most affected country in the world over the period 2000-2019."

From the health and food systems perspective, the NDC mentions: "The degrading ecosystems have been costly for human health, adversely impacted water-agriculture, and the reduced productivity of ecosystems." and: "Most frequent compound extreme events are heatwaves and droughts in parts of Balochistan and Sindh."

Discussion with Academia

The NDC also records: "Summer temperatures in the city of Jacobabad in Pakistan's Sindh province have been recorded at 52°C. Biologically, humans cannot withstand heat beyond the threshold of 52°C." and "Increased cases of vector-borne diseases such as dengue."

Despite this awareness, the NDC lacks explicit nutrition-focused targets or indicators, specific budget allocations or programs aimed at improving nutrition outcomes, and cross-sectoral plans that integrate health/nutrition with climate adaptation or mitigation.

[15] Government of Pakistan. (2021). Pakistan Updated Nationally Determined Contribution (NDC) 2021. Ministry of Climate Change.

> *The absence of integrated indicators in monitoring frameworks was acknowledged... for example, one participant mentioned a provincial food security dashboard that had started to incorporate a few climate indicators"*
>
> ***National Stakeholder Workshop***

There is also no evidence of coordinated resource mobilization, institutional mechanisms, or policy planning dedicated specifically to link climate action with nutrition improvements, which would have supported a Level 3 or Level 4 classification of this document.

> *Institutional coordination across sectors is limited: for example, it was noted that climate change working groups or task forces rarely include nutrition experts, and nutrition coordination forums (like multi-sectoral nutrition committees) often do not have representation from climate or environment departments."*
>
> ***National Stakeholder Workshop***

> *"We are working on alternate crops and resilient crops according to climate... We are observing a big change in temperature and precipitation patterns, so we are focusing on new farming approaches and highly nutritious crops."*
>
> ***Discussion with Academia***

We chose to use Benin's NDC as a benchmark for nutrition-climate integration to compare with Pakistan's NDC. Both countries are highly climate-vulnerable globally, facing recurrent climate-induced disasters such as floods and droughts, which impact their agriculture-dependent livelihoods and food security. According to the Global Climate Risk Index 2025 by Germanwatch, Pakistan was ranked as the most vulnerable country to climate change in 2022, primarily due to the devastating floods that year. Similarly, Benin ranks 152nd out of 181 countries on the extreme climate vulnerability index, highlighting its exposure to climate-related risks[16] . Benin's NDC is relevant as it demonstrates institutional efforts to integrate climate and nutrition, offering practical lessons for strengthening Pakistan's commitments.

This assessment aims to highlight tangible pathways for strengthening climate-nutrition linkages in Pakistan's national commitments. The choice of Benin also reflects similarities in terms of reliance on agriculture for livelihoods, vulnerability to food insecurity, and institutional efforts to mainstream climate and nutrition priorities. This contextual alignment justifies the relevance of using Benin's NDC as a benchmark to guide improvements in Pakistan's climate-nutrition integration.

16 World Bank Group. Benin - Country Climate and Development Report (English). Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/099120423163539177

Table 2: Pakistan NDC in Comparison with Best Practice NDC			
Key Element	**Benin NDC (2021)**	**Pakistan NDC (2021)**	**Gap/Comment for Pakistan**
Explicit mention of nutrition in climate mitigation/adaptation	Yes - climate nutrition health vulnerabilities are acknowledged, especially in agriculture and water sectors	No direct mention of nutrition or link to undernutrition, stunting, food systems, or dietary resilience	Lacks any explicit recognition of nutrition within climate risks or response strategies
Integration of food systems in mitigation and adaptation sectors	Clearly addresses agriculture as both a Greenhouse Gases (GHG) contributor and a vulnerable sector; includes climate-smart agriculture (CSA) strategies	Agriculture is mentioned, but the focus is mostly on emissions/sequestration (e.g., Ten Billion Tree Tsunami Program (TBTTP)); lacks linkage to food systems	No coherent food systems approach or mention of co-benefits for nutrition
Sectoral adaptation targets tied to nutrition sensitive sectors	Includes targets for agriculture, water, coastal zones, and forestry with climatehealth-nutrition co- benefits	Adaptation focuses on flood management (Recharge Pakistan), afforestation, and protected areas	No explicit sectoral adaptation targets that link to human development or nutrition outcomes
Institutional mechanism includes ministries of health, nutrition, or food	Multi-sectoral coordination includes local governments, agriculture, environment, health, and civil society	Coordination sits with Ministry of Climate Change; other sectors are mentioned, but no role for MoNFSR or MoNHSR&C noted	Coordination does not include food or health sectors relevant to nutrition
Budget or financing needs include food/nutrition adaptation actions	Yes - climate financing section includes nutrition-relevant adaptation needs (e.g., CSA, resilient livelihoods)	Focuses on energy, transport, forestry, and NbS; no reference to nutrition or food-based climate financing needs	Does not present nutrition-sensitive budget lines or investment needs

Disaggregation or metrics proposed for nutrition-sensitive indicators	Uses V&A and suggests gender-disaggregated, sectoral data for food/agriculture	Focus on Measurement, Reporting and Verification (MRV) and GHG inventories; lacks disaggregation of cobenefit indicators (e.g., livelihoods, health, nutrition)	No integrated indicators to track nutrition-related impacts of climate actions
NDC includes links with national nutrition strategies/plans	Reference to Benin's National Adaptation Programme of Action with regard to climate change (NAPA), national strategies aligned with Sustainable Development Goals (SDGs) and food/nutrition security goals	Anchored in climate policies; no cross-reference to Pakistan Multi-sectoral Nutrition Strategy or NNP	Missed opportunity to align climate and nutrition strategies under SDG 2 and SDG 13
Identification of vulnerable populations (children, women, malnourished)	Prioritizes poor, food-insecure, rural populations; highlights gender and child vulnerability to climate impacts	Vulnerable populations (women, youth) are mentioned generally, but without targeting nutrition or food insecurity impacts	No nutrition-specific vulnerability lens applied
Gender and social inclusion with food/nutrition relevance	Gender is mainstreamed in adaptation, with relevance to food/nutrition security of women farmers	Gender and youth are mentioned under "cross-cutters", but not operationalized in food/nutrition terms	Gender strategy is disconnected from food and nutrition systems
Level of Integration per ICAN (1.1 - NDCs with nutrition)	Level 4 - Commitment to mobilising resources and with distinct plans to take action to connect climate and nutrition	Level 2 - Some intention to connect climate and nutrition	To move towards Level 3 or Pakistan explicitly 4, must nutrition link within mitigation and adaptation actions

In summary, to improve the climate-nutrition integration level of this document, the following measures could be adopted:

- The policy should set clear and measurable nutrition-related targets within climate-sensitive sectors such as agriculture, water, and disaster risk reduction. This includes defining indicators to track climate-induced malnutrition (e.g., stunting reduction in high-risk districts) and promoting nutrientrich, climate-resilient crops like biofortified wheat and millets to improve both dietary quality and agricultural sustainability. Water, sanitation, and hygiene (WASH) interventions must be mainstreamed within food and agriculture programs to prevent disease-related undernutrition. Simultaneously, climate-nutrition education should be expanded through existing community structures, including Lady Health Workers and agricultural extension staff, to strengthen public awareness and behavior change at the grassroots level.

- Building institutional capacity is equally vital. Cross-sectoral training and technical support should be provided to staff within the health, agriculture, and climate sectors to effectively design and implement integrated interventions. At the governance level, the active involvement of the Ministry of National Health Services, Regulations & Coordination (MoNHSR&C) and the Ministry of National Food Security & Research (MoNFSR) in the review and implementation of the NDCs will help ensure that nutrition-sensitive planning is embedded into climate action.

- Nutrition should also be systematically integrated into MRV systems. Key nutrition outcome indicators-such as dietary diversity and child growth metrics-must be included within climate policy tracking frameworks. To better understand the differential impacts of climate change, these indicators should be disaggregated by gender, age, and geography to inform more equitable and responsive policy actions.

- In addition, climate V&A should explicitly include nutrition-related risks such as food insecurity, undernutrition, and micronutrient deficiencies. Doing so will ensure that nutrition is treated not just as a social development issue but as a critical component of climate resilience planning. Aligning climate strategies with existing national nutrition policies and global frameworks, such as Sustainable Development Goal 2 (Zero Hunger), will enhance policy coherence and accountability across sectors.

- Finally, the policy should embed food systems and dietary resilience in both mitigation and adaptation efforts. On the mitigation front, this includes promoting CSA and reducing emissions from livestock. On the adaptation side, it entails scaling up nutrition-sensitive interventions like drought-tolerant crops and school meal programs. These integrated approaches will not only address the impacts of climate change on nutrition but also strengthen the overall resilience of food systems and vulnerable populations.

Pakistan NDC Implementation Framework (2021)[17]: The study team analyzed the NDC Implementation Framework of Pakistan to assess the degree of climate-nutrition integration, applying the criteria established earlier in this report. Based on this review, the document has been rated at Level 2 - indicating some intention to connect climate action with nutrition-related goals.

The NDC Implementation Framework acknowledges the interconnected risks of climate change and food insecurity, referencing malnutrition in the provincial context (e.g., Punjab and Balochistan). “It has been reported that malnutrition is one of the serious concerns that plagues the province, particularly in children”(Punjab). Similarly, in Balochistan, “The drought was also responsible for the spread of numerous diseases such as... Malnutrition... ” and “The infant and under-five mortality in Balochistan is estimated to be 72 and 89 per thousand births, respectively.”

[17]Ministry of Climate Change. (2021). Pakistan NDC Implementation Framework Template: Provincial Information and Roadmap. Government of Pakistan.

However, nutrition is not treated as a core theme in national-level mitigation or adaptation strategies. While there are health-related goals, climate. nutrition links are only indirectly acknowledged through general references to agriculture, WASH, and disease. For instance, the document proposes to "Establish mechanisms to facilitate collaboration between health, nutrition and energy professionals, including dialogue and collaboration between Ministries of Health, Climate and Energy as well as multi-sectoral co-operations." There is no concrete plan, policy directive, budget line, or programmatic intervention that systematically integrates neither nutrition goals into climate actions, nor a commitment to track or finance climate-nutrition linkages.

In summary, to improve the climate-nutrition integration level of this document, the following measures could be adopted:

- Integrate nutrition outcomes (e.g., dietary diversity, micronutrient security) as explicit objectives within climate adaptation and mitigation actions.
- Include nutrition-sensitive agricultural planning, like climate-resilient biofortified crops or integrated food systems approaches.
- Institutionalize multi-sectoral coordination mechanisms involving climate, agriculture, health, and nutrition ministries.
- Establish dedicated indicators, and M&E plans for climate-nutrition synergies at national and provincial levels.
- Prioritize nutrition-sensitive interventions in vulnerable populations within DRR, health, WASH, and energy sectors.

"Even in the NDCs-2, nutrition has not been addressed. The work on NDC-3 is ongoing, and GAIN is advocating for the inclusion of nutrition in that document."

Discussion with GAIN

Discussion with Development Organizations

National Adaptation Plan, Pakistan (2023)[18]: As per I-CAN Global Baseline Assessment report, "NAPs seek to identify and address medium to long term climate adaptation needs, contributing to increased climate resilience and the integration of climate frameworks into policies and programmes across various sectors. They are action-oriented policy documents which have distinct impacts on nutritional outcomes."

The National Adaptation Plan (NAP) of Pakistan 2023 demonstrates a clear and intentional integration of climate and nutrition linkages, supported by concrete commitments and actionable measures. For instance, the NAP states: "Pakistan is already a food-insecure country: approximately 40 percent of households already grapple with this pressing issue, and climate change threatens to exacerbate the situation to a distressing 60 percent by the year 2050." It explicitly recognizes malnutrition risks, noting: "Nearly 40 percent of Pakistan's population is food insecure. The prevalence of child malnutrition is amongst one of the highest in the world and continues to increase." The plan links these challenges directly to climate impacts, such as "Drought periods (1969, 1974, 1987, 2002, and 2013-2015) (which) have been associated with acute and chronic malnutrition," and highlights specific crises like "In Tharparkar (Sindh), for example, many children died of malnutrition in 2014 after severely reduced rainfall from March 2013 to February 2014."

[18]Government of Pakistan. (2023). Pakistan National Adaptation Plan (NAP). Ministry of Climate Change.

To address these issues, the NAP outlines strategic actions, including resilient agriculture measures such as "Tailoring extension services to agro-ecological zones, fostering inclusivity in the development process, and learning from past successful pilots (e.g., expansion of olive cultivation)." It also emphasizes reducing food waste through "investing in agricultural storage, transport, and investments in physical and communication infrastructure that integrate farmers with value-chains." Water scarcity-a critical factor in nutrition-is flagged with warnings like "Pakistan Council of Research in Water Resources (PCRWR) has warned that the country will approach absolute water scarcity by 2025," and notes the health consequences of pollution: "Furthermore, rivers, wetlands, and aquifers are heavily polluted as they receive untreated sewage and industrial effluent... (leading to) vector-borne diseases like malaria, diarrhea, and heat stress, exacerbated by climate change."

Institutional coordination is central to the plan, with cross-sectoral efforts involving entities such as the Ministry of Climate Change & Environmental Coordination, National Disaster Management Authority, and provincial agencies. The NAP mandates "Regular consultations, workshops, and feedback mechanisms... to facilitate effective communication and participation throughout the process," and includes a Monitoring and evaluation (M&E) framework to track progress on indicators like food security and human capital.

Financing is prioritized, with the NAP stressing: "Mobilizing climate financing as part of the redistribution of resources pledged by developed countries... in line with the Common but Differentiated Responsibilities (CBDR) principle. “It also underscores social inclusion, particularly for marginalized groups, stating: "Women are disproportionately vulnerable because their socioeconomic status is not equal to those of men, reflecting patriarchal norms and attitudes," and "Globally, women are 14 times more likely to die when a disaster hits."

By anchoring its approach in these evidence-based measures-from crop resilience to gender-responsive disaster management-the NAP achieves Level 4 integration, ensuring climate-nutrition linkages are operationalized system-wide.

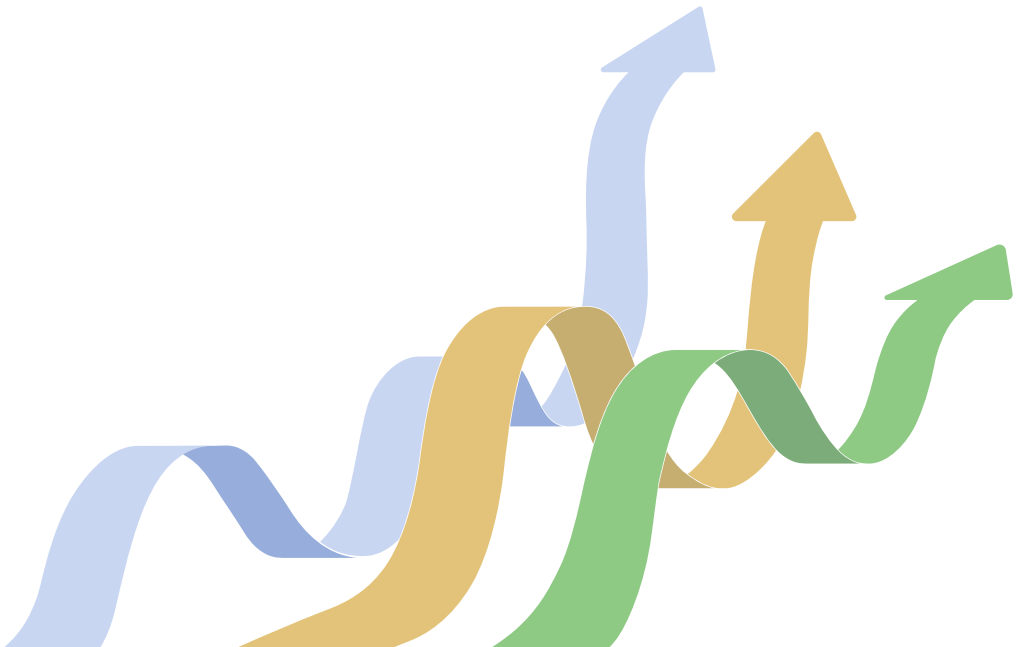


Table 3: Pakistan NAP in Comparison with Best Practice NAP

Key Nutrition Element	Bangladesh NAP (2022)	Pakistan NAP (2023)	Gap/Comment for Pakistan
Explicit Acknowledgment of Climate-Nutrition Linkages	Clearly acknowledges climate-induced food and nutrition insecurity, including effects on vulnerable populations	Recognizes high rates of food insecurity and malnutrition linked to climate shocks (e.g., Tharparkar case), but less consistently throughout the document	Needs consistent framing of nutrition as a core climate adaptation concern
Nutrition-Specific Adaptation Goals or Strategies	Sets a dedicated goal: "Develop climate-resilient agriculture for food, nutrition, and livelihood security"	Includes general food security and agriculture actions; lacks standalone nutrition-specific adaptation goals	No goal or strategy specifically focused on reducing malnutrition under climate stress
Inclusion of Nutrition in M&E	SMART indicators include nutrition-related outcomes (e.g., improved food/nutrition security, dietary quality)	References food security broadly; lacks nutrition-specific M&E indicators (e.g., stunting, wasting, dietary diversity)	M&E system needs inclusion of nutrition-sensitive indicators for adaptation tracking
Reference to Nutrition-Related Vulnerable Groups	Identifies women, children, elderly, persons with disabilities as nutritionally vulnerable to climate risks	Refers to vulnerability of women and poor households; only occasional links to nutrition vulnerability	Needs to highlight nutritionvulnerable populations and tailor actions accordingly
Cross-Sectoral Coordination on Nutrition	Institutional mechanisms include ministries of agriculture, health, food, and social welfare	Coordination mainly led by Ministry of Climate Change; no clear role for health or nutrition ministries	Requires formal roles for MoNHSR&C and MoNFSR in adaptation planning and delivery
Nutrition-Linked Adaptation Interventions	Promotes CSA, resilient food systems, and year round food production to improve diets	Proposes measures like drought-resilient crops and food storage, but nutrition impact not always explicit	Needs to clearly identify how each food/agriculture intervention contributes to nutrition resilience
Nutrition Financing in Climate Context	Proposes dedicated budget allocations for nutrition-sensitive adaptation (e.g., CSA, food access)	Mentions climate finance needs broadly; does not earmark any funds for nutrition-relevant adaptation	No nutrition-sensitive budget lines in NAP adaptation financing
Integration with National Nutrition Strategies	Aligns with national food and nutrition policies and SDG 2	Does not reference the Pakistan Multi-Sectoral Nutrition Strategy or Adolescent Nutrition Strategy	Missed opportunity to link adaptation actions with existing NNPs

The following measures can be taken to enhance the climate-nutrition integration:

- Develop dedicated nutrition-specific adaptation programs under NAP implementation frameworks, including targets for stunting reduction, dietary diversity improvement, and addressing acute malnutrition post-disasters.
- Integrate detailed climate-nutrition indicators (e.g., child wasting prevalence post-floods, seasonal food security variations) within the national M&E system.
- Enhance collaboration between climate, health, agriculture, and social protection sectors at federal and provincial levels for joint climate-nutrition programming.
- Mobilize climate finance targeted at nutrition-sensitive adaptation projects, including food security resilience initiatives in drought- and flood-prone districts.
- Invest in climate-resilient nutrition interventions, such as promotion of drought-resistant nutritious crops (e.g., millet, lentils), sustainable homestead food production, and biofortification initiatives.
- Expand the scope of climate communication strategies to include awareness campaigns on climate-resilient diets, safe water use, and nutrition behaviors in the context of climate shocks.

National Climate Change Policy (2021)[19]: The rationale for classifying the National Climate Change Policy 2021 at Level 2 for climate-nutrition integration lies in the fact that although the policy highlights food security, human health, and agricultural resilience, it stops short of proposing direct, budgeted, or institutionalized nutrition actions. The policy clearly states, "Pakistan has recently launched a National Food Security Policy-2018 and one of its goals is to make agriculture more productive, profitable and climate resilient". It recognizes that rising temperatures will "speed up crop growth and shorten the time between sowing and harvesting… (which) could have an adverse effect on productivity of crops and fodder for livestock". However, these insights into food system vulnerabilities are not explicitly translated into nutrition-focused targets.

The policy commits to actions like "improve the nutritional quality of feed through the use of multinutrient blocks (MNB) prepared from urea, molasses, vitamins and minerals" and "establishing livestock disease monitoring and surveillance systems at district level," but these remain isolated efforts within the agriculture and livestock sectors and are not aligned with national nutrition goals or frameworks such as the Multi-Sectoral Nutrition Strategy.

Under the section on human health, the policy includes the intention to "conduct assessments on the impacts of climate change on vector/waterborne and nutritional diseases," and to "ensure that preventive measures and resources such as vaccines, good quality medication and clean drinking water are available to the general public". While this indicates some acknowledgement of nutrition-related vulnerabilities, it lacks follow-up mechanisms for implementation, monitoring, or inter-sectoral coordination with nutrition-focused ministries or strategies.

Furthermore, the document does not mention the National Nutrition Policy or propose any specific indicators to monitor climate's impact on nutrition outcomes such as stunting, wasting, or dietary diversity. There is also no reference to budgetary allocations for nutrition within climate actions or integration of nutrition into the policy's financing strategies. Despite stating its goal to "track impact of climate change on water, food and energy security", the policy misses the opportunity to link climate-resilient food systems with national nutrition planning.

[19]Government of Pakistan. (2021). National Climate Change Policy 2021. Ministry of Climate Change.

Therefore, while the policy provides broad coverage of agriculture, livestock, water, and health sectors in climate adaptation, and includes some measures that may indirectly benefit nutrition, it does not operationalize or institutionalize these linkages. The absence of dedicated nutrition targets, financing, and integration with existing nutrition strategies reinforces the rationale for Level 2 classification.

The following measures can be taken to enhance the climate-nutrition integration:

- Introduce specific targets and programmatic linkages between climate-resilient agriculture and national nutrition outcomes (e.g., reduction in stunting, wasting, anemia).
- Include nutrition-sensitive climate indicators, such as dietary diversity scores, prevalence of undernutrition, and access to nutrient-rich crops in climate monitoring frameworks.
- Strengthen cross-sectoral alignment between the Ministry of Climate Change and national/provincial nutrition coordination bodies to embed nutrition objectives in climate action plans.
- Integrate climate-nutrition financing strategies into the policy's implementation mechanism, drawing from the Ecosystem Restoration Fund (ESRF) or GCF mechanisms.
- Expand the human health section to cover climate-induced malnutrition and foodborne illnesses, especially in disaster-prone and drought-affected areas.
- Use climate-resilient food systems as an entry point to enhance both adaptation outcomes and nutrition security, especially for vulnerable populations such as women and children.

National Disaster Management Plan (2025)[20]: The National Disaster Management Plan 2025 (NDMP-25) demonstrates integration between climate and disaster management. It outlines proactive disaster risk reduction measures including "strengthen infrastructure resilience" to withstand disasters (schools, hospitals, roads, etc.),and explicitly supports anticipatory planning through "Pre-arranged finance embodies the proactive measure of securing dedicated funds well in advance of potential disasters" disaster risk financing approach to reduce response time. Additional strategies such as "National Disaster Management Authority (NDMA) is also supporting pilot projects in various regions to test and refine anticipatory action approaches" for disaster risk reduction reflect a systemic approach to preparedness and coordination.

However, nutrition is largely absent as a prioritized domain within this framework. While some conceptual links exist, for example, the plan references that "2016 - 2017: Tharparkar (Sindh), Balochistan - 2.5 million - Crop failure, rise in malnutrition" and "2013 - 2014: Tharparkar (Sindh) - 1 million - famine like conditions, child malnutrition, livestock loss", and notes that "2022 Sindh, Balochistan 2.3 million - food insecurity, population displacement", these are limited to situational reporting rather than policy commitment.

There is no evidence of dedicated nutrition-specific programming, measurable nutrition indicators, or integration with national nutrition strategies. Furthermore, multiple nutrition-related aspects such as dietary shifts, food safety, macronutrient, and micronutrient have no relevant information in the document, indicating gaps in institutional and programmatic nutrition alignment. As such, while the NDMP-25 acknowledges vulnerability in food and health sectors, its lack of actionable integration places it at Level 2 on the climate-nutrition integration scale.

[20]Government of Pakistan. (2025). National Disaster Management Plan 2025. National Disaster Management Authority (NDMA).

The following measures can be taken to enhance the climate-nutrition integration:

- Explicitly include nutrition as a disaster risk dimension by integrating stunting, wasting, anemia, and dietary diversity as measurable indicators in the disaster risk V&A (e.g., Multi Hazard Vulnerability and Risk Assessment (MHVRA) system).
- Align NDMP with national nutrition policies, such as the Pakistan Multi-Sectoral Nutrition Strategy (PMNS) and the Adolescent Nutrition Strategy, to build joint implementation and monitoring systems.
- Establish institutional linkages between NDMA and the Ministry of National Health Services, and Food Security & Nutrition Clusters, ensuring cross-sectoral planning and financing for nutrition outcomes in emergency settings.
- Mainstream nutrition-sensitive messaging into community-based disaster preparedness and risk communication, especially targeting mothers, caregivers, and school systems.
- Promote climate-resilient and nutrition-dense food systems in hazard-prone districts by integrating agriculture, WASH, and social safety net interventions into DRM plans.

Climate and Health Vulnerability Assessment (2024)[21]: As per I-CAN Global Baseline Assessment report, "climate change and health V&As are surveys completed by national health authorities, in collaboration with other relevant ministries, seeking updated information on the health implications of climate change. They contain key information in areas such as governance, emergency preparedness, disease resilience, adaptation and mitigation measures, climate and health finance. These surveys are conducted every 3 years."

The CHVA identifies climate-nutrition-health linkages, explicitly stating that "weather and climate are the foundational drivers of healthy and sustainable diets" and acknowledging that "Poor nutrition outcomes and food insecurity are likely to be substantially aggravated by climate change, particularly… and in lower Sindh". It provides region-specific examples of vulnerabilities, including yield losses of staple food crops due to changing climate conditions.

Moreover, the assessment emphasizes severe health-related risks due to inadequate WASH conditions, stating clearly that "Waterborne diseases (WBDs) are likely to increase in response to the impact of climate changes on water quality, via temperature increases, flooding, and droughts" directly impacting nutritional and public health outcomes. To address these multifaceted challenges, the CHVA advocates health system strengthening, recommending early warning systems (EWS), integrated disease surveillance, and "No-Regrets" strategies for climate-sensitive diseases and further stresses the need to "explore smart agriculture and crop diversification" approaches to promote economic growth, improve food security, and nutrition. It also suggests implementing "community awareness campaigns" to inform and educate communities about health risks associated with climate change, recognizing the importance of public engagement in addressing climate-induced nutrition and health vulnerabilities.

However, the document does not provide dedicated nutrition-specific indicators, explicit funding streams for nutrition-climate integration, or clearly defined inter-ministerial coordination mechanisms. Thus, while the intention to integrate nutrition within the climate-health nexus is thoroughly articulated and robustly evidenced, the concrete implementation pathway remains underdeveloped, substantiating its current classification at Level 3.

[21]World Bank. (2024). Climate and Health Vulnerability Assessment: Pakistan. International Bank for Reconstruction and Development / The World Bank.

The following measures can be taken to enhance the climate-nutrition integration such as it can be enhanced to Level 4 by aligning nutrition programming with climate adaptation actions, especially in agriculture, food systems, and social protection sectors:

- Include explicit nutrition indicators (e.g., dietary diversity, stunting, wasting) in health surveillance systems and early warning mechanisms.
- Promote joint planning between the Ministry of Climate Change, MoNHSRC, and Ministry of Food Security, ensuring shared targets, budgets, and accountability frameworks.
- Expand the existing WASH and disease surveillance focus to include nutritional vulnerability mapping, especially in flood-prone, drought-affected, and food-insecure districts.
- Integrate "Food Systems Resilience" into the proposed National Risk Register and climate-health adaptation plans, linking agricultural outputs with community nutrition outcomes.

Climate Risk Country Profile (2021)[22]: The Climate Risk Country Profile clearly states that climate change exacerbates undernutrition and deprivation, especially among vulnerable groups like women, children, and the poor. It highlights how climate impacts will further stress the health and nutritional landscape. For instance, it notes that temperature increases are likely to place an increased burden on the health sector in Pakistan and exacerbate the impacts of food insecurity and undernutrition. The document further explains that "all of the above should be seen in the context of high and persistent levels of undernourishment", and in particular, the risks to women and children.

Moreover, it recognizes that "changes to Pakistan's rainfall and runoff regimes, and hence its water resources, are highly uncertain, but an increase in the incidence of drought conditions" patterns are likely to reduce the availability of water supplies for domestic use and agriculture, thereby impacting food production and hygiene, with downstream effects on nutrition. Despite this link, the profile does not propose any direct integration mechanisms between climate adaptation and nutrition-specific programming, such as improved dietary diversity, micronutrient security, or community-based malnutrition interventions. No institutional coordination frameworks or nutrition-sensitive indicators are outlined to align climate and nutrition goals.

Thus, while the profile document demonstrates conceptual awareness of climate-nutrition intersections, the absence of operational strategies, targets, and institutional mechanisms justifies its classification at Level 2 under the I-CAN framework.

The following measures can be taken to enhance the climate-nutrition integration:

- Explicitly integrate nutrition indicators (e.g., child stunting, wasting, food insecurity rates) into climate risk assessments, vulnerability mapping, and adaptation planning processes.
- Develop a Climate-Nutrition Vulnerability Index to inform priority setting for resilience investments, combining climate exposure data with nutrition outcomes.
- Embed nutrition-sensitive adaptation actions into sectoral climate resilience strategies, particularly in agriculture (e.g., resilient crop diversification, biofortified crops) and WASH sectors.

[22]Climate Risk Country Profile: Pakistan (2021): The World Bank Group and the Asian Development Bank.

- Promote cross-sectoral coordination by linking the Ministry of Climate Change, Ministry of Food Security, Ministry of Health, and Nutrition Coordination Cells to jointly implement climate-nutrition initiatives.
- Mobilize international climate financing for nutrition-sensitive resilience-building projects, targeting vulnerable districts most affected by climate risks and undernutrition (e.g., Balochistan, Sindh, KP-NMD).
- Enhance public communication strategies by integrating messaging on climate-resilient diets, the impact of climate change on nutrition, and community-based resilience solutions.

ii. Provincial Level

The study team reviewed the following climate documents at provincial level, and assigned them ratings:

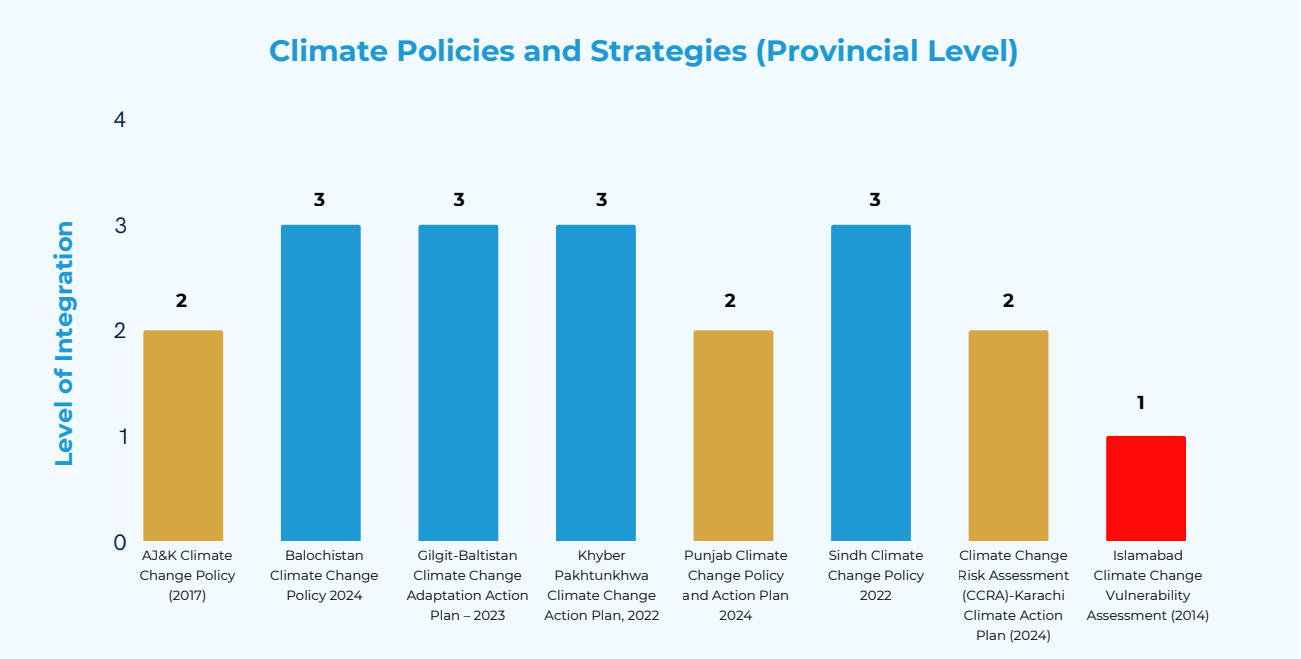


Figure 3. Climate Policies and Strategies at Provincial Level (Level of Integration)

Azad Jammu & Kashmir Climate Change Policy (2017)[23]: The Azad Jammu & Kashmir (AJ&K) Climate Change Policy 2017 reflects climate orientation, articulating detailed projections such as: "The average maximum and minimum temperature of AJ&K increased from 25°C and 12.0°C in 1962 to 27°C and 13.0°C in 2013" and anticipates a "1.4°C rise in 2060 and 3.0°C by end-century under IPCC RCP 4.5 scenario". These projections are translated into cross-sectoral climate adaptation and mitigation measures that address agriculture, forestry, water, energy, infrastructure, and disaster risk reduction. For instance, the policy pledges to "strengthen floods, including local flash floods, GLOF and drought forecasting, monitoring and early warning systems in the State".

From a nutrition-relevant perspective, the policy includes indirect linkages without explicit framing around nutrition outcomes. For example, it mentions the goal "to ensure water security, food security, energy security and economic security

[23]Government of Azad Jammu & Kashmir. (2017). AJ&K Climate Change Policy 2017. Climate Change Center, Planning & Development Department.

of the State", and outlines targeted socio-economic measures such as "providing interest-free loans to the poor, particularly women, to strengthen community-level climate change adaptation measures", and "developing renewable energy resources particularly microhydropower plants and provide cheap electricity to the poor". It further encourages improved governance and early warning mechanisms, stating the need to "establish linkage of Pakistan Meteorological Department with local communities... to provide information of disaster early warning and places for rescue timely to the poor".

Despite these acknowledgments of food security and vulnerability, the policy lacks any mention of core nutrition terms such as stunting, wasting, dietary diversity, or micronutrient deficiencies. It also does not align with national nutrition-specific frameworks such as the Multi-Sectoral Nutrition Strategy or include measurable nutrition indicators, targets, or budgeting.

The integration level therefore remains at Level 2, as defined by the I-CAN methodology, where nutrition is acknowledged only indirectly and not intentionally integrated. The policy recognizes climate impacts on vulnerable populations and food systems but does not embed nutrition as a strategic, measurable, or resourced objective within its climate planning and institutional mechanisms.

The following measures can be taken to enhance the climate-nutrition integration:

- The current policy broadly addresses food and water security but lacks explicit reference to nutritionspecific vulnerabilities and actions. It should incorporate climate-sensitive nutrition interventions, including targeting stunting, undernutrition, and maternal-child nutrition in vulnerable districts.
- While a climate action plan is suggested in Section 5.2, a dedicated nutrition-integrated adaptation plan, including short-, medium-, and long-term targets, should be developed to strengthen multisectoral collaboration.
- AJ&K Climate Change Policy highlights the need for climate data systems, but these are currently limited to meteorological and hydrological trends. It should now encourage integration of nutrition data into climate information systems.
- The policy should mandate regular V&A assessments integrating nutrition indicators to guide evidence-based planning for climate-resilient food systems and public health programming.
- The policy mentions mainstreaming climate change into other sectoral policies but does not guide on integration with the food system, agriculture, public health, or school feeding policies. Explicit crossreferencing with the National Nutrition Plan and FBDGs should be added.

Balochistan Climate Change Policy (2024)[24]: The Balochistan Climate Change Policy (BCCP) 2024 demonstrates strong intersectoral coordination and institutional mechanisms, including the Balochistan Climate Change Fund, BCCP Cell, and a Climate Finance Unit, aimed at mobilizing resources for climate action, including leveraging private and international funding. The policy prioritizes climate resilience in food systems by recognizing that "the agricultural sector, a cornerstone of Balochistan's economy, faces notable vulnerabilities. Climate change-induced shifts in rainfall patterns and temperature variations have substantial impacts on crop yields" and that this jeopardizes food security among households and vulnerable populations.

[24]Government of Balochistan. (2024). Balochistan Climate Change Policy 2024. Planning and Development Department.

Furthermore, it promotes climate-resilient infrastructure and low-carbon development by stating that “climate change is increasing the frequency and intensity of extreme weather events, such as flash floods, and heatwave”, necessitating the development of climate-resilient infrastructure and supports clean energy transitions under the commitment that “the policy promotes the adoption of clean and renewable energy sources” to reduce GHG emissions and diversify the energy mix.

Despite these advances, the policy falls short of Level 4 integration because nutrition remains an implicit rather than explicit outcome. There is no relevant information on different aspects of nutrition such as dietary shifts and diet-related, food safety, micronutrients, and food loss/waste reduction. Moreover, while the policy touches on public health and agriculture, it does not include any nutrition-specific targets, indicators, or implementation plans linked to national frameworks.

Hence, according to the I-CAN framework, the policy qualifies for “Level 3 - Intentional efforts to mobilize resources and planning frameworks that could benefit nutrition” but it does not reach Level 4 due to the lack of mainstreamed, measurable nutrition outcomes and institutional integration with national nutrition strategies.

The following measures can be taken to enhance the climate-nutrition integration:

- Establish dedicated nutrition-sensitive objectives in the agriculture, health, and food security sections, with Key Performance Indicators (KPIs) such as dietary diversity scores, child wasting/stunting rates, and prevalence of micronutrient deficiencies.
- Integrate the Pakistan Multisectoral Nutrition Strategy (2018-2025) and Adolescent Nutrition Strategy (20202025) explicitly within the provincial climate adaptation agenda to promote joint implementation plans.
- Develop climate-nutrition financing streams under the Balochistan Climate Change Fund and propose joint proposals to the GCF that address both food security and nutrition.
- Expand the WASH-health nexus to explicitly include nutrition outcomes, particularly in flood-prone, droughthit, and food-insecure districts like Chagai, Kalat, and Gwadar.
- Establish interdepartmental task forces involving the Health Department, Food Security institutions, and Climate Change Department to oversee the integration of nutrition into climate programming.

Gilgit-Baltistan Climate Change Adaptation Action Plan (2023)[25]: The Gilgit-Baltistan Climate Change Adaptation Action Plan (GB-CCAAP) 2023 demonstrates intentional efforts to link climate resilience with food security and nutrition-sensitive health outcomes. The plan explicitly addresses malnutrition risks by proposing to "strengthen preparedness and institutional response to reduce morbidity and mortality of infectious diseases and malnutrition attributed to climate change," while also emphasizing the need to "develop and implement strategies to facilitate access to health care services for early detection and treatment of infections," particularly for vulnerable populations. In the agriculture sector, it aims to "prepare Integrated Climate-Resilient Agriculture, Horticulture, Livestock, Rangelands and Fisheries Development Strategies" that could indirectly improve nutritional outcomes through diversified food production. The water management strategies, including measures to "design and implement measures for improved access to safe drinking water," further highlight the connection between climate adaptation and nutrition security.

Discussion with Government Official

[25]Government of Gilgit-Baltistan. (2023). Gilgit-Baltistan Climate Change Adaptation Action Plan 2023. Gilgit-Baltistan Environmental Protection Agency.

> *"Our focus is to train people to maximize the benefits from their land. By growing their own crops, they can improve their nutrition without relying on market purchases."*
>
> ***Discussion with Government Official***

However, while the plan identifies these critical intersections between climate action and nutrition, it lacks specific, measurable nutrition indicators to track progress. For instance, though it mentions monitoring "risk factors/behaviors, water and air quality, food safety, vectors, and malnutrition," it does not define targets or metrics for reducing malnutrition rates. The absence of dedicated climate-nutrition financing mechanisms or detailed cross-sectoral implementation frameworks also limits its comprehensiveness.

While the plan calls for a "whole-of-society approach" and coordination with entities like the NDMA, it does not outline concrete operational structures to ensure joint planning between health, agriculture, and climate sectors.

These gaps coupled with the lack of systematic budgeting for nutrition-sensitive interventions prevent the plan from reaching Level 4 integration under the I-CAN framework. Instead, its intentional but incomplete institutionalization of climate-nutrition linkages places it at Level 3, reflecting progress in policy recognition but remaining short of fully resourced, actionable strategies.

The following measures can be taken to enhance the climate-nutrition integration:

- Develop specific nutrition-sensitive adaptation targets, such as reduction in child stunting and wasting, improvements in dietary diversity, and micronutrient adequacy linked to climate resilience programs.
- Integrate climate-nutrition indicators into health surveillance and agricultural monitoring systems, including under the EWS for climate-induced disasters.
- Formalize cross-sectoral coordination between the Department of Health, Department of Agriculture, Gilgit Baltistan-Environmental Protection Agency (GB-EPA), and Disaster Management Authorities to jointly plan, implement, and monitor nutrition-sensitive climate actions.
- Mobilize climate-nutrition financing by aligning Gilgit Baltistan's (GB's) adaptation programs with GCF and Adaptation Fund frameworks that promote food and nutrition security.
- Promote community-based nutrition resilience projects, such as climate-resilient home gardens, indigenous food systems revival, and nutrition-sensitive WASH interventions in drought- and GLOF-affected areas.
- Expand public health campaigns to include messaging on the intersection of climate change and malnutrition, particularly targeting women, children, and marginalized mountain communities.

> *Heavy rain ruins ripe fruits, making them unsellable. Our traditional farming income is unstable now."*
>
> ***Focus Group Discussion with Female Community (GB)***

Focus Group Discussion with Female Community (GB)

Khyber Pakhtunkhwa Climate Change Action Plan (2022)[26]: The Khyber Pakhtunkhwa Climate Change Action Plan (KP-CCAP) 2022 is classified as Level 3 under the I-CAN framework, reflecting intentional but not fully operationalized integration of climate and nutrition linkages. The plan explicitly acknowledges nutrition vulnerability as an emerging climate risk, noting: "The agricultural sector was not immune to the consequences of these catastrophic events, which resulted in low crop production, disease, food insecurity, poverty and socioeconomic disadvantage." It further highlights how "Water stress will have a disproportionate impact on food security and agriculture in Khyber Pakhtunkhwa (KP)," and identifies specific threats such as "droughts and floods (which) play a significant part in the scarcity of potable drinking water."

While the KP-CCAP recognizes these risks, nutrition remains an indirect concern rather than a programmatic focus. For example, it mentions "Farmers frequently use pesticides in excess of their permitted limits due to lack of regulation and awareness," which indirectly impacts food safety and micronutrient security, but lacks targeted actions to address these issues. Similarly, the plan notes

"Damage to the agricultural sector has a serious impact on women's livelihoods, as women make up more than half of farm work," it does not propose gender-sensitive nutrition interventions despite women's critical role in food production and household nutrition.

The document suggests conceptual collaboration across sectors, such as linking agriculture and health through measures like "Include water, food hygiene and sanitation management in disaster preparedness and evacuation plans." However, it lacks concrete operational frameworks or joint actions such as specific targets for stunting reduction or dietary diversity and omits dedicated budgeting for nutrition-sensitive climate adaptation.

Institutional coordination is proposed broadly, with roles for the "Agriculture Department KP," "Health Department KP," and "Provincial Disaster Management Authority (PDMA) KP," but without clear mandates for cross-sectoral nutrition-climate programming. The plan also identifies health risks tied to

climate change, such as "Climate Change consequences (that) are expected to increase the intensity, frequency and severity of respiratory ailments, eye infections, gastrointestinal disorders, malaria, skin infections, heat strokes and mortality," but fails to connect these explicitly to malnutrition outcomes or preventive nutrition strategies.

Despite these gaps, the KP-CCAP lays groundwork for deeper integration, such as promoting "gender inclusiveness farming and awareness" and "Encourage and support farmers in developing cost-effective livestock feed." These measures, while not nutrition-specific, could be leveraged for future interventions. The absence of explicit, measurable nutrition indicators and dedicated financing mechanisms confines the plan to Level 3, underscoring the need for refinement to achieve actionable, system-wide alignment.

The following measures can be taken to enhance the climate-nutrition integration:

- Set nutrition-sensitive adaptation goals in agriculture, disaster management, and public health sectors (e.g., targets for stunting reduction, anemia control in climate-prone districts).
- Develop a cross-sectoral coordination mechanism linking the Departments of Climate Change, Health, Agriculture, and Social Welfare for climate-nutrition integration.

[26]Government of Khyber Pakhtunkhwa. (2022). Khyber Pakhtunkhwa Climate Change Action Plan 2022. Climate Change Cell, P&D Department.

- Introduce nutrition-sensitive indicators into climate monitoring frameworks (e.g., dietary diversity scores postdisaster, seasonal malnutrition mapping).
- Invest in climate-resilient nutrition interventions, such as promotion of drought-tolerant, nutrient-rich crops (e.g., millets, lentils) and resilient homestead gardens in vulnerable districts.
- Mobilize international climate and resilience finance (e.g., GCF, Adaptation Fund) for nutrition-sensitive adaptation projects in KP.
- Integrate nutrition awareness into climate resilience campaigns, targeting women, children, and rural communities with messaging on climate-resilient diets and food safety.

Punjab Climate Change Policy and Action Plan (2024)[27]: The Punjab Climate Change Policy and Action Plan 2024 highlights climate vulnerabilities related to food security, agriculture, and public health, incorporating a broad set of nutrition-relevant commitments. The policy explicitly notes "end all forms of malnutrition", and includes a wider health-nutrition nexus by stating: "Integrate appropriate measures of climate-related disasters and diseases in the health sector policy and plans" and "Incorporate health and environment in climate and disaster risk reduction related policies and vice versa".

On dietary quality, the policy recommends: "Prepare and disseminate a catalog of high-yielding, heatresistant, drought-tolerant and insect/pest-resistant crop breeds suitable for relevant agro-ecological zones through special programs".

Food safety is addressed with: "Introduce a soil health card system, associate it with subsidies offered to farmers". For improved nutritional content, it mandates to "ensure the use of controlled-release fertilizers that dissolve slowly for GHG emission reduction" and "Scale up and commercialize the production of climate-compatible crop varieties".

Food security measures are outlined under "develop district-level emergency relief action plans and funds with a gender lens to ensure that women and vulnerable groups receive timely and adequate support during climate-induced disasters", and "Launch during and post-disaster social protection schemes for poor population groups".

However, despite these commitments, the action plan lacks clearly defined nutrition-specific targets, indicators, timelines, or allocated budgets. There is no dedicated monitoring or inter-sectoral institutional coordination structure linking climate with nutrition outcomes. Consequently, while the policy includes strong intention and broad thematic coverage of nutrition, the absence of operational frameworks and resource planning restricts its classification to Level 2 under the I-CAN methodology.

The following measures can be taken to enhance the climate-nutrition integration:

- Explicitly integrate nutrition outcomes (e.g., stunting, wasting, micronutrient deficiency reduction) into climateresilient agriculture, health, and disaster risk management sectors within the policy and action plan.
- Align the Punjab Climate Change Action Plan with the Punjab Provincial Nutrition Strategy, PMNS, and other relevant nutrition policies to promote joint actions and reporting mechanisms.
- Develop district-level climate and nutrition vulnerability maps, integrating climate risk exposure (e.g., drought, floods, heatwaves) with malnutrition hotspots to target interventions more effectively.

[27]Government of Punjab. (2024). Punjab Climate Change Policy & Action Plan. Planning and Development Board, Punjab

- Incorporate nutrition-sensitive indicators into EWS for climate shocks and disaster preparedness plans (e.g., malnutrition rates post-disaster).
- Develop a cross-sectoral Climate-Nutrition Task Force within the Punjab Climate Change Policy Implementation Committee to ensure joint programming between climate, agriculture, health, and nutrition sectors.
- Mobilize climate financing (GCF, Adaptation Fund) to implement integrated climate-nutrition resilience projects, especially in high-risk districts like Rajanpur, Dera Ghazi Khan, Bahawalpur, and Cholistan areas.
- Mainstream climate-nutrition messaging into public awareness campaigns to promote climate-resilient dietary behaviors and food security at the community level.

Sindh Climate Change Policy (2022)[28]: The Sindh Climate Change Policy 2022 connects climate change to food security, malnutrition, and public health vulnerabilities, moving beyond to recommending adaptation actions with nutrition co-benefits. For instance, the policy states, "Climate change and variability will have significant impacts on food security and malnutrition" and highlights that "52.9% households in Sindh are food insecure". It also notes a critical impact on dietary quality: "There will be a reduction in the quality of micronutrients due to climate change, notably less protein and micronutrients in wheat and rice because of growing atmospheric carbon" of the food crops and depletion of vitamins and minerals content due to increased Carbon Dioxide (CO2). Moreover, "Nutrition policies can provide incentives for improving diets" and reduce the carbon footprint of food systems, revealing a clear awareness of the dual benefits of climate-nutrition integration.

Additionally, the policy recognizes the broader determinants of health and nutrition, mentioning that "Rapid urbanization, industrialization and transportation has resulted in deterioration of air quality in Sindh, resulting in severe respiratory and dermatological issues" and poor waste management practices are severely affecting the environment, leading to respiratory and water-borne diseases. The interlinkages between livelihoods, poverty, and food security are also highlighted: "Climate change directly or indirectly will continue to impact the overall economy of the agriculture sector" will result in job losses, reduction in Gross Domestic Product (GDP), reduction in agricultural productivity, damage to infrastructure and the social cost of climate change will exceed the current economic losses. These dynamics exacerbate nutrition-related vulnerabilities.

> *"Because of drought, our food is scarce. The crops are not ready on time.*
> *And the yield is very low."*
>
> ***Focus Group Discussion with Male Community (Sindh)***

Despite this awareness and cross-sectoral vision, the policy lacks systematic mechanisms to monitor stunting, wasting, dietary diversity, or anemia. While adaptation and mitigation priorities are stated such as "Construct structural barriers for the protection of communities residing in low lying coastal areas against the rising sea level to reduce the vulnerability of the population to the natural hazards by exposure reduction" and "suggested specific measures with key focus on mitigation, adaptation and capacity development processes for different sectors and sub-sectors like in agriculture, irrigation, forestry, industries, health, nutrition, education, energy, etc.-they are not clearly linked to nutrition outcomes. Furthermore, shortage of safe water and nutritional food is resulting in poor health outcomes, especially among children and women is stated "Shortage of safe water and nutritional food also gives rise to numerous disease." Besides, no dedicated institutional frameworks or budgeted plans are outlined to resolve this.

[28]Government of Sindh. (2022). Sindh Climate Change Policy 2022. Sindh Environmental Protection Agency.

Institutional responsibilities and coordination mechanisms between climate, agriculture, and nutrition actors are acknowledged in principle, but remain un-operationalized in terms of detailed implementation roadmaps or financing frameworks. Therefore, while the policy demonstrates intention and partial integration, the absence of measurable indicators, programmatic tools, and institutional coordination justifies its placement at Level 3 of climate-nutrition integration.

The following measures can be taken to enhance the climate-nutrition integration:

- Integrate nutrition-specific outcomes (e.g., stunting reduction, improved dietary diversity, reduced wasting) within the climate resilience and disaster preparedness sections, with measurable KPIs.
- Align the Sindh Climate Change Policy with existing provincial and national nutrition frameworks, such as the PMNS and Sindh Nutrition Strategy, ensuring joint implementation mechanisms.
- Establish a cross-sectoral Climate-Nutrition Coordination Committee, involving Environment, Health, Agriculture, and Social Welfare departments, with dedicated funding streams.
- Embed nutrition indicators into climate risk assessments, EWS, and climate vulnerability mapping across Sindh, particularly targeting districts prone to droughts and floods.
- Mobilize climate financing (e.g., GCF, Adaptation Fund) for integrated climate-nutrition projects, such as resilient food systems, nutrition-sensitive social protection programs, and localized food fortification initiatives.
- Enhance climate-nutrition communication campaigns, promoting climate-resilient dietary behaviors and sustainable nutrition practices at community level through Behavior Change Communication (BCC).

> *"Punjab covers 60-65% of wheat production and Sindh contributes 30-35%. These two areas are the most important for our national food and nutrition security. Therefore, any disruption in these regions significantly impacts dietary outcomes."*
>
> ***Discussion with Academia***

Climate Change Risk Assessment (CCRA)-Karachi Climate Action Plan (2024)[29]: The Climate Change Risk Assessment (CCRA) for Karachi under the Karachi Climate Action Plan (K-CAP) is classified as Level 2 under the I-CAN framework, indicating some intention to connect climate and nutrition but lacking full programmatic integration. The assessment explicitly recognizes climate-induced vulnerabilities that impact food and health security, noting: "The prevailing socio-economic conditions have already made a vulnerable population, and this vulnerability has been further exacerbated due to extreme climatic events, like heatwaves, flooding, and drought/water stress." It highlights how "Solid waste mismanagement is a contributing factor to urban flooding, affecting the food supply chain and storage systems due to waterlogging and spoilage," and identifies "Lack of cold storage and temperature-controlled logistics facilities" as a key driver of food loss.

Health risks tied to malnutrition are also documented, such as "The high incidence of air, land, and water pollution resulting from poor waste management, vehicular pollution, and industrial wastes, cause a high rate of diseases in the residents of Karachi." with specific examples like "diarrhea,

[29]Government of Pakistan. (2024). Climate Change Risk Assessment: Karachi City – K-CAP. The Urban Unit, C40 Cities, and UNDP Pakistan.

skin infections, and flu" plaguing vulnerable communities. The report further links climate shocks to nutrition access, stating: "Access to safe drinking water is a continuous struggle for the resident of Rerhi Goth," where contaminated water (costing Rs. 3,200-3,500 per 5,000 gallons) leads to "gastrointestinal and kidney diseases."

However, while the CCRA identifies these intersections, it lacks explicit nutrition-sensitive actions or targets. For instance, it notes "Health and nutrition issues in most vulnerable groups leading to increased burden on health sector," but omits measures to address dietary diversity, micronutrient deficiencies, or stunting. Institutional coordination is mentioned broadly (e.g., "Karachi Metropolitan Corporation," "Sindh Solid Waste Management Board"), still no cross-sectoral frameworks link climate adaptation to nutrition outcomes.

The following measures can be taken to enhance the climate-nutrition integration:

- Explicitly integrate nutrition outcomes (e.g., stunting, wasting, dietary diversity, food insecurity levels) into the risk assessments and adaptation strategies of the K-CAP.
- Develop climate-nutrition vulnerability maps for Karachi by overlaying malnutrition prevalence data with climate exposure hotspots (urban heat islands, flood zones, drought-prone communities).
- Integrate nutrition-sensitive indicators into monitoring frameworks, EWS, and disaster response protocols.
- Align climate adaptation programs with national nutrition strategies (e.g., Pakistan Multi-Sectoral Nutrition Strategy, provincial nutrition programs) to achieve dual resilience and nutrition outcomes.
- Mobilize climate financing for nutrition-sensitive adaptation projects, targeting vulnerable groups living in informal settlements, coastal areas (like Rehri Goth, Ibrahim Hyderi), and low-income urban neighborhoods.
- Strengthen institutional collaboration between Karachi Metropolitan Corporation (KMC), Sindh Food Authority, Ministry of Health, and Department of Climate Change to design joint climate-health-nutrition interventions.

Islamabad Climate Change Vulnerability Assessment (2014) [30]: The Islamabad Climate Change Vulnerability Assessment 2014 is classified as Level 1 under the I-CAN framework, reflecting no intention of climate and nutrition integration. This V&A provides a focused and data-rich overview of climate hazards, exposure, and sensitivity across Islamabad's urban landscape, emphasizing water stress "Similarly, droughts are affecting food production in rural areas, which impacts urban populations, especially poorer and marginalised communities", urban flooding "Already the frequency and intensity of urban floods is increasing, due to higher and more intense rainfall as well as poor drainage and degraded or destroyed waterways in urban areas", infrastructure "In many cities, public services and infrastructure are heavily strained, urban ecosystems are polluted, streets are congested and informal settlements are widespread", and socioeconomic vulnerability "In many urban areas, climate change is already exacerbating and compounding existing inequalities, vulnerabilities and socio-economic development challenges". However, it does not mention nutrition, malnutrition, food security, or dietary diversity anywhere in the assessment, as "Starting with a brief background of the city, this report addresses Islamabad's climate change situation from a comprehensive vulnerability

[30]Capital Development Authority / UN-Habitat. (2014). Islamabad, Pakistan: Climate Change Vulnerability Assessment. United Nations Human Settlements Programme (UN-Habitat).

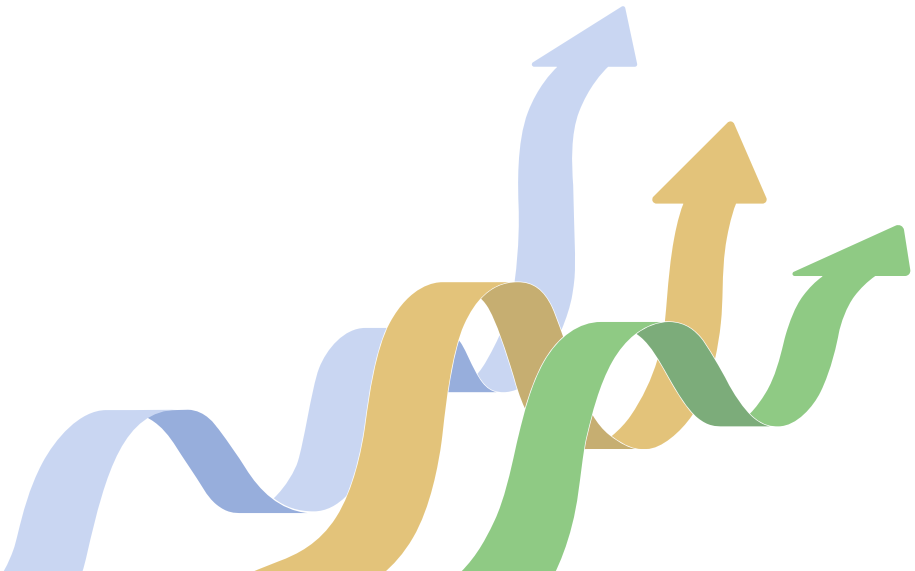
perspective that focuses on exposure to climate change hazards, socio-economic sensitivities and the adaptive capacities of the city and its stakeholders". Health is only mentioned in the context of climate-sensitive disease risks (e.g., vector-borne illnesses) - "The increasing number of respiratory, skin and eye diseases, as well as waterborne diseases, such as diarrhoea, malaria and dengue, in Islamabad suggest the increasing impact of climate change on human health" - and there is no evidence of nutrition data, actors, or action pathways. The report's risk framework does not incorporate nutrition-sensitive indicators, and no departments or agencies related to food or nutrition are consulted or referenced.

The following measures can be taken to enhance the climate-nutrition integration:

- Link climate-resilient agriculture initiatives to Islamabad's nutrition outcomes (e.g. reduced child stunting or anemia in vulnerable communities).
- Add metrics like dietary diversity scores, underweight prevalence, or access to nutrient-rich crops in Islamabad's
- Create formal ties between the Ministry of Climate Change (and ICT authorities) and nutrition coordination bodies (e.g. health and planning departments) to align objectives and activities.
- Integrate nutrition objectives into Islamabad's climate financing strategies, leveraging funds like the ESRF or Green Climate Fund for nutrition-sensitive projects.
- Climate and development reporting.

3.2 NUTRITION POLICIES AND STRATEGIES

Pakistan's nutrition policy landscape demonstrates a growing recognition of the inter-linkages between food security, dietary diversity, and broader development priorities; however, explicit integration of climate considerations remains uneven. The study team reviewed key national documents including the Pakistan National Food Security Policy (2018), the Pakistan Multi-Sectoral Nutrition Strategy (20182025), the Pakistan Adolescent Nutrition Strategy and Operational Plan (2020-2025), the Pakistan Dietary Guidelines for Better Nutrition (2019), and the National Pathways for Food Systems Transformation (2021) and assessed their alignment with climate-nutrition objectives under the I-CAN framework. While several policies show strong intent by promoting diversified food systems, fortified crops, and crosssectoral coordination, most fall short of translating into climate-responsive action plans with measurable nutrition outcomes. This section synthesizes those findings, highlighting both achievements and critical gaps in linking nutrition strategies to climate resilience at the national level.



i. National Level

The study team reviewed the following nutrition documents at national level, and assigned them ratings:

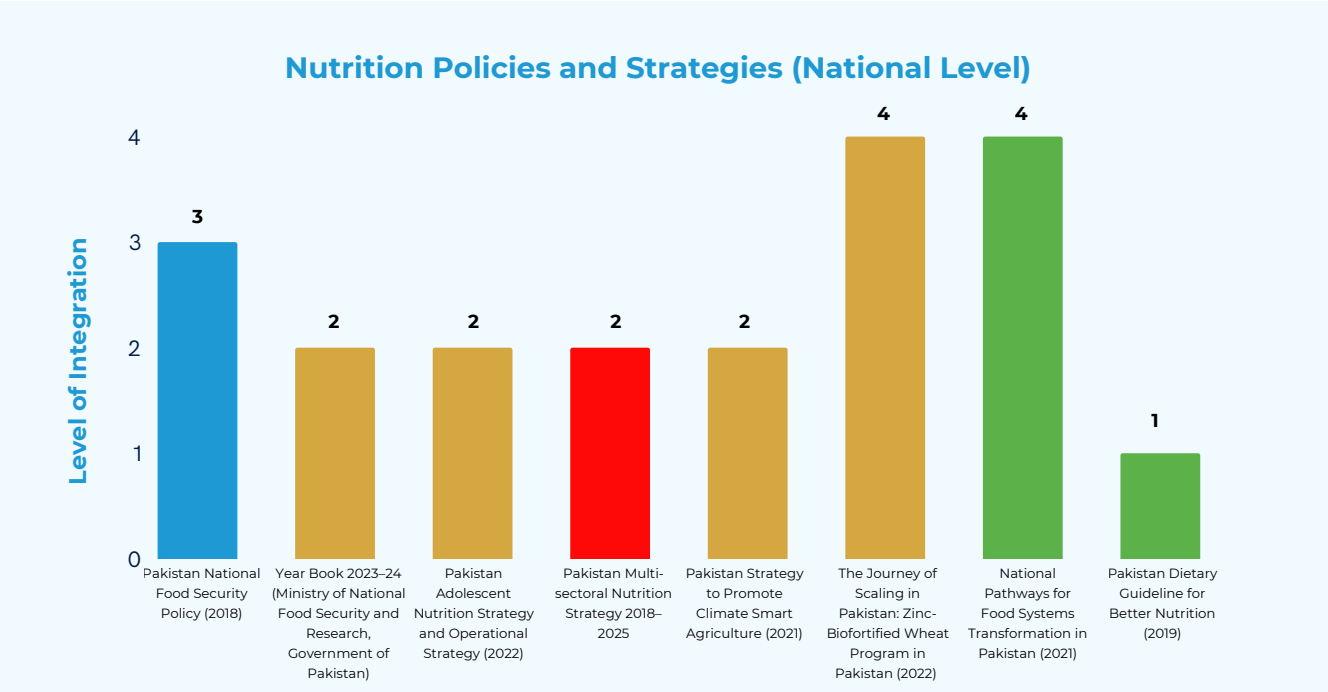


Figure 4. *Nutrition Policies and Strategies at National Level (Level of Integration)*

Pakistan National Food Security Policy (2018)[31]: The Pakistan National Food Security Policy (2018) explicitly acknowledges the direct impact of climate change on agricultural productivity, food availability, and nutritional quality, stating that "increased climate variability and extreme weather events are negatively impacting food stability, food production, and livelihoods of farmers and vulnerable peoples."

It further links climate risks to malnutrition by highlighting how "droughts in dry areas, coastal belts, salt ranges, and desert ecologies can affect sweet water availability," threatening communities with "malnourishment and scarce clean water." The policy outlines concrete climate adaptation measures, such as "developing early warning systems for extreme climate events" and "promoting climate-smart agriculture practices with maximum water productivity," demonstrating a clear recognition of the climate nutrition nexus.

To address these challenges, the NFSP proposes strategic interventions requiring resource mobilization, including "developing new fortified cultivars of crops rich in micronutrients," "promoting food fortification for wheat flour, oil, and salt," and "implementing Zero Hunger Programs" through collaboration with stakeholders like provincial governments, UN agencies, and the private sector. The policy emphasizes diversified food systems to improve nutrition, noting that "for balanced food intake, there is a need to focus on production of diverse foods, i.e., vegetables, fruits, nuts, oilseeds, pulses, and livestock products," which contribute significantly to dietary energy and nutritional security. It also prioritizes education, with "media campaigns about national dietary guidelines" and "improved nutrition literacy programs," targeting both farmers and consumers.

> *"If you go towards crop diversification, you will generate alternate avenues in terms of the economic benefits... and that will also ensure food security... different sources... in terms of nutrition."*
>
> ***Discussion with Development Organization***

[31] Government of Pakistan. (2018). National Food Security Policy 2018. Ministry of National Food Security and Research.

However, while the policy demonstrates strong intent through cross-sectoral coordination, engaging health, education, and agriculture sectors, it lacks detailed, costed plans for climate-nutrition integration. For instance, despite advocating for "climate-resilient crops" and "organic farming certification," it does not specify budget allocations or timelines for these initiatives.

> *Pakistan's policy framework should evolve to explicitly link climate change and nutrition objectives. For example, climate change policies should incorporate nutrition targets... The National Food Security Policy should address how to protect food systems and essential nutrition services in the face of climate variability and extremes."*
>
> ***National Stakeholder Workshop***

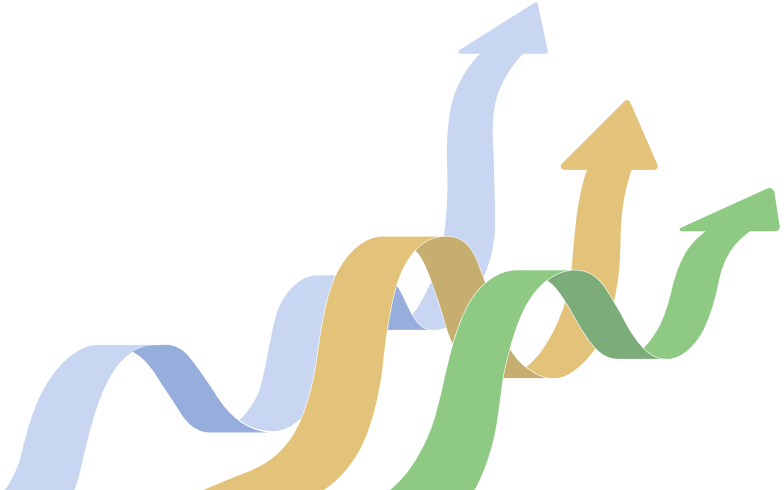
Similarly, while it identifies "post-harvest losses in perishables as high as 22 percent," proposed solutions like "advanced Controlled Atmosphere Storage" remain conceptual without financial frameworks.

> *GAIN is addressing post-harvest losses, such as dairy wastage in Punjab and fruit wastage in GB, by working with local producers."*
>
> ***Discussion with GAIN***

This gap between strategic vision and actionable, resourced plans limits the policy to Level 3 under the ICAN framework, reflecting intentional but incomplete integration of climate and nutrition goals.

The following measures can be taken to enhance the climate-nutrition integration:

- Set Specific and Measurable Nutrition Targets Related to Climate Actions: Need to define clear, measurable goals that link climate adaptation with nutrition outcomes e.g.
- Develop and Implement Cross-Sectoral Action Plans to establish coordinated programs between agriculture, climate, and health ministry's e.g. Launch an integrated "Climate-Smart Nutrition Village" model in Sindh, combining solar-powered irrigation, biofortified crops, water sanitation, and local nutrition counseling and create joint task forces between the Ministry of Climate Change and MNFSR to implement Zero Hunger initiatives in climate-vulnerable regions.
- Mobilise and Allocate Budgets for Integrated Programs and dedicate climate finance for nutrition-sensitive agriculture and food systems, e.g. Earmark 10% of NAP budget for nutrition-focused actions like droughttolerant kitchen gardens and clean drinking water access. Establish climate-nutrition project pipelines and seek co-financing from GCF, International Fund for Agricultural Development (IFAD), World Food Programme (WFP), and other development partners.
- Strengthen Monitoring and MRV Systems, Incorporate nutrition indicators (e.g., minimum dietary diversity, food security, child growth monitoring) into MRV frameworks. Regularly assess and publish joint climate and nutrition progress reports.



Year Book 2023-24 (Ministry of National Food Security and Research, Government of Pakistan)[32] [33] : Year Book 2023-24 by the MNFS&R demonstrates conceptual awareness of climate threats to food systems, emphasizing the need to sustain food production for national security, as evidenced by initiatives like "Building Drought Resilience through Integrated Land-Water-Range-Livestock Management in Fragile Ecologies" and the "Formulation of next-generation Climate Resilient Indigenous Rhizobia-PGRP based Biofertilizer for Yield enhancement of Soyabean." The report also highlights efforts to strengthen agricultural resilience, such as the "PSDP project (2020-2023) re-delineating the country's agro-ecological zones" and promoting "desiccant-assisted solar dryers to efficiently remove moisture from fruits," addressing climate-induced challenges like unpredictable weather.

However, integration remains limited to food security, lacking linkages to nutrition outcomes. While the document notes "six million people in Pakistan are facing acute food insecurity" (World Bank, 2023) and examines household nutrient consumption patterns such as "Iron, Zinc, Vitamin A, and Iodine intake below the recommended daily allowance (RDA) in all provinces" and it does not embed nutrition-specific indicators into climate adaptation frameworks. There is no direct collaboration with health sectors or malnutrition monitoring, despite acknowledging dietary gaps like "Beta-carotene consumption being highest in urban Punjab (1.41mcg) and lowest in rural Sindh (0.02mcg)." Programmatic interventions focus on production (e.g., Advancing Agricultural Mechanization and Arable Land Management) and waste reduction (e.g., Converting organic Waste Materials into Value-added Bio-compost at National Agricultural Research Center (NARC)), but fail to connect these to nutritional improvements.

Although the report recognizes "unhealthy dietary practices contribute to malnutrition, child mortality, and economic losses," it lacks actionable strategies to align climate resilience with nutrition security, such as targeted dietary diversification or fortified crop programs. Stakeholder engagement is similarly siloed, involving agricultural bodies like Pakistan Agricultural Research Council (PARC) and Pakistan Agricultural Storage and Services Corporation (PASSCO) but omitting health or nutrition agencies. Consequently, while the Year Book 2023-24 shows intent to address climate-food security linkages, earning its Level 2 classification under the I-CAN framework and it falls short of the cross-sectoral policies or nutritionsensitive metrics required for higher integration.

The following measures can be taken to enhance the climate-nutrition integration:

- Expand food security frameworks (e.g., Food Security Dashboard, Essential Agriculture Food Commodities Monitoring Cell) to include nutrition-sensitive indicators such as household dietary diversity, child wasting and stunting rates, and micronutrient deficiencies.
- Align agricultural resilience programs (e.g., corporate farming, high-value crops, CSA initiatives) with national nutrition strategies to deliver co-benefits in both food availability and dietary improvement.
- Develop a Climate-Nutrition Risk Monitoring System that maps agricultural, climatic, and nutritional vulnerabilities together for disaster-prone and food-insecure regions.
- Promote climate-resilient nutrition programs by supporting production and local consumption of nutrient-rich, drought- and flood-resilient crops such as millets, lentils, chickpeas, and indigenous vegetables.
- Incorporate nutrition-sensitive objectives and KPIs into Public Sector Development Programs (PSDP) and provincial agriculture and livestock development plans.

[32]The Year Book 2023–24, published by the Ministry of National Food Security and Research (MNFS&R), Government of Pakistan, is an official annual report that outlines the ministry's performance, key achievements, and future plans during the fiscal year. This publication serves as an important reference for policymakers, researchers, and the general public. The document highlights Pakistan's robust agricultural growth. It also reflects the ministry's efforts to ensure national food security, promote economic resilience, and support rural livelihoods.

[33] Ministry of National Food Security & Research, Government of Pakistan. (2025). Year Book 2023–24. Economic Wing, Ministry of National Food Security & Research.

Pakistan Adolescent Nutrition Strategy and Operational Strategy (2022)[34]: The Pakistan Adolescent Nutrition Strategy and Operational Plan (2020-2025) primarily addresses malnutrition among adolescents through nutrition-specific interventions, such as "multi-micronutrient supplementation can reduce anemia by 31%" and school-based programs like "micronutrient supplementation and deworming and promoting healthy diets through cooking demonstrations and awareness sessions." It also incorporates nutrition-sensitive approaches, including WASH improvements ("ensure access to safe drinking water and adequate sanitation facilities in schools") and agricultural training ("train agriculture extension workers on food preservation and prevention of food, water and vector-borne diseases"). The strategy emphasizes a food systems lens, advocating for policies to "regulate marketing of unhealthy foods and beverages" and "prohibit unhealthy snacks, energy drinks, and sale of soft drinks on school premises," while addressing systemic barriers like "poverty, maldistribution of food, lack of nutritional knowledge, low literacy, and poor health services " that limit access to healthy diets.

However, the strategy fails to integrate climate-related risks, such as droughts or floods that exacerbate food insecurity and malnutrition, particularly for vulnerable groups like "adolescents in rural areas, where more than half of households are food insecure for most of the year." Despite acknowledging "poor access to adequate, safe, and healthy food" as a driver of malnutrition, it omits climate-smart agriculture, adaptation measures, or resilience-building against climate shocks. For instance, while it promotes "skills development for food processing and value addition to decrease postharvest losses," it does not link these efforts to climate resilience or sustainable resource management. Similarly, WASH initiatives ("safe water, hygiene, and sanitation facilities in schools and other public institutions") are framed as standalone solutions rather than part of a climate-aware strategy.

The document's limited engagement with climate-nutrition linkages, restricted to indirect measures like postharvest training and WASH places it at Level 2 of the I-CAN framework. It demonstrates intent to improve food systems (e.g., "raising awareness of balanced diets and dietary diversity") but lacks explicit climate adaptation objectives, monitoring of climate-vulnerable populations, or cross-sectoral coordination with environmental agencies.

> *Wherever we plan any intervention, it is very necessary to take proper integration and onboarding of stakeholders... Things should move forward with collective wisdom and a collective vision."*
>
> ***Discussion with Government Official***

This partial alignment reflects a missed opportunity to address compounding risks, such as iron deficiency anemia worsening due to climate-induced crop failures or household food insecurity escalating after extreme weather events. Without such integration, the strategy falls short of a holistic approach to safeguarding adolescent nutrition in a changing climate.

The following measures can be taken to enhance the climate-nutrition integration:

- Explicitly frame nutrition challenges in the context of climate risk, e.g., food insecurity from floods, adolescent undernutrition in drought zones, etc.
- Incorporate climate vulnerability data (e.g., disaster risk zones, heat-prone areas, water-scarce districts) into targeting and prioritization for adolescent programs.
- Embed adolescent nutrition indicators in climate-related monitoring frameworks, including in disaster preparedness and recovery programs.

[34]Government of Pakistan. (2022). Pakistan Adolescent Nutrition Strategy 2022–2030. Ministry of Planning, Development & Special Initiatives and UNICEF.

- Link adolescent-focused WASH and health programming with climate resilience funds (e.g., GCF, Adaptation Fund) to expand coverage and improve infrastructure in disaster-prone areas.
- Promote climate-resilient food environments, including sustainable school meal programs and kitchen gardens in vulnerable communities.
- Scale up behavior change strategies to educate adolescents on climate-resilient diets and sustainable consumption practices.

> *"GAIN is working with provincial governments to ensure that (school meal) programs follow a systematic approach, with clear standards and recipes to improve child and youth nutrition."*
> ***Discussion with GAIN***

Pakistan Multi-Sectoral Nutrition Strategy 2018-2025)[35]: As per I-CAN Global Baseline Assessment report, "NNPs are a set of country documents which outline the intended actions and goals to improve the nutritional status of their populations. This can be in the form of a policy document, action plan or strategy. For this analysis, action plans or strategies were used over policy documents where available.

The PMNS 2018-2025 acknowledges the importance of resilience and disaster management, explicitly stating: "Support for resilience: to establish stronger healthier population to better endure humanitarian emergencies and to have an impact of undernutrition, it is important to pursue resilience-centered policies in key sectors." It promotes nutrition-sensitive interventions in climate-vulnerable sectors, such as agriculture, where it calls for "implementing drought management and mitigation" and "adopting crops with improved nutrient content" to enhance food security. The strategy also links WASH (water, sanitation, and hygiene) to nutrition outcomes, noting: "Diarrhea, one of the immediate causes of malnutrition, is largely preventable through access to safe drinking water and basic sanitation."

However, while the PMNS identifies climate-sensitive actions such as "boosting agricultural production and distribution" to counter shocks like droughts it lacks a systematic operational plan to connect climate adaptation with nutrition outcomes. For instance, though it mentions "resilience-centered policies," there are no dedicated climate-nutrition targets, such as reducing stunting or anemia in climate-vulnerable regions. The strategy also omits explicit framing of climate risks (e.g., erratic rainfall, heat stress) as direct drivers of malnutrition, despite noting that "58% of households are classified as food insecure" and "97% of children in urban areas suffer from micronutrient deficiencies."

Resource mobilization for climate-nutrition integration is limited. While the PMNS emphasizes "Coordinate national resource mobilization for multi-sectoral nutrition interventions," it does not allocate specific funding or metrics to track climate impacts on nutrition. Similarly, institutional coordination such as involving "PDMAs" is mentioned but without clear mandates for joint climate-nutrition programming.

Thus, the PMNS demonstrates Level 2 integration under the I-CAN framework: it recognizes crosssectoral linkages (e.g., agriculture, WASH) and resilience-building but stops short of actionable, measurable climate-nutrition strategies.

A comparison of Pakistan PMNS with a global best practice NNP is provided below:

[35]Government of Pakistan. (2018). Pakistan Multi-Sectoral Nutrition Strategy 2018–2025. Ministry of Planning, Development & Reform.

Table 4: Pakistan PMNS in Comparison with Best Practice NNP

Key Element	Ethiopia NNP (Best Practice)	Pakistan PMNS (2018-2025)	Gap/Comment for Pakistan
Holistic Food Systems Approach	Emphasizes full valuechain: production, postharvest management, household diets, policies, private sector, and community systems	Focuses mostly on sectoral interventions (health, agriculture), limited value chain or systems framing	Missing comprehensive food systems framing
Integration with Climate Action	Environmental sustainability included in NNP; climate-resilient agriculture, food loss reduction, and water management linked to nutrition	Climate considerations largely absent or peripheral	No climate-nutrition lens currently adopted
SMART Objectives with KPIs	Includes clear targets, indicators, data sources, and responsible ministries across multiple sectors	PMNS lacks specific KPIs; general strategic direction without measurable targets	Weak accountability and tracking mechanism
Unified Data and Information System	Plans a central Unified Food and Nutrition Information System (UNIS) with triangulated sectoral data	Relies on fragmented sectoral reporting, lacks centralized system for food-nutrition data	Missing integrated platform for real-time, multi-sectoral nutrition data
Institutional Capacity Building and Sectoral Planning	Nutrition integrated into sectoral workplans; each sector trained to collect/use data; regular sectoral reviews	General coordination mentioned, but limited evidence of capacity building across all sectors	Weak sectoral ownership and skills in nutrition planning
Shock-Responsive Nutrition and Emergency Preparedness	Strategic Objective on managing food/nutrition emergencies, including displaced populations	Limited focus on emergencies or resilience in PMNS; mostly focused on development nutrition	No clear linkage with disaster risk reduction or emergency nutrition programming
Nutrition Literacy and Behavioral Change	Emphasizes improving nutrition literacy across the value chain through Social and Behavior Change Communication (SBCC) and education	Focused more on service delivery than long-term behavioral change	Community-level education and awareness components are underdeveloped
Sustainable Financing and Private Sector Engagement	Calls for diversified financing (public, private, donors), innovative mechanisms	Private sector mentioned in passing; financing mostly depends on donor-funded projects	No sustainable financing framework

The following measures can be taken to enhance the climate-nutrition integration:

- The following measures can be taken to enhance the climate-nutrition integration:

- Strengthen explicit linkages between climate vulnerabilities (e.g., droughts, floods) and specific nutrition targets (e.g., reduction in stunting, anemia) in monitoring and evaluation frameworks.
- Encourage provinces to align their nutrition implementation plans with localized climate-risk profiles, especially for drought- and flood-prone areas.
- Enhance resource mobilization for integrated climate-nutrition programming by leveraging international climate finance opportunities (e.g., GCF, Adaptation Fund).
- Operationalize the Nutrition Lens more aggressively by embedding climate indicators into sectoral annual development plans (ADPs) and tracking their nutrition co-benefits.
- Strengthen partnerships with climate-focused ministries and institutions, ensuring that agriculture, disaster risk management, environment, and public health sectors jointly develop climate-resilient nutrition-sensitive interventions.
- Integrate nutrition preparedness and response measures into climate and disaster-resilience frameworks..

Pakistan Strategy to Promote Climate Smart Agriculture Practices (2021)[36]: As per I-CAN Global Baseline Assessment report, "Climate-smart nutritious foods have benefits for both positive climate and nutrition impacts, with these types of crops more resilient to extreme weather events. Nutrient-rich foods tend to be more resilient to climate threats, including droughts, pests and crop diseases, and temperature changes. This is a win-win situation. NUS, as the name suggests, are crops which have high nutritional potential but are underutilized in food systems. Fortified and biofortified crops are specifically enriched or bred with essential nutrients. Both these crop types play a key role in improving nutrition. Staple foods include foods such as wheat, rice and maize, which are currently the three most grown and consumed crops in the world. Intensive farming for these crops leads to not only a high output of emissions, but also a reduction in diet quality and diversity."

The study team conducted an in-depth assessment of the Pakistan Strategy to Promote Climate Smart Agriculture Practices to evaluate the extent of climate-nutrition integration based on criteria outlined in this report. The strategy, while robust in climate resilience and agricultural transformation, aligns with Level 2 of integration-indicating some intention to connect climate action with nutrition outcomes.

This classification stems from the strategy's strong emphasis on promoting agricultural productivity, water efficiency, technological innovation, and institutional capacity building in response to Pakistan's escalating climate risks. The document presents a wide portfolio of CSA interventions, including: "watersmart agriculture practices (e.g., raised bed planting, alternate wetting and drying in rice), weathersmart activities (e.g., ICT-based agro-met services, stress-tolerant crops), nutrient-smart practices (e.g., precision fertilizer application), carbon and energy-efficient techniques (e.g., zero tillage), and institutional/market-smart approaches (e.g., cross-sector linkages, gender strategies, financial services)".

The strategy also recognizes the vulnerability of Pakistan's diverse agro-ecological zones to climaterelated hazards such as floods, droughts, and extreme heat. It recommends "resilient cropping systems (e.g., mungbean-wheat, soybean-wheat), drought-tolerant varieties in rain-fed areas," and "development of improved and new seed varieties to withstand changing climate conditions".

[36]Rana, A. W., & Gill, S. (2021). Pakistan: Strategy to promote climate smart agriculture practices. International Food Policy Research Institute. Funded by the Consortium for Scaling-up Climate Smart Agriculture in South Asia.

Additionally, it highlights efforts to support farmers through EWS, credit and insurance access, and institutional reforms under devolved provincial governance structures.

> *"Government and development sector need to hand-hold the farmers... to improve knowledge flow"*
>
> ***Discussion with Government Official***

However, the strategy falls short in systematically integrating nutrition goals or addressing dietary outcomes. While food security and agricultural productivity are recurring themes, the document does not reference key nutrition concepts such as nutrition-sensitive agriculture, dietary diversity, or micronutrient enhancement. Furthermore, despite proposing a MEL framework, none of the performance indicators focus on nutrition outcomes. The strategy notes that: "Each project must have a performance matrix comprising of multiple indicators... such as number of farmers reporting improved crop productivity and increases in yield and income", but does not mention metrics such as Minimum Dietary Diversity Score or household food consumption.

The health and nutrition sectors are notably absent as partners in strategy design or implementation. There is no proposed collaboration with the Ministry of National Health Services, nutrition alliances, or institutions such as GAIN. This limits the potential of CSA interventions to contribute to improved nutrition outcomes. Moreover, while the document includes cross-cutting themes such as gender equality, social inclusion, and marginalized communities, the absence of nutrition-related planning reduces the scope for food system transformation that delivers health co-benefits.

The Pakistan CSA strategy demonstrates a technical and productivity-centered orientation. It lacks the institutional coordination, budgetary allocation, and outcome indicators necessary to reach Level 3 or 4 integration, where nutrition is systematically embedded in climate action.

To achieve a Level 4 classification, information available on existing data portals (e.g., Food Systems Dashboard) must be enhanced to better support climate-nutrition integration The CSA strategy should explicitly include nutrition-sensitive goals by promoting neglected and underutilized species (NUS) such as millets and pulses, as well as biofortified crops like zinc-enriched wheat. This would not only enhance dietary diversity but also support climate-resilient food systems.

- Provincial CSA action plans should incorporate nutrition-focused cropping patterns in rainfed and climateaffected zones. These could build upon existing resilient systems (e.g., mung-wheat, soybean-wheat) and expand to include fortified staples and NUS for nutrition enhancement.

- The MEL system should be revised to include metrics such as Minimum Dietary Diversity Score (MDDS), household food consumption patterns, uptake of biofortified crops, and percentage of women and children with improved dietary intake. This would allow tracking of both agricultural and nutrition outcomes.

- The Ministry of National Health Services, Ministry of Food Security and national nutrition coordination platforms should be engaged in co-designing CSA projects with dual climate and nutrition objectives. Multisectoral planning will help embed nutrition within climate-resilient agriculture.

- Farmer education platforms should promote the nutritional value of climate-smart crops. Public campaigns across rural radio, local TV, and social media can raise awareness of health benefits associated with NUS and fortified staples, linking nutrition to CSA practices.

- Future climate finance proposals should position nutrition as a co-benefit of CSA interventions. Funding windows like the Green Climate Fund and domestic CSA programs should be tapped to scale up value chains for nutrient-dense crops and to build institutional capacity for climate-smart nutrition planning

The Journey of Scaling in Pakistan: Zinc-Biofortified Wheat Program in Pakistan (2022)[37]: The study team assessed the report on the Zinc-Biofortified Wheat Program in Pakistan using the climate-nutrition integration framework detailed in this report. Based on the assessment, this document demonstrates Level 4 integration - reflecting a strong commitment to mobilize resources and implement distinct, actionable strategies that bridge climate resilience and nutrition outcomes.

This classification is supported by the document's comprehensive approach to addressing widespread zinc deficiency in Pakistan, where wheat accounts for "72 percent of Pakistans' daily caloric intake". The initiative leverages biofortification, a proven, cost-effective intervention, to improve nutritional outcomes and embed sustainability into Pakistan's food and agriculture systems. It highlights that "biofortification is being used to help address a malnutrition problem that costs Pakistan nearly US$3 billion in GDP annually," with over "60 million people in Pakistan" affected by inadequate zinc intake.

The program's implementation aligns closely with CSA principles. Within six years, it reached "1.4 million households, comprising 7 million people" through a well-structured scaling model covering research, seed development, commercialization, and consumer-level adoption. The report details a completetransformation of the staple food system, where "zinc wheat seed is now 20 percent of the wheat seed market" and is used in "packaged flour, bread, noodles, and breakfast cereals", signifying dietary integration.

From policy and institutional standpoint, document demonstrates high-level public sector commitment. The "inclusion of zinc wheat in the Punjab Seed Corporation Production Plan" and "mandatory zinc thresholds set by the government for new releases of wheat seed" confirm formal government anchoring. It further notes that "government support was critical in early scaling by purchasing seed for field trials", ensuring integration into public agricultural Research and Development (R&D) and procurement systems.

Technological innovation is a core driver of this success. The program adopted advanced methods such as "high-throughput micronutrient phenotyping, genomic selection, and speed breeding" to accelerate genetic gains. Collaborations like the "HarvestPlus-GAIN zinc rice commercialization project" and partnerships with domestic actors like "Family Farm Foods to produce 48 tons of zinc wheat flour in one year" illustrate a strong enabling ecosystem for long-term program sustainability.

The initiative also integrates robust M&E systems. It tracks the number of "households reached", and the volume of "seed released". Furthermore, the document emphasizes social inclusion through "diffusion, whereby farmers share seeds with other farmers informally", ensuring equitable access across communities.

This model offers strong alignment with nutrition-sensitive agriculture investment (Indicator 3.1), builds institutional capacity, engages policy, and tracks outcomes - all essential components of integrated climate-nutrition programming. It reflects a sustainable approach that avoids long-term subsidy dependence, as highlighted in the statement: "Markets must be designed to survive without (subsidies)", and positions biofortification as a viable exit strategy from donor-led programs.

[37]HarvestPlus & International Food Policy Research Institute (IFPRI). (2022). The journey of scaling in Pakistan: Zinc-enriched biofortified wheat. HarvestPlus.

To further **strengthen and sustain Level 4 Climate-Nutrition Integration:**

- Embed zinc-biofortification into national frameworks such as the NDC Implementation Plan, National Climate Change Policy, Agro-Ecological Zoning Strategies, and Food Security Action Plans. This will ensure sustained alignment between climate adaptation, agricultural productivity, and nutrition goals.
- Establish a standalone national policy that formalizes biofortification as a strategic approach to climate-smart nutrition. Align with SDG 2 targets (Zero Hunger) and the Global Nutrition Targets 2025 to ensure international coherence.
- Go beyond output-level indicators (e.g., households reached) to track impacts such as improvements in zinc biomarkers, reductions in stunting, and dietary diversity. Disaggregate findings by gender, region, and socioeconomic status to inform equitable programming.
- Mandate zinc thresholds for all newly released wheat varieties through the national seed certification system. This will institutionalize biofortification and incentivize innovation within public and private breeding programs.
- Leverage zinc wheat in school meal programs, food subsidy schemes, and maternal-child nutrition initiatives to ensure vulnerable groups benefit. Ensure public financing is allocated for procurement, distribution, and monitoring.
- Support R&D in precision agriculture, digital farmer platforms, and traceable supply chains to enhance adoption, transparency, and efficiency. These technologies can future-proof the scaling model and attract private investment.
- Extend the biofortification model to other micronutrient-dense staples such as rice, maize, and millet. Target new agro-ecological zones with high malnutrition burdens to ensure comprehensive national coverage.

> *"Diversification of your farming system... will actually answer most of the questions... in terms of climate change, food security and agriculture protection."*
>
> ***Discussion with Government Official***

National Pathways for Food Systems Transformation in Pakistan (2021)[38]: The document, National Pathways for Food Systems Transformation in Pakistan, surpasses simple policy alignment by offering a multi-dimensional, programmatic, and resourced approach to climate-nutrition integration. It includes a strategic action plan with defined implementation pathways, such as "promoting responsible agriculture for preserving soil fertility, enhancing water-use efficiency, and limiting emission of GHGs," and "separate allocation of funds and manpower for developing climate change resilient technologies." The plan also establishes stakeholder coordination mechanisms, engaging entities like the MoNFSR, provincial agricultural research institutes, and international organizations such as the Food and Agriculture Organization (FAO) and International Fund for Agricultural Development (IFAD). Financing instruments are clearly outlined, including "subsidized natural disaster insurance schemes," the "Natural Disaster Risk Management Fund," and the launch of an "Agriculture Impact Fund" to co-invest in downstream value chain activities like processing and cold storage.

The document features robust monitoring structures, such as the proposed "Food Security Information and Early Warning System (FSIEWS)," and acknowledges vulnerabilities among specific population groups, citing evidence like "40% of children aged below five years are stunted" and "62.7% of the population suffers from vitamin-D

[38]Government of Pakistan. (2021). National Pathways for Food Systems Transformation. Ministry of National Food Security and Research.

deficiency." It offers localized, evidence-based solutions, such as "enhancing availability of fresh fruits and vegetables to the dwellers of deep rural areas" and "reducing post-harvest losses and wastages of crop-livestock commodities." These measures are tied to existing policy instruments like the Pakistan Multisectoral Nutrition Strategy 2018-25 and international commitments such as the SDGs and the United Nations Food Systems Summit (UNFSS), particularly SDG2, which aims to "end hunger, achieve universal food security, and improve nutrition through sustainable agriculture."

By combining concrete commitments, institutional arrangements, and investment considerations, such as "adopting climate-resilient techniques for sustained food security" and "shifting towards a more sustainable food system along the value chain", the document meets the highest level of integration under the I-CAN framework. Its comprehensive, actionable, and evidence-driven approach ensures that climate and nutrition linkages are addressed holistically, making it a model for integrated policy design.

The following measures can be taken to enhance the climate-nutrition integration:

- The following measures can be taken to enhance the climate-nutrition integration:
- Operationalize the FSIEWS across provinces with full integration of nutrition indicators (e.g., stunting, wasting, dietary diversity) and climate projections (e.g., drought forecasts, flood risks).
- Establish a dedicated multi-sectoral climate-nutrition investment plan, linking agriculture, health, and disaster management budgets with KPIs.
- Promote local production of climate-resilient nutrient-dense crops, particularly in water-stressed and floodprone districts, as part of area-based resilience programming.
- Strengthen monitoring and accountability mechanisms under the National Food Systems Monitoring Committee (NFS-MC) by incorporating climate-nutrition scorecards aligned with I-CAN indicators.

Pakistan Dietary Guideline for Better Nutrition (2019)[39]: TAs per I-CAN Global Baseline Assessment report, “FBDGs are intended to provide the public with essential information on food groups, dietary patterns, nutrition and health, and to inform other national policies and procurement decisions. Each country produces a version of their FBDG in accordance with local eating habits, lifestyles, environmental conditions and customs. They are useful in informing both the public and policymakers on what a healthy diet should look like.”

The Pakistan Dietary Guidelines for Better Nutrition (PDGN) 2019 is a sector-specific nutrition document that focuses extensively on improving dietary behaviors, as evidenced by its comprehensive recommendations to "select and consume a variety of safe and nutritious foods that are easily available and affordable" and to reduce consumption of "energy dense foods such as deep fried foods, bakery products, processed foods." The guidelines highlight critical nutritional challenges, stating "about half of the population is deficient in one or more essential nutrients" and "women in Pakistan are more vulnerable to nutritional deficiencies... with 50% anaemic, 42% vitamin A and zinc deficient."

While the document addresses food safety concerns like "contaminated/untreated industrial wastewater" and "insecticides, pesticides, antibiotics and... heavy metals like lead, arsenic, mercury and cadmium in foods," these issues are not linked to climate-related environmental degradation or extreme weather impacts on food systems. Similarly, though the PDGN notes "poor infant and young child feeding (IYCF) practices are the leading cause of child morbidity and mortality," it does not explore how climate shocks (e.g., droughts, floods) may exacerbate these practices by disrupting food access or quality.

[39]Government of Pakistan. (2019). Pakistan Dietary Guidelines for Better Nutrition. Ministry of Planning, Development & Reform and Food and Agriculture Organization (FAO).

The guidelines also lack climate-resilient dietary recommendations. For instance, while promoting diverse diets ("wholegrain cereals, vegetables and fruits"), they omit strategies for maintaining nutrition security amid climate variability, such as drought-resistant crops or sustainable food storage. Institutional coordination for climate-nutrition action is absent, despite mentioning "public-private partnerships" for nutrition awareness.

Thus, the PDGN remains at Level 1 under the I-CAN framework. Its valuable but siloed nutrition focus, "simple to adopt, culturally acceptable options" and does not address the climate crisis as a determinant of malnutrition, nor does it propose adaptation measures, leaving a critical gap in Pakistan's food system resilience planning.

The following measures can be taken to enhance the climate-nutrition integration:

- Revise the PDGN to include a “climate-sensitive nutrition” lens, integrating concepts such as planetary health diets, low-emission food systems, and climate-resilient dietary patterns.
- Add a dedicated section or annex that outlines the intersection between food systems, dietary practices, and climate change, particularly how climate-related shocks impact food security and nutrition in Pakistan.
- Recommend the promotion of climate-resilient crops (e.g., millet, sorghum, lentils) that are nutrient-rich and can thrive under extreme weather conditions.
- Integrate climate risk awareness into nutrition education materials and BCC, especially for community-level health workers and school curricula.
- Propose cross-sectoral coordination mechanisms to align PDGN with climate change policies, NAPs, and food security strategies under the Ministry of Climate Change and the Ministry of Food Security.
- Encourage the development of a climate-nutrition action framework, detailing shared indicators and responsibilities across ministries, especially for vulnerable groups like women, children, and rural communities.

> *“GAIN has already worked with the Higher Education Commission (HEC) to introduce new food systems courses that include climate as a topic, and universities are now adopting these courses with their own variations.”*
>
> ***Discussion with GAIN***

3.3 CLIMATE-NUTRITION INITIATIVES AND INTERVENTIONS

The study team assessed the Green Climate Fund (GCF) and World Bank (WB) portfolios using the I-CAN four-level integration scale and assigned them ratings. This analysis is illustrative rather than an exhaustive portfolio review. The study team selected three GCF-supported initiatives (Recharge Pakistan, the Acumen Climate Action Pakistan Fund, and the Indus Basin Agriculture project) and three World Bank (Sindh LIVAQUA, CRISP, and the new Country Partnership Framework). Each was reviewed and assigned an I-CAN integration level based on document analysis.

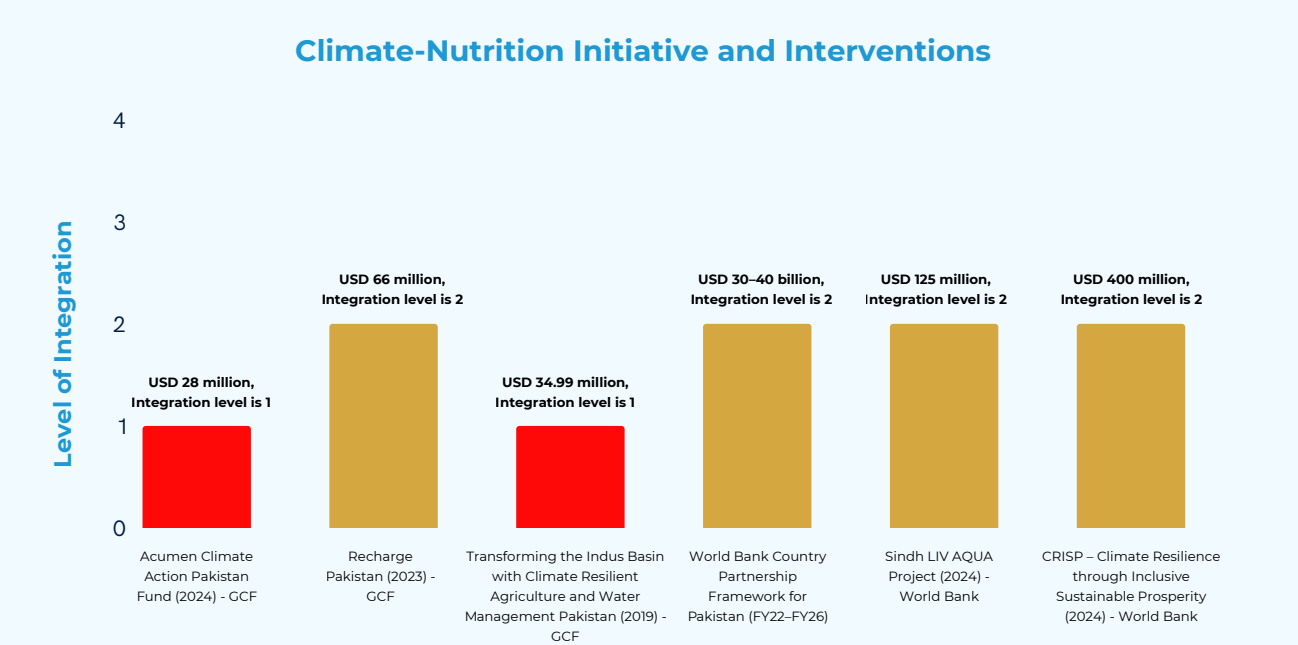


Figure 5. *Climate -Nutrition Initiatives and Interventions (Level of Integration)*

Acumen Climate Action Pakistan Fund (2024)[40]: The study team reviewed the Acumen Climate Action Pakistan Fund (ACAP) proposal, submitted to the GCF, against the climate-nutrition integration framework presented earlier in this report. Based on the assessment criteria, the integration level of this document is classified as Level 1 - No intentional connectedness between climate and nutrition.

This conclusion is drawn despite the proposal's well-defined climate adaptation agenda focused on Pakistan's vulnerable agriculture sector. The ACAP Fund concept is clearly on climate-centric investments in Pakistan's key sectors (agriculture with linkages to water and energy) and prioritizes environmental and economic outcomes over nutrition. The proposal describes ACAP as "Pakistan's first climate focused fund targeting climate adaptation in the critical agriculture sector," with investments in agribusinesses to build "farmer and system level climate resilience". It highlights co-benefits like improved "food and water security" and "increased access to energy" through sustainable farming practices, highlighting a focus on green innovation. Mitigating emissions and mobilizing finance are explicit goals: ACAP will back cleantech business models that "contribute to mitigation as well as climate resilience" and "developing and deploying climate finance solutions for agribusinesses... while catalyzing significant follow-on private capital". However, the proposal makes no mention of nutrition, dietary diversity, or food-system transformation - even as it aims for "more food secure households", it sets no explicit nutrition or dietrelated objectives or indicators. Instead, ACAP remains aligned with economic resilience and entrepreneurship: it seeks to "increase incomes for vulnerable farmers and make them more resilient to climate change" and expects the fund's model to "incentivise other entrepreneurs to develop more robust agriculture focused companies". Likewise, the solution pathway revolves around climate technology and business growth - for example, deploying "climate resilient production practices utilizing renewable energy, precision agriculture, and modern farm management" - with nutrition considerations absent in the project framing, stakeholder engagement, and M&E framework. Stakeholder convening's target "public and private sector leaders, agricultural leaders, academics, CSOs, and entrepreneurs" (not nutrition or health actors), and the monitoring metrics focus on climate adaptation and business performance, without integrating any nutrition or dietary diversity outcomes.

[40]Acumen. (2023). Acumen Climate Action Pakistan Fund (ACAP). Green Climate Fund (GCF) Proposal.

The following measures can be taken to enhance the climate-nutrition integration in future:

- Operationalize the Integrate nutrition-sensitive objectives by supporting the production and distribution of nutrient-rich and climate-resilient crops (e.g., millets, legumes, biofortified staples). Facilitate the participation of MSMEs that are engaged in maternal and child nutrition, fortified foods, and other public health-linked agrisolutions.
- Involve health and nutrition institutions including MoNHSR&C, UNICEF, GAIN, and national nutrition programs in advisory roles, governance structures, and implementation partnerships. This will help ensure nutrition expertise is embedded throughout fund planning and execution.
- Incorporate nutrition-focused KPIs such as dietary diversity scores, minimum acceptable diet (MAD) prevalence, and food consumption frequencies. Disaggregate these indicators by gender, age, and geography to capture equitable impacts and enable cross-sectoral accountability.
- Position nutrition resilience as a co-benefit alongside climate resilience. Clarify how ACAP's interventions contribute to national priorities on nutrition, link to SDG 2, and strengthen adaptive capacities of communities not just in economic terms, but in health and wellbeing outcomes.

Transforming the Indus Basin with Climate Resilient Agriculture and Water Management Pakistan (2019)[41]: The study team reviewed the project document "Transforming the Indus Basin with Climate Resilient Agriculture and Water Management", GCF-funded initiative implemented by FAO, to assess the extent of climate-nutrition integration using the I-CAN four-level framework. Based on this review, the project was assessed as meeting Level 1 of integration-no intentional connectedness between climate and nutrition.

The document concentrates on bolstering climate-resilient agriculture and water management for smallholders, stressing improved productivity, ecosystem resilience, and efficient water use rather than direct nutrition outcomes. It is "expected to improve the natural resources and agricultural land… based on improved, climate-resilient agricultural practices and natural resources management, specifically water management across the basin", leading to co-benefits like "improvement of nutrition and food security" and enhanced livelihoods (indeed, "livelihoods are expected to improve, based on increased adaptive capacities"). However, nutrition is not explicitly integrated: the project sets targets for food security (aiming for "all 1.3 million direct beneficiaries… (to) be food secure by project completion") but includes no nutrition-specific indicators or direct interventions in diets or health. Instead, the emphasis is on economic and ecological resilience - for example, climate-smart measures are chosen because they "improve profitability, even under current conditions," given that "the top priority of smallholder farmers… is to solve their current economic problems". Even diversification strategies (e.g. "multiple cropping of fruits and vegetables" as a climate-resilient practice) are framed for adaptation benefits and farmer incomes rather than nutrition. Moreover, stakeholder engagement remains sector-focused: the governing project committee includes climate, agriculture, water and planning authorities, with no involvement of health or nutrition ministries, thus limiting cross-sectoral integration of nutrition considerations.

The following measures can be taken to enhance the climate-nutrition integration in future:

- Expand the project's scope to include diversification of nutrient-rich crops (e.g., pulses, millets, leafy greens), community gardening, and agro-ecological approaches that support local food system resilience. These interventions should not only aim at productivity gains but also target nutritional adequacy of household diets.

[41]Food and Agriculture Organization of the United Nations (FAO). (2019). Transforming the Indus Basin with Climate Resilient Agriculture and Water Management. Green Climate Fund (GCF) Funding Proposal FP108.

- Incorporate indicators such as Minimum Dietary Diversity (MDD), Household Food Consumption Score (FCS), and women's and children's anthropometric outcomes (e.g., stunting rates, MUAC) to measure impact on nutrition. These needs to be tracked disaggregated by age and gender.

- Include the MoNHSR&C, MoNFSR, UNICEF, FAO, WFP, and nutrition-focused NGOs as part of the project steering committee and field-level implementation teams. Their inclusion can enhance the design and delivery of nutrition-sensitive interventions.

- Future baseline and midline assessments should include nutrition-related risks (e.g., household food insecurity, micronutrient deficiencies) to inform targeted and evidence-based adaptation planning.

Recharge Pakistan (2023)[42]: The study team assessed the Recharge Pakistan: Building Pakistan's resilience to climate change through Ecosystem-based Adaptation (EbA) and Green Infrastructure for integrated flood risk management project, implemented by WWF-Pakistan with support from the GCF, against the climate-nutrition integration criteria used in this report. Based on this review, the document meets Level 2 of integration - indicating some intention to connect climate and nutrition.

This classification stems from the project's overarching focus on EbA, water resource management, and climate resilience; it only indirectly touches on nutrition. The focus is explicitly stated as "Building Pakistan's resilience to climate change through Ecosystem-based Adaptation (EbA) and Green Infrastructure for integrated flood risk management". Climate change impacts include risks to food security, such as "crop loss/failure and water stress", which "have implications for malnutrition, which is already severe in Pakistan, with nearly half of all children suffering from malnutrition". Nutrition is not an explicit outcome, objective, or monitored component; instead, the project's adaptation outcome targets "Health and well-being, and food and water security" as one of four GCF adaptation result areas, but no percentage allocation is provided for this category. Livelihood interventions reference agriculture, noting that "45% of the workforce in Pakistan" is employed in agriculture and that the sector faces "devastating crop losses" due to climate change. However, activities under Outcome 3 (Enhanced resilience of community livelihoods) focus on "climate-resilient agricultural inputs", "irrigation practices", and "soil management", with no mention of food diversity, nutrition-sensitive agriculture, or dietary outcomes. While Component 3 aims to improve "livelihood security", nutrition-specific ministries or actors (e.g., Health, Nutrition, or Agriculture extensions) are absent from the list of stakeholders in the National Working Group or implementation structure. Thus, though the project acknowledges linkages between climate impacts and malnutrition, the nutrition-climate nexus is not systematically integrated into design or monitoring.

The following measures can be taken to enhance the climate-nutrition integration in future:

- The project needs to explicitly link EbA interventions with local food system resilience by promoting the cultivation of nutrient-dense, climate-resilient crops (e.g., pulses, millets, and biofortified staples). Naturebased solutions should include community-managed gardens, diversified cropping systems, and agroecological approaches that enhance both ecological and dietary outcomes.

- Nutrition-related indicators-such as household dietary diversity, prevalence of food insecurity, or nutrition status of women and children-should be included in the project's results framework. These indicators would enable systematic tracking of the nutritional benefits of EbA and green infrastructure interventions.

[42]WWF-Pakistan. (2023). Recharge Pakistan: Building Pakistan's Resilience to Climate Change through Ecosystem-based Adaptation in the Indus Basin. Green Climate Fund (GCF) Funding Proposal.

- Include key actors such as the Ministry of Health, Ministry of Food Security, FAO, UNICEF, and WFP as technical or implementation partners. Their expertise will strengthen the project's ability to address food and nutrition security in tandem with environmental goals.

- Foster joint planning and coordination between climate/environment agencies and health/nutrition departments. Establishing inter-ministerial working groups or steering committees that include both climate and nutrition representation would ensure that ecosystem-based interventions yield co-benefits for human health and dietary resilience.

- Future iterations of the project or scale-up proposals should present nutrition as a key co-benefit of climate

- adaptation. Integrating nutrition considerations into proposals to the GCF, GEF, or other climate funds will not only strengthen alignment with SDG 2 (Zero Hunger) but also broaden the project's impact across development sectors.

The table below provides a summary of the reviewed GCF projects/initiatives, highlighting their total financing, corresponding share of the portfolio, and their assessed I-CAN integration levels. It is important to note that this reflects only the specific projects/initiatives reviewed and does not represent a comprehensive analysis of the entire GCF portfolio in Pakistan. The data shows that 49% of the investment falls under Level 1, 51% under Level 2, and no investment is recorded at Level 3 or Level 4.

Table 5: GCF Projects in Pakistan - Funding Distribution by I-CAN Integration Level

I-CAN Level	Total Financing (USD)	Share of GCF Portfolio (%)	GCF Project
Level 1	$62.99M	49%	Acumen Climate Action Pakistan Fund (2024); and Transforming the Indus Basin with Climate Resilient Agriculture and Water Management Pakistan (2019)
Level 2	$66M	51%	Recharge Pakistan (2023)
Level 3	-	0%	-
Level 4	-	0%	-

World Bank Country Partnership Framework for Pakistan (FY26-FY35)[43]: The study team assessed the World Bank Group's Country Partnership Framework (CPF) for the Islamic Republic of Pakistan for FY26FY35 using the climate-nutrition integration criteria of this report. Based on the review, the document meets Level 2 of integration - indicating some intention to connect climate and nutrition.

This classification is based on the CPF's high-level acknowledgment of Pakistan's overlapping climate, health, and food system challenges, but the absence of structured, operational mechanisms linking climate and nutrition outcomes. The CPF outlines six strategic outcomes, including reducing child stunting and increasing climate resilience. It recognizes that Pakistan is facing "severe human development challenges," with stunting among children under five remaining "among the highest in the world" and the country being identified as a "hunger hotspot of high concern." It also flags Pakistan's "exceptional exposure to climate change," highlighting food insecurity as a key emerging issue.

Nutrition is embedded within the human capital agenda, particularly through the objective of "reduced child stunting-both a health, nutrition, and family planning agenda." In parallel, the CPF outlines climaterelated priorities such as "resilience of agriculture, ecosystems, and communities to climate shocks," "climate-smart agriculture," and "disaster-resilient infrastructure." However, these components are treated in sectoral silos. Nutrition is not integrated into climate mitigation/adaptation components, and no indicators, budgets, or co-financing strategies are provided to link climate investments with improved nutrition outcomes.

> *"It was proposed that some percentage of climate adaptation budgets be earmarked for nutrition-sensitive actions, and vice versa"*
>
> ***National Stakeholder Workshop***

Although the CPF refers to transforming Pakistan's food systems and acknowledges the need for multisectoral approaches" to reduce stunting, it does not operationalize this with joint investments, institutional coordination, or monitoring frameworks. Notably, CSA is discussed, but without explicit links to dietary diversity, nutrition-sensitive value chains, or the inclusion of health and food security ministries as co-leads in climate planning. As a result, the CPF remains conceptually aligned but falls short of achieving integrated, resourced action across sectors.

The following measures can be taken to enhance the climate-nutrition integration in future revisions or during CPF implementation:

- Embed nutrition as a climate resilience objective across agriculture, water, health, and energy sectors by integrating nutrition-sensitive design into infrastructure, WASH, and food system interventions.
- Introduce nutrition-specific indicators (e.g., household dietary diversity, child growth metrics, food access scores) into the CPF Results Framework and link them with climate-related goals such as rural resilience or agricultural transformation.
- Ensure climate financing includes nutrition co-benefits by investing in interventions such as climate-resilient crop diversification, kitchen gardens, women-led agriculture cooperatives, and nutrition-sensitive adaptive safety nets.
- Establish a cross-sectoral investment platform under the CPF that brings together the Ministries of Climate Change, Health, and Food Security to jointly design and implement resilience-building programs targeting food and nutrition security.
- Institutionalize joint planning, tracking, and MRV mechanisms that measure the double dividend of climate adaptation and nutrition improvement, aligned with SDG 2 (Zero Hunger), SDG 3 (Good Health), and SDG 13 (Climate Action).

[43]World Bank. Pakistan - Country Partnership Framework for the Period FY26 Up to FY35 (English). Washington, D.C. : World Bank Group.

Sindh LIVAQUA Project (2024)[44]: The study team assessed the LIVAQUA project, World Bank-supported initiative aimed at building inclusive, green, and climate-resilient livestock and aquaculture sectors in Sindh. Based on climate-nutrition integration criteria, the project is rated at Level 2 - Some intention to connect climate and nutrition.

The LIVAQUA project emphasizes improved access to climate-resilient water supply, sanitation, and drainage systems in vulnerable urban areas of Sindh, "All project activities will contribute to CPS Result Area 3 on addressing inclusion and reducing inequalities for vulnerable groups. The project will also contribute to addressing the cross-cutting issue of climate resilience by supporting preparedness towards climate-related risks." It integrates WASH, urban resilience, gender, and social inclusion, which are indirectly linked to nutritional outcomes, "Greater and quality fish consumption, which provides nutrients and healthy fats, can further contribute to improved nutrition, especially among the poor." However, the project does not explicitly mention malnutrition reduction, dietary improvements, or climate-sensitive

food systems, "To support the competitive, inclusive, green, and resilient development of the livestock and aquaculture sectors in Sindh". Health and nutrition ministries or organizations are not reflected in implementation or M&E design, "Implementing Agencies … Livestock and Fisheries Department, Sindh Province". While its focus on water security and flood resilience contributes to a healthier living environment ("Floods are a principal hazard in Sindh as demonstrated by the devastating floods in 2010, 2011, 2012 and 2013 and most recently in September 2022."), the nutrition-climate interface is not strategically embedded in its core theory of change or investment logic, "a. Competitive and inclusive: Increased productivity, value addition, and marketed volumes of small and medium livestock and aquaculture producers" and "b. Green: Contribution to reductions in GHG emissions intensity."

The following measures can be taken to enhance the climate-nutrition integration in future revisions:

- Integrate nutrition-sensitive WASH goals into project objectives, especially in malnutrition hotspots.
- Add nutrition indicators (e.g., dietary diversity, diarrheal disease prevalence) to the M&E framework.
- Involve health and nutrition stakeholders (e.g., Department of Health, UNICEF) in planning and oversight.
- Design interlinked WASH-nutrition interventions, particularly targeting maternal and child health in vulnerable areas.

CRISP - Climate Resilience through Inclusive Sustainable Prosperity (2024)[45]: The study team reviewed the World Bank's CRISP Additional Financing provides US$400 million to strengthen Pakistan's shockresponsive safety nets through BISP. It aims to improve delivery systems and protect early childhood and schooling-age human capital, particularly during climate-related and economic crises. The program includes biometric payments, inflation-indexed cash transfers, and continuation of Nashonuma (nutrition CCT) and Taleemi Wazaif (education stipends). It promotes federal-provincial coordination and seeks to decentralize social protection over time. Based on climate-nutrition integration criteria, the project is rated at Level 2 - Some intention to connect climate and nutrition.

CRISP highlights inclusive climate resilience through infrastructure, ecosystem restoration, and improved service delivery, especially in flood-prone rural areas, "to enhance climate resilience of the rural economy and living conditions of communities in project areas through investments in resilient infrastructure and services, nature-based solutions, and improved

[44]Chaudron,Myriam Mireille Veronique. Concept Project Information Document (PID) - Sindh Livestock and Aquaculture Sectors Transformation Project - P179003 (English). Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/099042723021515595

[45]World Bank. (2024). Crisis-Resilient Social Protection Program – Additional Financing: Program Paper (Report No: PAD5619). International Development Association.

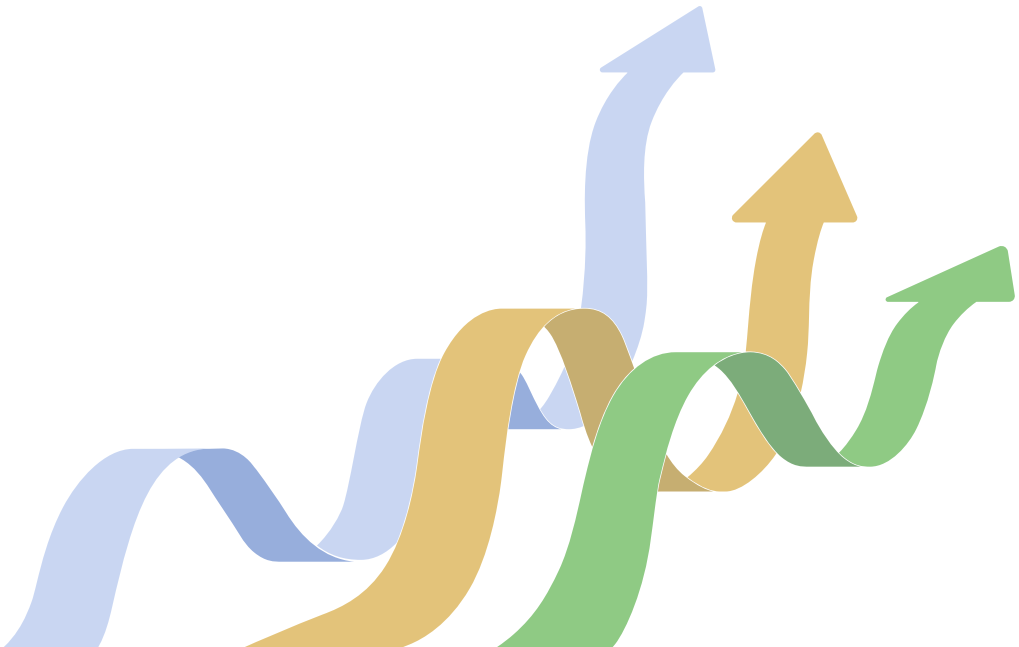
disaster risk management practices". It identifies livelihoods, food security, and poverty reduction as central development concerns, "with a strong focus on improving livelihoods, reducing poverty, and enhancing food security of vulnerable rural populations in the face of climate change impacts". However, nutrition is not directly addressed in the results framework, sectoral analysis, or stakeholder engagement, and "the results framework includes indicators on resilience, service delivery, and infrastructure, but lacks indicators related to health or nutrition outcomes". While investments in resilient agriculture and rural infrastructure can yield indirect nutritional benefits, "support to climate-smart agriculture is aimed at enhancing rural productivity and resilience, though nutrition is not explicitly mentioned as a target outcome", the project does not propose nutritionsensitive agriculture, food system interventions, or dietary indicators. Health and nutrition sectors are notably absent from coordination and planning frameworks, as the project's implementation arrangements emphasize coordination between irrigation, agriculture, and disaster risk management departments, with no identified collaboration with health or nutrition authorities, reducing the integration depth under the I-CAN approach.

The following measures can be taken to enhance the climate-nutrition integration in future revisions:

- Introduce explicit nutrition co-benefits within climate-resilient agriculture and infrastructure components.
- Incorporate targeted nutrition-sensitive indicators (e.g., dietary diversity, household food security, nutrient-rich food availability).
- Mainstream collaboration with nutrition-focused institutions (e.g., Ministry of Health, Ministry of Food Security, WFP and others).
- Prioritize investments for women-led agriculture and nutrition initiatives, linking resilience with maternal and child health outcomes.

"The general donor mindset is evolving, and there is growing recognition that nutrition and climate cannot be addressed in isolation. This shift provides opportunities for GAIN and other stakeholders to advance integrated strategies across Pakistan."

Discussion with GAIN



The table below provides a summary of the reviewed World Bank projects/initiatives, highlighting their total financing, corresponding share of the portfolio, and their assessed I-CAN integration levels. It is important to note that this reflects only the specific projects/initiatives reviewed and does not represent a comprehensive analysis of the entire World Bank portfolio in Pakistan. The data shows that 100% of the investment falls under Level 2 and no investment is recorded at Level 3 or Level 4.

Table 6: World Bank Projects/Initiatives in Pakistan - Funding Distribution by I-CAN Integration Level

I-CAN Level	Total Financing (USD)	Share of GCF Portfolio (%)	GCF Project
Level 1	-	0%	-
Level 2	$40,525M	100%	World Bank Country Partnership Framework for Pakistan (FY22-FY26); Sindh LIVAQUA Project (2024); CRISP - Climate Resilience through Inclusive Sustainable Prosperity (2024)
Level 3	-	0%	-
Level 4	-	0%	-

3.4 CLIMATE-NUTRITION DATA AND KNOWLEDGE PORTALS

As per I-CAN Global Baseline Assessment report, "data and knowledge portals are typically managed by international organisations, research institutes, and Non-Governmental Organizations (NGOs). They provide not only the academic community but also the public with updated information on climate change and nutrition across regions and time periods, shining light on some important trends that inform policymaking."

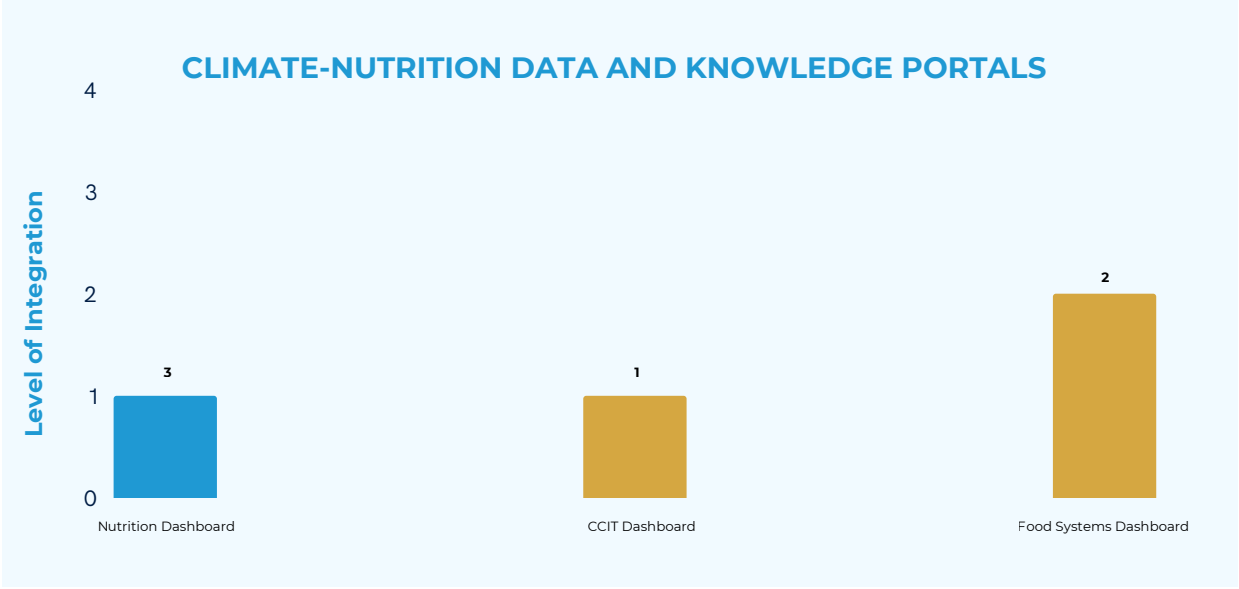


Figure 6. Climate -Nutrition Data and Knowledge Portals (Level of Integration

The integration of climate and nutrition in Pakistan's data and knowledge systems remains in its early stages, reflecting global patterns highlighted in the I-CAN Baseline Assessment Report. At the global level, 38% of portals reviewed were categorized at Level 1, indicating no deliberate effort to interlink climate and nutrition data, while only 8% reached Level 4, reflecting robust integration with cross-sectoral evidence and analytics.

In Pakistan, while digital platforms are operational and have sectoral strengths, they fall short of achieving full convergence of climate and nutrition data at a level sufficient for integrated planning and policy action. Notably, three key portals were identified during landscaping exercise with varying progress toward integration: the Nutrition Dashboard[46] managed by the MoNHSRC, the Pakistan Climate Change

Implementation Tool[47] (CCIT) dashboard, and the globally hosted Food Systems Dashboard[48] for Pakistan.

The Nutrition Dashboard offers robust tracking on indicators such as stunting, wasting, underweight prevalence, micronutrient deficiencies, and coverage of nutrition-specific interventions. However, it lacks any linkage to climate data such as temperature stress, drought incidence, or seasonal food availability placing it at Level 1 of integration.

The CCIT Dashboard serves as a central platform under the Climate Change Implementation Framework, showcasing data on greenhouse gas emissions, climate adaptation projects, and forecasting for droughts and floods. Despite its depth on climate parameters, the dashboard currently does not incorporate any nutrition-relevant metrics or indicators, such as dietary intake patterns, food insecurity under climatic stress, or nutritional vulnerabilities also classifying it as Level 1.

The Food Systems Dashboard, developed in collaboration with international partners including GAIN, provides a more multidimensional perspective. It brings together data on food environments and nutrition outcomes such as agricultural productivity, sustainability, and dietary patterns. While it reflects a growing recognition of cross-sectoral dynamics with climate such as agricultural emissions and crop diversity, it still lacks analytics that connect climate shocks with nutrition outcomes. Therefore, it is placed at Level 2, reflecting emerging but limited cross-sectoral awareness.

This limited integrated climate-nutrition data systems reflects a missed opportunity for evidence-based action. Policymakers currently lack the tools to overlay nutrition hotspots with climate vulnerability zones, impeding effective risk-informed planning and resilient food systems design. The findings point to a critical need to either enhance existing platforms with integrated analytics or establish a unified national portal that synthesizes climate and nutrition data disaggregated by geography, gender, and socioeconomic vulnerability for timely and targeted interventions.

> *"There was equally strong agreement that data and information systems do not link climate variables with nutrition outcomes, an area seen as a critical gap to fill."*
>
> ***National Stakeholder Workshop***

> *"There is no integration in the food system dashboard....did not see (the climate) sector... climatic indicators should become an essential part of the food system and its statistical analysis."*
>
> ***Discussion with Academia***

> *"There is no relevant, pertinent, or latest data anywhere. We are still relying on nutrition surveys from 2011, 2018, ... Without updated data, these things cannot move forward."*
>
> ***Discussion with Development Organizations***

[46]Ministry of National Health Services, Regulations & Coordination. (n.d.). Nutrition Dashboard. Retrieved May 9, 2025, from https://shorturl.at/7BjFI
[47] Ministry of Climate Change. (n.d.). Pakistan Climate Portal. Retrieved May 9, 2025, from https://ccit.pk/
[48] Global Alliance for Improved Nutrition (GAIN), Food and Agriculture Organization (FAO), Columbia Climate School, & Johns Hopkins University. (2024). Pakistan Food Systems Dashboard. Retrieved May 8, 2025, from https://www.foodsystemsdashboard.org/countries/pak/fsci

There is a need to upgrade existing portals or create new ones that enable integrated analytics e.g., mapping stunting prevalence against climate vulnerability zones, or examining the nutrition impacts of climate-induced disasters. Doing so would directly support evidence-based decision-making for anticipatory action and resilient food systems.

To achieve a Level 4 classification, Pakistan must develop or adapt data portals that:

- Include joint climate-nutrition indicators;
- Allow disaggregated data visualization (e.g., by gender, region, or age);
- Offer downloadable datasets for researchers and policymakers;
- Present actionable policy recommendations based on integrated data i.e., the data portal should not just show climate and nutrition data side-by-side, but it should also analyze the relationship between them and provide clear, practical guidance for decision-makers on what actions to take.

> *"One recommendation was to link early warning systems for climate hazards to nutrition monitoring. For instance, if the meteorological and agricultural departments predict a drought, this information should immediately be shared with those managing nutrition... The nutrition sector could then activate contingency plans in those areas."*
> ***Discussion with Academia***

These portals should be co-developed with inputs from government departments, academia, think tanks, UN agencies, and civil society, ensuring ownership and usability.

3.5 COMPARATIVE CLIMATE-NUTRITION VULNERABILITY ASSESSMENT - PAKISTAN[49]

This analysis compares the climate and nutrition vulnerability of seven administrative units of Pakistan including KP, Punjab, Sindh, Balochistan, Gilgit-Baltistan, AJ&K, and Islamabad Capital Territory (ICT).

The comparative vulnerability matrix is derived using a structured framework based on the IPCC definition of vulnerability, which conceptualizes vulnerability as a function of three core components: exposure, sensitivity, and adaptive capacity. This model was adapted and expanded to incorporate nutrition dimension. As nutrition is central point of this I-CAN baseline assessment.

To assess climate exposure, the matrix evaluates the frequency, intensity, and type of climate-related hazards such as floods, droughts, heatwaves, sea-level rise, and GLOFs. Data for climate exposure assessment is collected from Climate Change Risk Assessment for Pakistan and also from provincial climate change action plans. Moreover, Sensitivity reflects the ecological and socioeconomic fragility of each unit, taking into account factors like terrain, agriculture dependency, rural-urban disparities, and food system vulnerabilities. This dimension draws on analysis of land use, livelihood systems, and infrastructure quality outlined such as in climate-health V&A. Adaptive capacity considers the strength of institutions, availability of services (particularly WASH, health, and disaster response), and governance mechanisms to manage shocks and ensure resilience. The data is collected from the review of Climate and Health Vulnerability Assessment: Pakistan, provincial climate change policy documents of Sindh and AJK. Nutrition burden, incorporated as a cross-cutting factor, includes indicators such as stunting, wasting, adolescent anaemia, overweight, and food insecurity. The data is collected primarily from the

[49]This is not a standalone document but rather a heading. The mentioned documents and data portal on climate and nutrition in this baseline assessment were taken into account to conduct vulnerability assessment for different geographical units of Pakistan.

National Nutrition Survey 2018, Pakistan Adolescent Nutrition Strategy, Pakistan Multi-Sectoral Nutrition Strategy, Pakistan Dietary Guidelines for Better Nutrition and Food System Dashboard.

Each region is qualitatively assessed as having high, medium, or low levels of vulnerability in each category. The overall vulnerability score is determined by triangulating these four dimensions. This approach allows for evidence-based prioritization of provinces for I-CAN interventions and supports strategic decision-making aligned with global climate-nutrition integration practices.

Table 7: Comparative Vulnerability Assessment Matrix of Pakistan

Region	Climate Exposure	Sensitivity	Adaptive Capacity	Nutrition Burden	Overall Vulnerability Rating	Key Justification
KP	High (floods, heatwaves, landslides)	Medium (mountainous terrain, agriculturede pendent)	Medium (DRR structures exist but uneven WASH/health coverage)	High (Wasting: 23.1%, Adolescent anaemia: 46.8%). Food insecurity significant; rural undernourishment elevated. Child stunting and wasting align with national averages (≈38% stunting; >20% wasting in vulnerable zones).	High	Compound risks, especially in and northern urban southern dist low resilience
Punjab	High (heatwaves, monsoon irregularity, floods, drought)	Medium (agricultural productivity decline, periurban vulnerability)	Medium (stronger infrastructure and health delivery)	High (Stunting: 36.6%, Anaemia: 55.4%). Despite being a major food-producing region, urban malnutrition is rising. Dashboard shows heavy cereal dependence and moderate fruit/vegetable availability.	High	Critical food-producing zone; rising urban malnutrition and overweight prevalence.
Sindh	Very High (heatwaves, floods, sealevel rise, drought, cyclone)	High (coastal fragility, urban slums, desert poverty)	High (weak DRR-health linkages, poor rural services)	Very High (Wasting: 23.3%, Anaemia: 61.2%, Food Insecurity: 76%). Extreme food insecurity (Tharparkar >75% food insecure); diet diversity very low	Very High	Tharparkar face extreme climate with chronic nutrition crisis; 2022 floods deeply affected dietary access
Balochistan	Very High (droughts, land degradation, extreme remoteness)	Very High (sparse services, ecosystem collapse in parts)	Very High (lowest access to health, education, DRR)	Very High (Stunting: 46.6%, Anaemia: 63.3%) Heavy reliance on staples, low fruit/veg/pulse supply, severe food access constraints	Very High	Highest structural fragility, but logistical barriers may constrain immediate impact

Gilgit-Baltistan	Medium (glacial melt, GLOFs, landslides)	High (ecological fragility, transport bottlenecks)	Medium (some targeted programming emerging)	Medium (Wasting: 9.4%, Adolescent stunting: 25.2%) Better dietary diversity (traditional preservation practices)	Medium	Episodic climate shocks and challenging geography limit year-round access, but nutrition indicators are relatively better.
AJ&K	Medium (floods, landslides, glacier retreat)	Medium (mountain terrain, forest loss)	Medium (some existing integration structures)	High(67%-highest Pakistan) significant insecurity households insecure, stunting approximately 39%) Anaemia: in and food (≈57% food child	High	High anaemia and adolescent vulnerabilities; requires school focused interventions
Islamabad Capital Territory	High (urban floods, heatwave, air pollution)	Medium (peri-urban slums, migrant populations)	Low (strong infrastructure but gaps in urban resilience)	High (Anaemia: 44.2%, Overweight: 14.4%, High adolescent malnutrition) ; dietary diversity constrained in periurban populations	High	Rising urban climate risks + emerging noncommunicable diseases such as overweight, obesity, and related chronic conditions + expanding periurban nutrition challenges

Rationale for Sindh Selection Sindh:

- High exposure to drought, heatwaves, urban floods, and coastal degradation.
- Worst nutrition indicators in the country including highest wasting and anaemia rates.
- Urban informal settlements and Tharparkar desert face compounded risks.
- 2022 flood crisis resulted in over 8 million food-insecure individuals.

Based on this analysis, Sindh is suggested as priority site for intervention due to their strategic relevance, severity of combined vulnerabilities, and feasibility of multi-sectoral impact.

> *"For instance, a provincial climate adaptation plan in Sindh must prioritize flood protection, salinity control, and drought mitigation... coupled with nutrition safety nets for displaced populations. Balochistan's strategy... might focus on water harvesting and drought-resistant crops... along with targeted nutrition programs."*
> ***National Stakeholder Workshop***

4. CONCLUSION

The findings of this baseline assessment present a pivotal moment for Pakistan's climate and nutrition agendas, a moment defined as much by its recognized gaps as by the clear opportunities for transformation. The analysis reveals that while the policy landscape in Pakistan increasingly acknowledges the intersections of climate change and nutrition, this recognition remains, in large measure, rhetorical rather than systemic. Moving from awareness to integration requires a fundamental shift in how policies, institutions, and investments are conceived, coordinated, and implemented at all levels.

Across national and provincial frameworks, climate and nutrition have historically traveled parallel tracks, intersecting sporadically but rarely converging through shared targets or resource commitments. Key policy documents, such as the Updated NDC, National Climate Change Policy, and provincial adaptation plans, offer clear references to the nutritional impacts of climate change still stop short of embedding nutrition as a measurable, resourced objective within climate strategies. The NAP stands as a notable exception, moving the discourse toward more explicit linkages and actionable commitments. Even so, the operationalization of these commitments remains hindered by a lack of dedicated indicators, budget lines, and robust monitoring systems.

At the provincial level, progressive language in policies from Balochistan, Sindh, and KP signals growing intent to address climate-nutrition nexus, but implementation is still hampered by absence of crosssectoral coordination mechanisms and concrete nutrition-sensitive adaptation plans. Provincial documents often frame nutrition as an implicit co-benefit rather than as a deliberate, tracked outcome of climate action. This pattern continues fragmentation, with local innovation and pilot projects failing to scale or inform broader systemic change.

The assessment exposes deep-rooted barriers that inhibit the journey toward integrated climate-nutrition programming. Among these is the persistence of institutional silos-where climate and nutrition are governed, financed, and measured by distinct ministries and sectoral bodies, with limited mandates or incentives for joint planning. Even where high-level frameworks acknowledge the value of multi-sectoral collaboration, practical mechanisms for convening diverse actors, pooling resources, and sharing data remain weak or altogether absent.

This fragmentation is mirrored in financial flows. Major investment vehicles such as the Green Climate Fund and World Bank-supported initiatives tend to focus on agriculture, disaster resilience, or rural livelihoods, with nutrition outcomes relegated to peripheral consideration or omitted entirely. The lack of nutrition-sensitive criteria in the design, appraisal, and monitoring of climate projects means that significant climate finance is deployed without leveraging potential co-benefits for dietary diversity, food safety, and the reduction of malnutrition. The opportunity cost of such "business as usual" approaches is substantial, especially given Pakistan's acute vulnerability to both climate hazards and nutritional deficits.

Another critical bottleneck lies in the evidence base and data systems underpinning policy and investment decisions. Existing information portals and dashboards remain siloed by sector, limiting the ability of decision-makers to visualize, analyze, or act upon the dynamic interplay between climate risks and nutrition outcomes. The absence of integrated indicators and joint vulnerability mapping constrains both targeting and evaluation of interventions. This not only impedes adaptive management but also obscures accountability for results across the climate-nutrition continuum.

Furthermore, fragmented data systems hinder Pakistan's ability to anticipate emerging risks such as the compounding effects of drought, heatwaves, or floods on food security and malnutrition. The report finds that climate-health vulnerability assessments and risk profiles often highlight nutrition only in passing, without establishing clear monitoring and evaluation frameworks or pathways for integrating nutrition data into early warning and anticipatory action systems. As a result, policy learning is slow, and missed opportunities persist for preventive and timely action.

Capacity constraints represent both a challenge and an opportunity for transformative integration. Government stakeholders, implementing partners, and frontline actors demonstrate growing awareness of the climate-nutrition nexus, but often lack the training, tools, and institutional support to design or deliver integrated solutions. This is especially pronounced at the local government and community levels, where technical assistance and cross-sectoral dialogue are urgently needed.

Importantly, the assessment highlights the centrality of equity and community voice in advancing the climate-nutrition agenda. Vulnerable populations experience the greatest burden of climate and nutritional risks, often excluded from policy design and resource allocation processes. Without mechanisms for meaningful participation, context-sensitive programming, and accountability to affected populations, efforts to build resilience will fall short.

This baseline assessment is not an endpoint but a call to action, a foundation upon which to build a more coherent, evidence-based, and equitable approach to tackling the twin crises of climate change and malnutrition in Pakistan. By shifting from fragmented acknowledgment to purposeful integration, Pakistan can align national aspirations with global commitments such as the SDGs (it will maximize the adaptation and nutrition, advancing SDG 2 Zero Hunger and SDG 13 Climate Action). By investing in integrated systems, inclusive governance, and targeted innovation, Pakistan can not only mitigate the worst impacts of climate change and malnutrition but unlock new pathways for sustainable growth, human wellbeing, and social equity.

The following table summarizes the policies, strategies, and initiatives of Pakistan in this baseline assessment, along with their assessed levels of climate-nutrition integration.

Table 8: Adapted Indicators for Pakistan I-CAN Baseline Assessment, Levels of Climate–Nutrition Integration in Policies, Strategies, and Initiatives

Region	Climate Exposure	Sensitivity
Pillar 1: Implimentation, Action, and Support	1.1 Extent to which Pakistan's NDC document integrates nutrition-related actions	Pakistan Updated Nationally Determined Contributions 2021 (Level 2)
	1.2 Extent to which Pakistan's NAP document integrates nutrition-related actions	National Adaptation Plan, Pakistan 2023 (Level 4)
	1.3 Number of climate-informed nutrition interventions and programmes in Pakistan	Pakistan National Food Security Policy 2018 (Level 3)
	1.4 Extent to which Pakistan's national nutrition policy documents refer to climate	Pakistan Multi-Sectoral Nutrition Strategy 2018-2025 (Level 2)

Pillar 2: Capacity Building, Data, and Knowledge Transfer	2.2a Number of documents that have conducted a climate change and health vulnerability assessment (V&A) which included nutrition	Climate and Health Vulnerability Assessment 2024 (Level 2)
	2.2b Number of data and knowledge portals that bring climate and nutrition together in Pakistan	Nutrition Dashboard (Level 1), CCIT dashboard (Level 1), Food Systems Dashboard (Level 2)
Pillar 3: Policy and Strategy	3.1 Number of documents which are promoting climate-smart nutritious foods such as neglected underutilized species (NUS) and fortified / biofortified crops and staple foods	Pakistan Strategy to Promote Climate Smart Agriculture Transformation 2021 (Level 2)
	3.2 Number of food-based dietary guidelines documents that include climate considerations	Pakistan Dietary Guideline for Better Nutrition 2019 (Level 1)
Pillar 4: Investments	4.1 Value of Green Climate Fund initiatives in Pakistan that include nutrition considerations	Three GCF projects reviewed; USD 62.99M (Level 1) USD 66M (Level 2)
	4.2 Value of World Bank initiatives in Pakistan that are nutrition and climate supporting	Three World Bank documents reviewed; USD $40,525M (Level 2)

5. RECOMMENDATIONS

Based on the above findings presented, the recommendations are as follows:

- **Integrated Climate- Nutrition Policies, Strategies, and Action Plans:** Integrate explicit, measurable nutrition/climate objectives within Pakistan's NDCs, NAPs, CCRAs and related climate/nutrition strategies. This includes the adoption of SMART indicators that track the nutritional impacts of climate change and guide evidence-based interventions. For example, promote the cultivation and diversification of nutrient-dense, climate-resilient crops such as drought-tolerant millets, moringa trees, or zinc-fortified wheat. Encourage inclusion of climate-smart dietary goals in agriculture and food security policies.

Justification: The findings show that Pakistan's NDC and several provincial plans scored Level 2 or 3 because they mention food security and agriculture but lack concrete nutrition targets, indicators, or budgets. Aligning strategies with explicit climate nutrition objectives will address these gaps.

- **Strengthened Cross-Sectoral Coordination Mechanisms:** Strengthen institutional linkages between climate, nutrition, health, agriculture, and food sectors by creating formal coordination platforms such as Climate-Nutrition Task force to facilitate joint planning and implementation of nutrition-sensitive climate actions at national and subnational levels. Local disaster management committees could also integrate nutrition preparedness (e.g. pre-stocking RUTF or mobilizing nutrition teams ahead of floods), ensuring rapid joint action during climate shocks.

Justification: The findings show the lack of institutional coordination between climate and nutrition sectors. While policies acknowledge the issue, they fail to promote synergy due to the . absence of joint task forces or working groups Stakeholder workshop feedback confirmed that climate forums rarely include nutrition experts, and nutrition committees lack climate representation. To address this gap, the report recommends establishing a formal coordination mechanism to bridge silos and enable effective multi-sectoral collaboration.

- **Integrated Monitoring Systems:** Invest in integrated monitoring systems that include climatenutrition indicators to assess policy effectiveness. Include tools such as district-level vulnerability maps overlaying malnutrition data with climate risk exposure (e.g., drought and flood zones), and incorporate child nutrition metrics (stunting, wasting) into early warning and response systems.

Justification: The report notes fragmented monitoring systems, with no integration of climate and nutrition indicators (Level 1-2). This limits evidence-based planning, as seen in the siloed Nutrition Dashboard and CCIT. The recommendation directly tackles this gap by proposing a unified platform with a focus on vulnerable regions highlighted in the report.

- **Integrated Climate-Nutrition Information Platform:** Build on the existing Food Systems Dashboard to better link climate and nutrition data by integrating accessible datasets such as, weather, crop yields and nutrition indicators for cross-analysis. This would enable policymakers, researchers and practitioners to make informed decisions on issues like food storage, supply logistics and nutrition sensitive emergency planning.

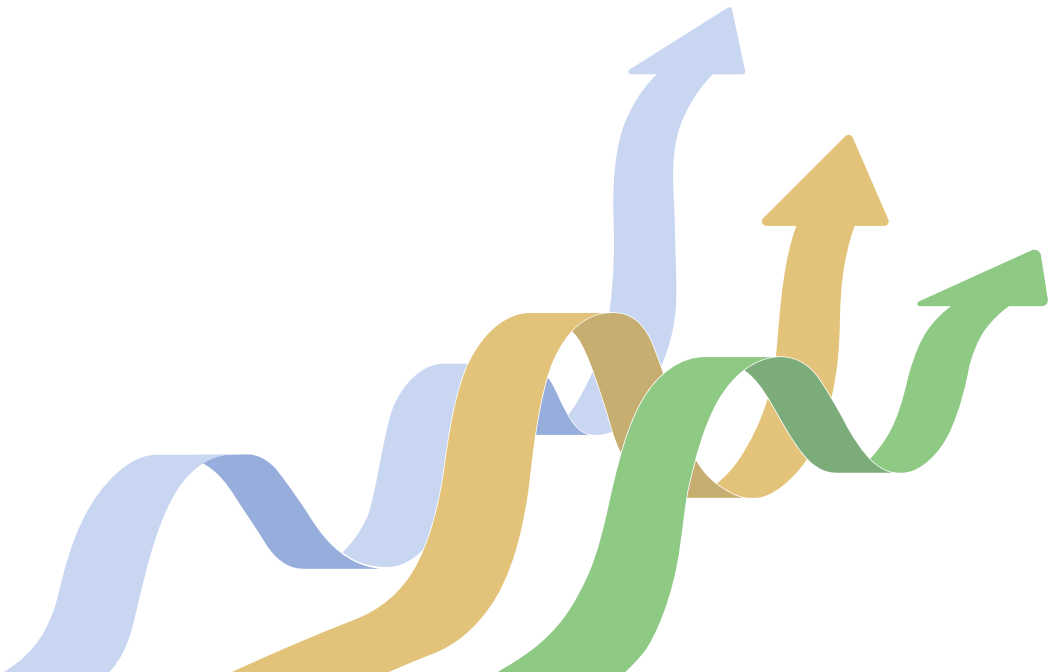
Justification: As highlighted in the report, data platforms like the Nutrition Dashboard and CCIT are siloed and do not support integrated analysis-limiting evidence-based planning.

- **Strengthen Capacity for Climate-Nutrition Integration:** Enhance technical capacity of government staff and stakeholders to implement nutrition-sensitive climate strategies and utilize integrated data systems effectively. Training should cover food system resilience, including sustainable storage, transport, and local food processing.

Justification: The report finds limited capacity for integrated analysis and absence of joint training on climate-smart nutrition. Capacity building is needed to operationalize cross-sectoral plans.This recommendation addresses the capacity gap by specifying training areas and partners, responding to the CHVA and stakeholder calls for enhanced technical skills.

- **Mobilize Cross-Ministerial Financing:** Identify opportunities for joint resource mobilization of climatenutrition integrated initiatives such as resource allocation between relevant ministries (Health, Climate Change, Food Security, Planning) and development partners. Integrated programs that deliver cobenefits, such as investments in food storage infrastructure, community-based nutrition gardens, cold chain development, or local food packaging units.

Justification: The review of GCF and World Bank projects showed that while climate investments exist, nutrition outcomes are not budgeted or tracked. Cross-ministerial financing will ensure nutrition is mainstreamed in climate investments.



6. ANNEX

ANNEX 1: STAKEHOLDER MAPPING AND ANALYSIS

Based on desk review, the key national/provincial-level stakeholders from government, private sector, non-profit organizations, bilateral organizations, donor organizations, think tanks, academia, research etc., have been listed in the table below.

Table 9: Stakeholder Mapping

S. No.	Stakeholders Description	Focus Area	Primary Role / Mandate	Power/Influence 50
Government Ministries at National and Federal Level				
1	Ministry of National Food Security and Research	Agriculture & Food Security	Leads national food security and agriculture policies	**High -** holds policy and regulatory authority over agriculture and food security, directly shaping integration of CSA and nutrition interventions.
2	Pakistan Agricultural Research Council	Agriculture Research	National R&D on crops, soil, water, bio-fortification	**High -** influences agricultural research agenda and technology adoption nationwide, with capacity to drive biofortified and climate-resilient crop innovations.
3	National Food Systems Monitoring Committee	Food Systems Governance	Monitors national foodsystems indicators	**Medium -** advisory in nature; provides data and coordination but limited decision-making power.
4	Ministry of National Health Services, Regulations & Coordination	Health & Nutrition	Health and nutrition policies and surveillance	**High -** central authority for nutrition programming and health sector alignment with climate strategies.
5	Ministry of Climate Change & Environmental Coordination	Climate Change & Environment	Climate policies and adaptation planning	**High -** primary driver of climate action policies with strong cross-sectoral convening power.
6	Federal Flood Commission	Disaster Management & Water	Coordinates national flood management	**Medium -** key technical body, influences water and flood resilience investments.
7	Federal Board of Revenue	Finance & Trade	Manages taxation, trade incentives	**Medium -** can incentivize or disincentivize climate-nutrition investments via fiscal policy.

[50] **High:** Decision-makers or funders with direct control or significant leverage over climate-nutrition policies or resource allocation (e.g., federal ministries, UN agencies, donors).
Medium: Actors influencing through technical input, implementation, or research. Their influence grows when they collaborate with high-power actors (e.g., NGOs, academia, provincial departments).
Low: Grassroots actors or facilitators without policy-making authority but crucial for community-level implementation and accountability (e.g., CBOs, community elders/leaders).

8	Ministry of Commerce	Trade & Markets	Regulates food/agriculture trade	**Medium -** impacts value chains and import/export policies that affect nutrition-sensitive food systems.
9	Ministry of Education	Education & Awareness	Curriculum, school feeding	**Medium -** indirect influence through embedding climatenutrition messages in education and programs.
10	Ministry of Finance	Finance & Budgeting	Budget allocations and planning	**High -** critical authority for funding allocation and mobilizing resources for climate-nutrition initiatives.
11	Ministry of Information & Broadcasting	Communication	Public messaging	**Medium -** strong outreach influence through nationwide campaigns but no policy authority.
12	Ministry of Interior	Governance & Coordination	Operational security and interprovincial support	**Medium -** enabling role; facilitates inter-provincial operations and field access.
13	Ministry of Planning, Development & Special Initiatives	Planning & Policy	Development planning and SDG integration	**High -** key influence on multi-year plans and integration of climate-nutrition objectives into national agendas.
14	Ministry of Poverty Alleviation & Social Safety	Social Protection	Safety nets and cash transfers	**High -** controls programs that can directly address nutrition vulnerabilities exacerbated by climate shocks.
15	National Disaster Management Authority	Disaster Management	National disaster preparedness	**High -** operational authority to integrate nutrition-sensitive preparedness and response at scale.
16	Pakistan Bureau of Statistics	Data & Statistics	National data and monitoring	**High -** critical evidence provider; shapes policy through data that guides climate-nutrition decision making.

Government Departments at Provincial Level				
17	Provincial Agricultural Research Institutes	Agriculture Research	Region-specific R&D	**Medium -** influence within provinces through contextspecific innovation.
18	Provincial Health Departments	Health & Nutrition	Provincial health/nutrition services	**High -** implementers of nutrition-sensitive interventions and climate-health initiatives at provincial level.
19	Provincial Livestock & Dairy Development Departments	Livestock Systems	Animal health, dairy support	**Medium -** sector-specific influence over climate-resilient livestock strategies.
20	Provincial Environment & Climate Change Departments / Provincial Environment Protection Agencies	Climate & Environment	Provincial climate adaptation	**High -** directly shape local climate adaptation plans with nutrition co-benefits.
21	Provincial Agricultural Extension Services	Agriculture Services	Farmer support & advisories	**Medium -** frontline advisory role; influence on adoption of climate-smart practices.
22	Provincial Forest Departments	Natural Resources	Forest management	**Medium -** indirect influence via ecosystem services and land management.
23	Provincial Disaster Management Authorities	Disaster Management	Provincial disaster response	**High -** operational authority for localized anticipatory actions and nutrition-sensitive responses.
24	Provincial Food Authorities	Food Regulation	Food safety and quality	**Medium -** enforce standards locally; moderate influence on nutrition outcomes.

25	Provincial Education Departments	Education & Awareness	Provincial schools & curriculum	**Medium -** influence via local education programs and awareness campaigns.
26	Provincial Planning & Development Departments	Planning & Policy	Provincial planning and budgets	**High -** strong influence over resource allocation for integrated initiatives.
27	Provincial Social Welfare Departments	Social Protection	Local safety nets and welfare	**Medium -** implement local-level programs that can integrate nutrition objectives.
Bilateral/Donor Organizations				
28	FAO, World Bank, UNICEF, WHO, ADB, EU, GCF	Both (Climate & Nutrition)	Provide funding, global guidance and technical assistance on climatenutrition to national institutions.	**High -** Their strategic funding and international influence shape national priorities and implementation pathways.
NGOs/Civil Society				
29	Action Against Hunger, Global Alliance for Improved Nutrition, IFPRI, Nutrition International	NutritionFocused	Rural development, nutrition. They develop and implement nutrition-specific and nutrition-sensitive programs.	**Medium -** Implement programs and influence policy through evidence and outreach, without formal authority.
30	Aga Khan Rural Support Programme, Islamic Relief Pakistan, Red Crescent Society, Sarhad Rural Support Programme, WHH, WWF, HANDs, Muslim Hands, National Rural Support Programme, Balochistan Rural Support Programme, Punjab Rural Support Programme	Both (Climate & Nutrition)	Community development, resilience. Deliver programs at the community level; advocate policy change; bridge gaps in service delivery.	**Medium -** Implement programs and influence policy through evidence and outreach, without formal authority.

Private Sector				
31	Engro, Fauji Fertilizer, Nestle, PepsiCo, Unilever, local food businesses	Both (Climate & Nutrition)	Innovate in CSA and nutrition products, contribute through CSR.	**Medium -** Influence is market-driven and indirect, shaping consumer behavior and sector practice.
Think Tanks				
32	SDPI, Consortium for Development Policy Research, Global Change Impact Studies Centre	Both (Climate & Nutrition)	Generate evidence, assess policy gaps, and advocate for integrated climate-nutrition governance.	**Medium -** These institutions influence policies through research and engagement, but do not directly implement or regulate.
Academia & Research				
33	UAF, Agriculture University Peshawar, COMSATS, NUST, Quaid-e-Azam University	Both (Climate & Nutrition)	Academic research, climatenutrition education. These institutions are key players in setting environmental policy frame.	**Medium -** They shape thinking and generate data that informs decision-making, but they do not execute policy.
Community-Based Actors				
34	Community Support Groups, Youth Groups	Both (Climate & Nutrition)	Mobilize grassroots, deliver BCC and early response locally.	**Low -** Strong on-ground presence but limited in shaping strategic decisions or policies.
Media Platforms				
35	TV, radio, social media and newspapers	Both (Climate & Nutrition)	Disseminate information, raise public awareness, and influence public perception on climate and nutrition. Media platforms have strong reach but limited formal role in decision-making or policy formulation.	**Low -** These stakeholders play a supporting role, primarily at the local level, or in communication and outreach, with limited influence over formal policy

ANNEX 2: NATIONAL AND PROVINCIAL LANDSCAPING EXERCISE

Landscaping Exercise_Final.xlsx

ANNEX 3: ACTION PLANS

15062025_Action Plan_Sindh - V1.docx

Action Plan Sindh

15062025_Action Plan_GB - V1.docx

Action Plan Gilgit-Baltistan

ANNEX 4: REFERENCES

Acumen. (2023). Acumen Climate Action Pakistan Fund (ACAP). Green Climate Fund (GCF) Proposal. https://www.greenclimate.fund/document/acumen-climate-action-pakistan-fund

Capital Development Authority / UN-Habitat. (2014). Islamabad, Pakistan: Climate Change Vulnerability Assessment. United Nations Human Settlements Programme (UN-Habitat). https://unhabitat.org/islamabad-pakistan-climate-change-vulnerability-assessment

Chaudron,Myriam Mireille Veronique. Concept Project Information Document (PID) - Sindh Livestock and Aquaculture Sectors Transformation Project - P179003 (English). Washington, D.C. : World Bank Group http://documents.worldbank.org/curated/en/099042723021515595

Climate Risk Country Profile: Pakistan (2021): The World Bank Group and the Asian Development Bank. http://sar-climate.adpc.net/wp-content/uploads/2022/05/PK-OTH-CS-55.pdf

Food and Agriculture Organization of the United Nations (FAO). (2019). Transforming the Indus Basin with Climate Resilient Agriculture and Water Management. Green Climate Fund (GCF) Funding Proposal FP108. https://www.greenclimate.fund/document/transforming-indus-basin-climate-resilient-agricultureandwater-management

Global Alliance for Improved Nutrition (GAIN), Food and Agriculture Organization (FAO), Columbia Climate School, & Johns Hopkins University. (2024). Pakistan Food Systems Dashboard. Retrieved May 8, 2025, from https://www.foodsystemsdashboard.org/countries/pak/fsci

Government of Azad Jammu & Kashmir. (2017). AJ&K Climate Change Policy 2017. Climate Change Center, Planning & Development Department. https://pndajk.gov.pk/uploadfiles/downloads/CC%20AJK%20Policy%202017.pdf

Government of Balochistan. (2024). Balochistan Climate Change Policy 2024. Planning and Development Department.https://transparency.org.pk/Climate-change-Policies/Balochistan-Climate-ChangePolicy2024.pdf

Government of Gilgit-Baltistan. (2023). Gilgit-Baltistan Climate Change Adaptation Action Plan 2023. Gilgit-Baltistan Environmental Protection Agency. https://pmrugb.gov.pk/dipatch/GB%20CC%20Adaptation%20Action%20Plan%20-2023.pdf

Government of Khyber Pakhtunkhwa. (2022). Khyber Pakhtunkhwa Climate Change Action Plan 2022. Climate Change Cell, P&D Department. https://few.kp.gov.pk/uploads/2022/09/KP_Climate_Change_Action_Plan_ENGLISH.pdf

Government of Pakistan. (2018). National Food Security Policy 2018. Ministry of National Food Security and Research. https://pbit.punjab.gov.pk/system/files/National%20Food%20Security%20Policy%202018.pdf

Government of Pakistan. (2018). Pakistan Multi-Sectoral Nutrition Strategy 2018-2025. Ministry of Planning, Development & Reform.https://www.exemplars.health/-/media/files/egh/resources/anemiaamong-wra/pakistan/pak_2018_pakistan-multi-sectoral-nutritionstrategy.pdf

Government of Pakistan. (2019). Pakistan Dietary Guidelines for Better Nutrition. Ministry of Planning, Development & Reform and Food and Agriculture Organization (FAO). https://pc.gov.pk/uploads/report/Pakistan_Dietary_Nutrition_2019.pdf

Government of Pakistan. (2021). National Climate Change Policy 2021. Ministry of Climate Change. https://www.mocc.gov.pk/SiteImage/Policy/NCCP%202021.pdf

Government of Pakistan. (2021). National Pathways for Food Systems Transformation. Ministry of National Food Security and Research. https://summitdialogues.org/wp-content/uploads/2021/09/National-Pathways-for-Food-Systems-Transformation-in-Pakistan-Sep152021.pdf

Government of Pakistan. (2021). Pakistan Updated Nationally Determined Contribution (NDC) 2021. Ministry of Climate Change. https://mocc.gov.pk/SiteImage/Misc/files/PakistanUpdatedNDC2021compressed.pdf

Government of Pakistan. (2022). Pakistan Adolescent Nutrition Strategy 2022-2030. Ministry of Planning, Development & Special Initiatives and UNICEF. https://www.scribd.com/document/730266706/PakistanAdolescent-Nutrition-Strategy

Government of Pakistan. (2023). Pakistan National Adaptation Plan (NAP). Ministry of Climate Change. https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Pakistan.pdf

Government of Pakistan. (2024). Climate Change Risk Assessment: Karachi City - K-CAP. The Urban Unit, C40 Cities, and UNDP Pakistan. https://urbanunit.gov.pk/Download/Project%20files/8/Deliverable%20D_CCRA_FD_17042024.pdf

Government of Pakistan. (2025). National Disaster Management Plan 2025. National Disaster Management Authority (NDMA). https://www.ndma.gov.pk/storage/plans/March2025/sps3g997GvbYIOEpwvKw.pdf

Government of Punjab. (2024). Punjab Climate Change Policy & Action Plan. Planning and Development Board, Punjab.https://ndrmf.pk/wp-content/uploads/2024/08/Punjab_Climate_Change_Policy_Action_Plan__1723738609_compressed.pdf

Government of Sindh. (2022). Sindh Climate Change Policy 2022. Sindh Environmental Protection Agency. https://www.scribd.com/document/769358495/Sindh-Climate-Change-Policy-2022-Final

HarvestPlus & International Food Policy Research Institute (IFPRI). (2022). The journey of scaling in Pakistan: Zinc-enriched biofortified wheat. HarvestPlus. https://www.harvestplus.org/wpcontent/uploads/2022/03/The-Journey-of-Scaling-in-Pakistan.pdf

Ministry of Climate Change. (n.d.). Pakistan Climate Portal. Retrieved May 9, 2025, from https://ccit.pk/

Ministry of Climate Change. (2021). Pakistan NDC Implementation Framework Template: Provincial Information and Roadmap. Government of Pakistan. https://epakp.gov.pk/wpcontent/uploads/2022/07/NDC-Implementation-framework-template.pdf

Ministry of National Food Security & Research, Government of Pakistan. (2025). Year Book 2023-24. Economic Wing, Ministry of National Food Security & Research. https://www.mnfsr.gov.pk/SiteImage/Misc/files/Year%20Book%2023-24.pdf

Rana, A. W., & Gill, S. (2021). Pakistan: Strategy to promote climate smart agriculture practices. International Food Policy Research Institute. Funded by the Consortium for Scaling-up Climate Smart Agriculture in South Asia. https://cgspace.cgiar.org/server/api/core/bitstreams/17bec81f-dbd3-4a2d-b2bb750a484f93e4/content

Ministry of National Health Services, Regulations & Coordination. (n.d.). Nutrition Dashboard. Retrieved May 9, 2025, from https://shorturl.at/7BjFl

UNICEF & Government of Pakistan. (2019). National Nutrition Survey 2018: Key Findings Report. UNICEF Pakistan. https://www.unicef.org/pakistan/media/1951/file/Final%20Key%20Findings%20Report%202019.pdf

World Bank Group. Benin - Country Climate and Development Report (English). Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/099120423163539177

World Bank. (2024). Climate and Health Vulnerability Assessment: Pakistan. International Bank for Reconstruction and Development / The World Bank. https://documents1.worldbank.org/curated/en/099070324142031034/pdf/P50199317ac51302718f4d173358 3b5c276.pdf

World Bank. (2024). Crisis-Resilient Social Protection Program - Additional Financing: Program Paper (Report No: PAD5619). International Development Association. https://documents1.worldbank.org/curated/en/099053124122038063/pdf/BOSIB1c8dae7ae03d181981243 d144d13c8.pdf

World Bank. Pakistan - Country Partnership Framework for the Period FY26 Up to FY35 (English). Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/099121324161568318

WWF-Pakistan. (2023). Recharge Pakistan: Building Pakistan's Resilience to Climate Change through Ecosystem-based Adaptation in the Indus Basin. Green Climate Fund (GCF) Funding Proposal. https://www.greenclimate.fund/document/recharge-pakistan-building-pakistan-s-resilience-climatechange-through-ecosystem-based-1