Securing the food systems of Asian Mega-Deltas for climate and livelihood resilience (AMD)

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Proposal

November 23, 2021

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Glossary

Acronyms

Summary table

Initiative name	Securing the food systems of Asian Mega-Deltas for climate and livelihood resilience (AMD)
Primary Action Area	Resilient Agrifood Systems
Geographic scope (Regional)	Ganges Delta (Bangladesh, India) Irrawaddy Delta (Myanmar) Mekong Delta (Cambodia, Vietnam)
Budget	US$30,000,000

1. General information

Securing the food systems of Asian Mega-Deltas for climate and livelihood resilience (AMD)

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2. Context

2.1 Challenge statement

Home to 177 million people – 36% of them poor[1] – the densely populated Asian Mega Deltas are biodiverse, fertile and productive food baskets dominated by rice, fisheries and aquaculture that also support millions beyond the deltas. Asian Mega Deltas are the world´s most important rice-growing areas. In Vietnam, 52% of rice[2] (and 95% of exported rice), 60% of fruits and 70% of seafood[3], the world's major staple foods, are produced in the Mekong Delta. The Ayeyarwady Mega-Delta is where Myanmar grows about 70% of its rice and aquaculture[4]. Ganges-Brahmaputra-Meghna (GBM) Delta in Bangladesh and the Indian state of West Bengal is known as the Green Delta because it is one of the most fertile regions in the world.

However, delta food systems are reaching a significant tipping point[5]. At the same time that governments look to deltas to achieve national development goals for food security, nutrition and poverty alleviation[6], the tens of millions of small-scale producers who they hope will achieve this also face grave risks from the impacts of climate change, aggravated by the effects of inappropriate development pathways[7]. Recent data[8] reveals that the Asian Mega Deltas are likely to be hit by serious impacts of climate change, including more frequent and more intense floods, salinization, water shortages and climate extremes that will slow down economic growth, further erode food security, and trigger new poverty traps and emerging hotspots of hunger[9].

As an example, saltwater intrusion, related to rising sea level, is becoming progressively more severe and affecting increasing areas of crop production. The GBM Delta is already impacted by sea level rise and saltwater intrusion has also been reported to impact agricultural productivity. Furthermore, in 2019–20, saline intrusion in the Mekong Delta resulted in estimated production losses of about 460,000 hectares. These and other stresses have led to an annual loss of GDP of 6% in Southeast Asia – over twice the global average and could severely cripple the vital economic activities linked to these systems.

The challenge addressed by the AMD Initiative is to remove system barriers at community, national and regional levels to facilitate scaling of existing/emerging technologies and practices for transforming food systems towards greater climate resilience. This is the underlying precept of One CGIAR's Securing ***the Food Systems of the Asian Mega-Deltas for Climate and Livelihood Resilience (AMD)*** Initiative, which aims to support the creation of resilient, inclusive, and productive deltas. At the same time, transformed food systems need to provide pathways out of poverty for millions, as they have done previously in certain parts of the Asian Mega-Deltas. As accelerated change is risky, the AMD Initiative also addresses challenges to nutrition security, financial investment, gender equity and social inclusion, and to the natural resources on which the resilience of the entire system depends[10]. It does so by building strong policy-science partnerships working with diverse actors and aligning them towards common goals.

2.2 Measurable 3-year (end-of-Initiative) outcomes

Assuming full budget allocation for each year of the Initiative, AMD Initiative aims to achieve the following outcomes:

EoI Outcome 1: By 2025, a network of inclusive Learning Alliances comprised of at least 200 stakeholder communities and 30 organizations in each delta and supported by at least three national/sub-national policies, will scale up diversification of agrifood systems in deltas, to

accelerate adaptation by 150,000 smallholders and improve management of 100,000 hectares of land.

EoI Outcome 2: By 2025, national ministries and major NGOs in at least three countries use AMD co-produced knowledge and evidence to table at least three nutrition sensitive interventions to reduce mortality, DALYs and micronutrient deficiencies, for 20,000 producers (80% women) and 100,000 consumers.

EoI Outcome 3: By 2025, digital climate advisory and bundled services provided by public and private sector partners will be used by ≥ 0.8 million smallholders (≥ 29% women), with at least one financing partnership plan established to assure sustainability for further scaling.

EoI Outcome 4: By 2025, at least three national governments or international development partners work with grassroots actors including marginalized women and youth to co-design gender equitable and socially inclusive joined-up natural resources and food systems governance policies or strategies.

EoI Outcome 5: By 2025, high-level policymakers and development partners in at least two deltas involved in knowledge integration networks make public statements on the importance of One CGIAR and AMD and engage with AMD to help design climate adaptation-oriented policies, projects and investment plans with the nominal value of at least US$1.8 billion.

The EoIs will further be refined during the inception phase when budget allocation is definite and detailed activities will be determined.

2.3 Learning from prior evaluations and impact assessments (IA)

The design of One CGIAR's AMD builds on evaluations of and learnings from the former CGIAR Research Programs, especially the Research Programs on Climate Change, Agriculture and Food Security (CCAFS), Water, Land and Ecosystems (WLE), Rice (RICE) and Fish Agri-Food Systems (FISH). It responds to the recommendations of the CGIAR Research Program 2020 Reviews and 2021 Synthesis of Evaluative Evidence: Toward One CGIAR. Examples of major findings and responses include:

- A highly inclusive Initiative design process and structure designed to avoid research silos through inter-center teams in each WP and enables outcomes of other Initiatives by acting as a knowledge integrator.
- Purposeful inclusion of local partners in co-design and implementation of all research activities to ensure intrinsic capacity development.
- Incorporation of key successes of the CRPs in order to achieve fast outcomes and advance the most relevant science for development, e.g., CCAFS climate risk maps.
- Embracing MELIA as a dynamic research tool for adjusting and improving the impact pathway.
- Fostering partnerships for impact with national governments and strategic development partners by nurturing trust and operating "eye-to-eye", e.g., through learning alliances.

One CGIAR's AMD further builds on partnerships and learnings from various bilateral projects in the focus regions. Key projects include: Feed the Future Innovation Lab for Collaborative Research on Sustainable Intensification in the Polders of Coastal Bangladesh (SIIL-Polder); De-RISK Southeast Asia funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU); Development of Rice-Fish Systems in the Ayeyarwady Delta and Mekong Delta funded by ACIAR; Closing the Yield Gaps in Asian With

Reduce Environmental Footprints (CORIGAP) funded by the Swiss Agency for Development Cooperation (SDC) in six countries including Myanmar and Vietnam; the Feed the Future IPM Innovation Lab research on Ecologically based participatory IPM for rice in Cambodia.

2.4 Priority-setting

Prioritizing the Mega Deltas of Asia

As a regional Initiative, AMD was designed to ensure close alignment with the new CGIAR research strategy of "transforming food, land and water systems in a climate crisis". The Mega-Deltas of Asia were selected as a geographical priority, as an exemplar of food systems in a highly threatened environment where land, water management and food production cannot be separated. Coastal agricultural land and ecosystems in the region account for some of the world's major food production areas, providing livelihoods for rural communities and contributing very significantly to domestic food supplies, as well as being a major source of exports[11]. These coastal areas and deltas in Asia are becoming increasingly vulnerable to the growing threat of climate change, and experience frequent flooding, sea level rise, saline intrusion, cyclones, and coastal inundation.

Country and delta selection prioritization

AMD identified deltas and countries in Asia with the highest potential for generating significant outcomes, particularly taking into consideration: (1) Significance to national and regional food security, (2) Vulnerability to climate change impacts, (3) Level of economic development, (4) Linkages to previous CGIAR work and research upon which to build, (5) Alignment with donor priorities and interests, (6) Availability of national and CGIAR experts in country, and (7) Strong willingness of stakeholders to collaborate and partner with AMD.

Based on these criteria, the Ganges, Irrawaddy and Mekong mega deltas, located in Bangladesh and India, Myanmar, and Vietnam and Cambodia, respectively, were chosen. These deltas and countries are considered a crucial food resource at the national and regional levels and are highly vulnerable to impacts of climate change[12] as illustrated in the table below. There is also a strong CGIAR presence in these countries (availability of at least two CGIAR offices per country) and their selection takes into account previous and ongoing Agriculture Research for Development (R4D) studies and learnings on which AMD will build.

Delta	Country	Main agriculture product	Main challenges	Climatic risks	Vulnerability due to sea-level rise
Ganges	Bangladesh, India	Rice, aquaculture	Urbanization, salinity, water management	Extreme	Extreme
Irrawaddy	Myanmar	Rice, aquaculture	Water management	Extreme	Low
Mekong	Cambodia, Vietnam	Rice, aquaculture, vegetables and fruits	Saltwater intrusion, water management	Moderate	Extreme

Note: Table adapted from Schneider, 2020.

Work Package and Innovation prioritization

The design of the different Work Packages including the development of research questions, methods, and innovations was an iterative process. This involved comprehensive reviews of scientific literature, alignment with national priorities and strategy documents, as well as conducting surveys and consultations with national and regional partners, and reference group members within the CGIAR. Work Packages were continually reviewed to ensure responsiveness to the key challenges of the different deltas while taking into account the capabilities, knowledge, and assets of the CGIAR. Further detail on the prioritization process and justification for the development of Work Packages can be found in Annex 2.4..

2.5 Comparative advantage

AMD is well positioned to address the defined challenge and achieve impact through its innovations and partnerships as illustrated by:

- **Strong buy-in achieved from local and regional stakeholders** through nine engagement events in 2020 and 2021, totaling more than 400 participants, from multiple sectors spanning demand, innovation and scaling. With stakeholder inputs incorporated and by building on established partnerships with governments and development partners, AMD is ready to initiate impactful joint adaptive research immediately.
- **Working in established networks with government, civil society, financial institutions and development partners** to identify targeted financial investment opportunities to promote adoption of inclusive, climate resilient, environmentally responsible practices. These include the initial operation of digitally driven agro-climatic advisories and proven options for circular agro-economy.
- **Working in advancing economies with stable institutions and demonstrated implementation capability** will ensure rapid diffusion of innovations and impact. R4D in Vietnam will address challenges in a middle-income country context that will be relevant for current low-income countries in the near future.
- Strong emphasis on the **co-production of knowledge and co-design and implementation of interventions and policies through multi-stakeholder processes** to build individual and institutional capacity, and enhance uptake of new science outputs.
- The CGIAR has a broad range of **expertise across disciplines and strong convening capabilities**, enabling **lessons learnt elsewhere in the region** to be effectively transferred to the integrated food-land-water context of the Mega-Deltas.

2.6 Participatory design process

National stakeholder consultations

The design of the AMD proposal is strongly demand-driven. AMD was initially built on the **Two Degree Initiative (2DI),** a CGIAR Initiative to accelerate research and development on climate change through nine regional challenges. With the Asian Mega-Deltas challenge identified as one of the nine regional challenges, **five demand-mapping and priority-setting workshops** were held in 2020 with 168 participants involved in activities in the Ganges-Brahmaputra, Mekong and Ayeyarwaddy Deltas.

Stakeholders from these workshops and consultation processes confirmed the identification of increasing climate resilience in the mega deltas as a core research problem. Key insights gained from the listening events were summarized in a 2DI AMD report and include local partners requesting a strong emphasis on adaptive research focusing on new technologies and practices, purposeful inclusion of local communities in research activities (e.g. to leverage local knowledge) and a coherent research-development-deployment approach through which

targeted reforms meet needs on the ground. These insights and the proposed R4D strategy were used to build the AMD pre-concept note.

After adjustment of the pre-concept, the value proposition was validated in **four national consultation workshops** with more 250 participants organized in 2021 for (1) Cambodia, (2) Vietnam, (3) Bangladesh and India and (4) Myanmar. Workshops consist of presentations and breakout sessions. The first three workshops brought together a range of stakeholders including policymakers, development workers, researchers, and academicians working for agricultural R4D while the latter consultation involved only those from NGOs and civil society and was done in coordination with the Resilient Aquatic Food Systems (RAqFS) IDT. Stakeholders re-confirmed their endorsement and commitment to the AMD Initiative during these workshops, with key stakeholders from the five focus countries providing letters of support, compiled in Annex 2.6.1.

IDT core and reference group member writeshops

Taking into account the inputs from the national consultation workshops, **three writeshops were held with core IDT members and expanded reference groups** for the Ganges, Irrawaddy, and Mekong deltas, comprising 16 colleagues representing eight CG centers, to synthesize key insights and provide an initial theory of change (TOC) for the different Work Packages. Potential innovation and scaling partners were engaged during the development of the TOCs of individual Work Packages. The proposal was also developed ensuring alignment with national development plans, strategies and priorities, which are specified and included in Annex 2.6.2.

Bilateral and multilateral donor consultations

AMD had coordination calls with multilateral and bilateral institutions to present the proposal and obtain initial feedback. Donors shared their development priorities in the different deltas and provided recommendations on how to ensure the AMD proposal aligns well with their ongoing and planned Initiatives, details of which can be found in Annex 2.6.3.

Potential investors engaged by AMD	
Bilateral donors	**Multilateral donors & foundations**
• Australia (ACIAR) • Germany (GIZ/BMZ) • South Korea (RDA) • Switzerland (SDC) • USA (USAID)	• Asian Development Bank • Bill and Melinda Gates Foundation • World Bank

Coordination with other CGIAR Initiative Design Teams

AMD held initial discussions with 16 IDTs across the three different Action Areas, considered to be most relevant to AMD, to identify geographic and thematic synergies and potential modalities for cooperation. IDTs engaged by AMD are outlined in the table below and potential areas for collaboration as outlined in Annex 2.6.4.

CGIAR IDTs engaged by AMD		
Resilient Agrifood Systems	**Systems Transformation**	**Genetic Innovation**
High synergies		
• RAqFS • EiA • TAFSSA	• HER+ • Digital Technologies • ClimBeR • MITIGATE+	

	• Resilient Cities • NPS • NEXUS Gains • Foresight and Metrics • ShiFT	
Medium-low synergies		
• One Health • Plant Health • Ukami Ustawi		• SeEdQUAL • Market Intelligence and Product Profiling

Note: Full CGIAR IDT titles are found in Annex 2.6.4

High profile events

Awareness of the AMD IDT and the key challenges it addresses is high among country partners and internationally due to participation in high-profile events in partnership with the 'Living Deltas Hub'. Side-events at three international conferences have been organized at (1) Gobeshona 2021, (2) Amsterdam Water Week and (3) COP26. Interaction and discussions during these events helped to further promote the Initiative.

2.7 Projection of benefits

AMD will contribute to all five CGIAR Impact Areas during 2022–2030, in keeping with our systemic approach to deltaic development and resilience. Moreover, the Initiative brings together key elements of development in deltas to enhance synergies and reduce trade-offs: **WP1** establishes adaptation processes that recognize local synergies; **WP2** ensures that gains in productivity do not prejudice nutrition; **WP3** supports investment by the poor and by women; **WP4** pursues 'joined up' governance of food systems, as well as equitable gains for marginalized women, youth and smallholders relying on diverse natural resources (NR); **WP5** provides strategic oversight of multiple drivers of change in deltas. We have not included these in our assessment of projected benefits.

We also anticipate synergies with other Initiatives as mentioned in the TOC (section 3) as well as in Annex 2.6.4. However, we have not assumed additional impact from these synergies in this set of projections, to ensure estimates are conservative and to avoid double counting between Initiatives. All details of the calculations and other references used can be found in Annex 2.7.

The projections below transparently estimate reasonable orders of magnitude for impacts which could arise as a result of the impact pathways set out in the Initiative's theories of change. Initiatives *contribute* to these impact pathways, along with other partners and stakeholders. For each Impact Area, projections consider breadth (numbers reached), depth (expected intensity of effect per unit) and probability (a qualitative judgement reflecting the overall degree of certainty or uncertainty that the impact pathway will lead to the projected order of magnitude of impact). Projections will be updated during delivery to help inform iterative, evidence-driven, dynamic management by Initiatives as they maximize their potential contribution to impact. Projected benefits are not delivery targets, as impact lies beyond CGIAR's sphere of control or influence.

Nutrition, health and food security

# of people benefiting from relevant CGIAR innovations: People in AMDs are anticipated to benefit from improved nutrition via 3 pathways: (1) directly, via nutrition sensitive interventions (WP2); (2) indirectly, via nutrition sensitive policies (WP2); (3) indirectly, via higher incomes and averted income losses from enhanced agricultural performance (WP1), adoption of Digital Climate Advisory Services (DCAS) (WP3), and

more inclusive cross-sectoral governance (WP4). We limit estimates to the direct pathway due to insufficient data. Estimates are therefore at the lower bound of the Initiative's sphere of influence. Multiple studies demonstrate robustly the direct impacts of nutrition sensitive interventions on human nutrition and health in AMD target geographies[13]. A nutrition sensitive aquaculture program in Bangladesh is projected to reduce annual deaths by 129 per 100,000, save 9090 DALYs annually, and reduce vitamin A inadequacy prevalence by 16.8% for adopting women (age 15–50) and their children (age <=5)[14]. We assume three comparable nutrition sensitive interventions are possible and estimate end-of-Initiative (2030) impacts, based on seven years of implementation. The program could save 5,700 lives (lifesaving), 191,00 DALYs (transformative) and ensure vitamin A adequacy for 1.24 million people (substantial), 80% of whom are women aged 15–50 and 20% children <5, all at a high level of certainty.

Poverty reduction, livelihoods and jobs

# of people benefiting from relevant CGIAR innovations: Climate-smart agricultural practices (WP1), DCAS and bundled services (WP3), and nutrition sensitive interventions (WP2) will contribute to poverty reduction by boosting farm incomes and employment, but due to insufficient data, we estimate only numbers of people benefitting through the direct poverty reduction impacts of improved natural resource governance (WP4). We take involvement in fishing as a livelihood activity as a proxy for natural resource dependence. We estimate the number of fishers in AMDs to be 4.06 million[15]. This estimate accounts for known populations of fishers in deltas, national estimates of fisher numbers, and ratios of fishing households in deltas to the national population, where fishing activities are particularly heavily concentrated[16]. In Bangladesh, improved governance dramatically increased both catch volume and value, and raised the incomes of fishing households by 65%[17]. Assuming that improved natural resource governance could reach a modest 10% of natural resource dependent people in AMDs directly by 2030[18], we project substantial impacts (50% permanent increase in income) for 406,500 people, with a high level of probability.

# of people assisted to exit poverty: Increases in agricultural productivity generate economic spillovers via production, consumption, and labor market linkages[19]. Economic multipliers from agricultural growth are larger than from other sectors, and more pro-poor[20]. A 1% increase in agricultural productivity generates a 0.91% fall in the share of the population living below the lower international poverty line (US$1.90/day), while a 1% increase in agricultural GDP results in a 1.61% increase in incomes for the poorest quintile[21]. We estimate potential to extend improved agronomic practices to 2.6 million ha of cropland (WP1) based on expert elicitation (Annex 2.7). Accounting for average farm size, household size and poverty rates, 14.3 million people will benefit from increased productivity and income, of whom 1.7 million below the lower poverty line. We assume three levels of agricultural productivity gain from the literature on rice production in South and Southeast Asia (low: 4%[22], medium: 10%[23], high: 20%[24]), and estimate the potential number of hectares under each (Annex 2.7). Given an elasticity of poverty reduction of 0.91%, we estimate conservatively the number of people assisted to exit poverty to be 175,000. Probability is high given the robustness of the relationship between agricultural growth and poverty reduction, and our rigorous approach to evaluating potential for improved practices and productivity gains.

Gender equality, youth and social inclusion

# of women benefiting from relevant CGIAR innovations. We hypothesize four pathways by which women will benefit - as: Members of smallholder households gaining income from improved farming practices (WP1); Participants in nutrition sensitive

agricultural interventions (WP2); Users of DCAS (WP3); Natural resource users benefitting from improved governance (WP4). We estimate 36% of potential WP1 beneficiaries (2.07 million) and 29% of WP3 (1.41 million) will be women, based on the proportion of women in the farming workforce, adjusted for gender differentiated access to digital communications. 100% of beneficiaries of nutrition sensitive interventions (WP2) will be women aged 15–50 or children under age 5 (children assumed to account for 20%), meaning 80% (1.15 million) will be women. Direct participation in fishing (our proxy for natural resource dependence) by women is low in South Asia (3%) and Southeast Asia (12%)[25]. 37,000 women stand to benefit directly from improved fisheries governance. However, this figure excludes women benefiting indirectly through fish processing and trading, or directly from other types of improved natural resource governance (WP4). With a high level of confidence, we predict the potential for 4.67 million women (38% of 12.4 million beneficiaries) to benefit directly by 2030, in a gender responsive manner.

Climate adaptation and mitigation

# of people benefiting from relevant CGIAR innovations: We estimate numbers of people adapting to climate through use of DCAS (WP3). and improved agronomic practices (WP1). Income gains for farms receiving DCAS average 25%[26]. We estimate the potential number of people in AMDs benefiting from DCAS by 2030 to be 4.8 million, assuming conservatively that DCAS contributed to by the AMD Initiative will be used by 10% of working age delta populations employed in agriculture. This is a low estimate of potential reach as explicitly provided DCAS through digital tools/platforms have adoption rates of 10–30%[27]. With an average permanent income gain of 25%, depth of impact would fall between significant and substantial. Rates of phone penetration are high in all AMD countries (ranging from 84–143 subscriptions/100 people)[28] and smartphone use is increasing rapidly, making a high probability of success likely. However, gendered differences in phone ownership and access persist in South Asia[29]. Accounting for this gap, we assume women's uptake of advisories will be somewhat lower than men's, accounting for 29% of users of information (1.41 million people). In addition, 14.3 million people will benefit from agronomic practices that support climate adaptation (WP1), based on a potential area of 2.6 million ha under improved management, as estimated by expert elicitation, and average farm and household size.

# of tonnes CO_2 equivalent emissions avoided

The Asian Mega-Deltas are agricultural emission hotspots[30]. WP5 and WP1 will contribute to GHG reduction from rice production through output 5.2, in partnership with MITIGATE+. We have estimated GHG emissions from rice production in four countries (Vietnam, Cambodia, Myanmar, Bangladesh) and show in annex 2.7 delta-region emissions as well as national emissions because national mitigation plans (e.g., NDCs) usually do not identify specific sub-national areas. The most important mitigation options are alternate-wetting-and-drying (AWD) and mid-season-drainage (MSD) which are also present in some of the countries' NDCs. Additionally, we estimate the reduction potential of low-emissions straw management (SM) and site-specific N management. We conducted detailed climatic GIS-based suitability assessments for AWD and MSD in Vietnam and Bangladesh and imputed the suitable area in Cambodia and Myanmar. The assumption for SM is that 50% of straw is currently burnt, while 50% is incorporated into the soil. The resulting upper ceiling of mitigation is reduced by a factor of 0.6 (i.e., "cost-effective mitigation potential" following Roe et al., 2021[31] and Griscom et al., 2017[32]) to represent economic feasibility of mitigation action. We arrive at an economically feasible mitigation potential of 17 Mt CO_2e/yr for the total rice area (of which 7.81 Mt CO_2e/yr is in the delta regions) for four countries.

 # $ climate adaptation investments

AMD's climate adaptation benefits follow five pathways. (1) 0.1% (2022) to 10% (2030) of 15.73 million agricultural households in deltas (70.8 million people) are likely to invest in new adaptation activities[33,34] (estimated gains at $150 year^{-1} household^{-1}, i.e., 12.6% of farm income)[35,36], as a result of learning alliances on technologies and digital advisories, culminating in $786 million from 2022 to 2030. (2) Adoption of AMD innovations (e.g., insurance, credit schemes)[37,38] will offset losses and damage associated with extreme weather, which are projected to be 0.2% (2022) to 20% (2030) of the 0.5% GDP loss year^{-1} experienced in the AMDs[39], generating US$214 million in funds saved (35% of losses averted by affected households). (3) The Initiative's catalytic value chain actions in AMDs are anticipated to contribute to 0.01% (2022) to 5% (2030) of private (internal)[40] investment in adaptation (~3% of agricultural GDP[41,42] in the AMDs), reaching US$122.51 million by 2030. (4) Regional experience[43,44] points to an estimated 0.2% (2022) to 20% (2030) contribution to governmental investment (assumed to be 0.5% of agricultural GDP, increasing to 1.5% by 2030)[45], worth US$315.6 million by 2030 through adaptation investment planning and creation of diversified deltaic agricultural systems (increasing farm income by 16%). Finally, (5) evidence suggests that AMD's innovations will shape 2.5% (2022) to 50% (2030) of multilateral agricultural development investments (growing 10% year^{-1} from US$0.06 billion to US$0.1 billion in the AMDs[46]), worth $385 million (resulting in 20% increase in farm income). The aggregate benefits from these pathways are anticipated to be worth US$1.82 billion by 2030.

Environmental health and biodiversity

# of hectares under improved management:

AMD addresses soil health, biodiversity, and ecosystem services mainly through WP1, WP4 and WP5. The main pathway for achieving environmental benefits includes fine-scale land suitability assessment[47] to identify diverse agri-production options. AMD will target and scale resource conserving practices at the farm- and landscape level through improved agronomy[48] (managing soil carbon, nutrient management[49], salinity management[50], crop choice[51], reducing agrochemical use), improved rice-fish systems[52], appropriate water management[53], sustainable intensification with diverse crops[54], and climate-smart adaptation planning tools[55]. Based on prior project experience, social learning[56]is to encourage the adoption of innovations[57] and reduce trade-offs between environmental objectives and rural livelihoods. With experience from past[58] and building on ongoing[59] research and development initiatives, we expect to achieve ~100,000 hectares area under improved management by 2024 and at least 2.6 million hectares by 2030. In some deltas, the ongoing initiatives like "1 must 5 reductions" in the Mekong, and the 2100 Delta Plan in Bangladesh assure aligned governmental support that will increase adoption rates with a high certainty for these approaches. However, the medium uncertainties in the Irrawaddy lead to an overall rating of medium to high probability of achieving these targets. Finally, we anticipate a high degree of synergies with other IDTs, especially SeEdQUAL, RAqFS, EiA, Digital Systems, ClimBeR and TAFSSA, to further add to the environmental benefits.

Impact Area	Indicator	Breadth	Depth	Probability
Nutrition, health & food security	# people benefiting from relevant CGIAR innovations	5700 people (80% women)	**Lifesaving** (5,700 mortalities avoided)	**High:** 50%–80% expectation of achieving these impacts by 2030
		191,000 people (80% women)	**Transformative** (191,000 DALYs averted)	**High:** 50%–80% expectation of achieving these impacts by 2030
		1.24 million people (80% women)	**Substantial** (health benefits from reaching vitamin A adequacy)	**High:** 50%–80% expectation of achieving these impacts by 2030
Poverty reduction, livelihoods & jobs	# people benefiting from relevant CGIAR innovations	406,500 (9% women)	**Substantial** (50% permanent increase in income)	**Moderate:** 30%–50% expectation of achieving these impacts by 2030
	# people exiting poverty	175,000 people (50% women)	-	**High:** 50%–80% expectation of achieving these impacts by 2030
Gender equality, youth & social inclusion	# women benefiting from relevant CGIAR innovations	4.67 million people (100% women)	**Gender responsive** to **gender transformative** (different needs of men and women are identified and differentially met across AMD WPs (1,2,3) and key structural barriers to gender equality and social inclusion identified and tackled (WP4))	**Moderate:** 30%–50% expectation of achieving these impacts by 2030
Climate change adaptation & mitigation	# tonnes CO_2 equivalent emissions	17 Mt	-	**Moderate:** 30%–50% expectation of achieving these impacts by 2030
	# of people benefiting from relevant CGIAR innovations	4.8 million people (29% women)	**Substantial** (50% permanent increase in income)	**High:** 50%–80% expectation of achieving these impacts by 2030
	# $ climate adaptation investments	US$1.82 billion cumulative to 2030	**Significant**	**Moderate:** 30%–50% expectation of achieving these impacts by 2030
Environmental health and biodiversity	# of hectares under improved management	2.6 million	**Significant** (0.9 million hectares) **Substantial** (1 million hectares) **Transformative** (0.7 million hectares)	**High**: 41–60% expectations of achieving this impact under "significant and substantial" categories by 2030 **Medium to High:** ~60% expectations of achieving this impact under "transformative" category by 2030

3. Research plans and associated theories of change (TOC)

3.1 Full Initiative theory of change

Home to 177 million people (35% of them poor) and food provider for many more, the AMDs are an immensely important element of Asian food systems that are under pressure to produce more, even while threatened by the effects of climate change. The overall goal of this Initiative is to therefore establish accelerated but balanced local adaptation of delta food systems while ensuring gender equitable, inclusive and sustainable growth. We summarize the TOC below.

Challenges
• Deltas provide home to 177m people and support the livelihoods of many more. They are under extreme pressure to increase production to meet demands for nutrition and poverty alleviation • Climate change already is impacting deltas significantly. Adaptation is vital • Deltas are extremely variable environments. Broad brush approaches are inappropriate • Deltas provide a range of ecosystem services that can be threatened by development • Current development trajectories may produce exclusionary outcomes for marginalized groups. • Delta systems require a coherent vision to ensure inclusive and resilient futures
Objectives
• Stimulate contextually appropriate development through Learning Alliances,and governance, technological and policy innovations • Adapt, diversity, and grow nutrition sensitive production systems and value chains for greater climate resilience • Assure the multi-functionality and joined up governance of delta natural resource, water, and food systems • Engage people in a gender responsive, inclusive and socially equitable manner • Manage climate risks that would otherwise impede growth and undermine resilience • Support the above through a system-wide strategic insight on complex processes in multiple deltas.
Research, Learnings, and Activities
• Establish networks of learning alliances to adapt agronomic solutions locally with communities • Analyze and model nutrient consumption and production capabilities within the system • Evaluate threats to natural resource users from siloed governance and inequitable development processes • Disaggregate food system dynamics to ensure that women and youth are engaged positively in change • Analyze local climate risks to the system and package insight as novel financial instruments • Model threats to delta food systems from climate change and other selected drivers to provide regional scale insights
Outcomes
National and international partners [policy-makers, investors, donors, civil society] adopt clear actions [plans, investments, strategies] to support growth of delta food systems in ways that: • **Offer** technologies that local communities want and use • **Manage risks** in highly variable local conditions • **Enhance** nutrition sensitive attributes • Promote **gender equality and social inclusion** • Are **climate-positive** • **Maintain ecosystem function**

Deltas are strongly interconnected systems. Consequently, the Initiative takes a systemic approach to support accelerated adaptation locally (WP1) while also protecting against threats to nutrition (WP2), investment (WP3) and the natural resources on which the system depends (WP4). WP5 provides regional foresight to advise of longer-term threats and opportunities.

Research is embedded locally. Most (~80%) of the activities (WPs 1–4) focus on local food system adaptation, WP5 provides a regional perspective and connects local activities to regional demands and opportunities.

With fertile soils and available water, deltas can be capable of very high productivity. At the local scale, **WP1 (Adapting Deltaic Production Systems)** builds networks with partners to establish learning alliances within which communities can explore new agronomy-enabled opportunities for sustainable intensification and engage with new value chains to meet burgeoning demand from within and outside delta regions. The goal is to accelerate growth and realize a substantial if highly variable potential.

Acceleration comes with risks, which are addressed by WP2, WP3 and WP4. **WP2 (Nutrition sensitive Deltaic Agrifood Systems)** works in parallel with WP1 to ensure that these systems do not lose capacity to deliver diverse and nutritious food as they intensify. Food systems need to adapt in ways that enhance, not jeopardize, critical nutritional capabilities of these systems.

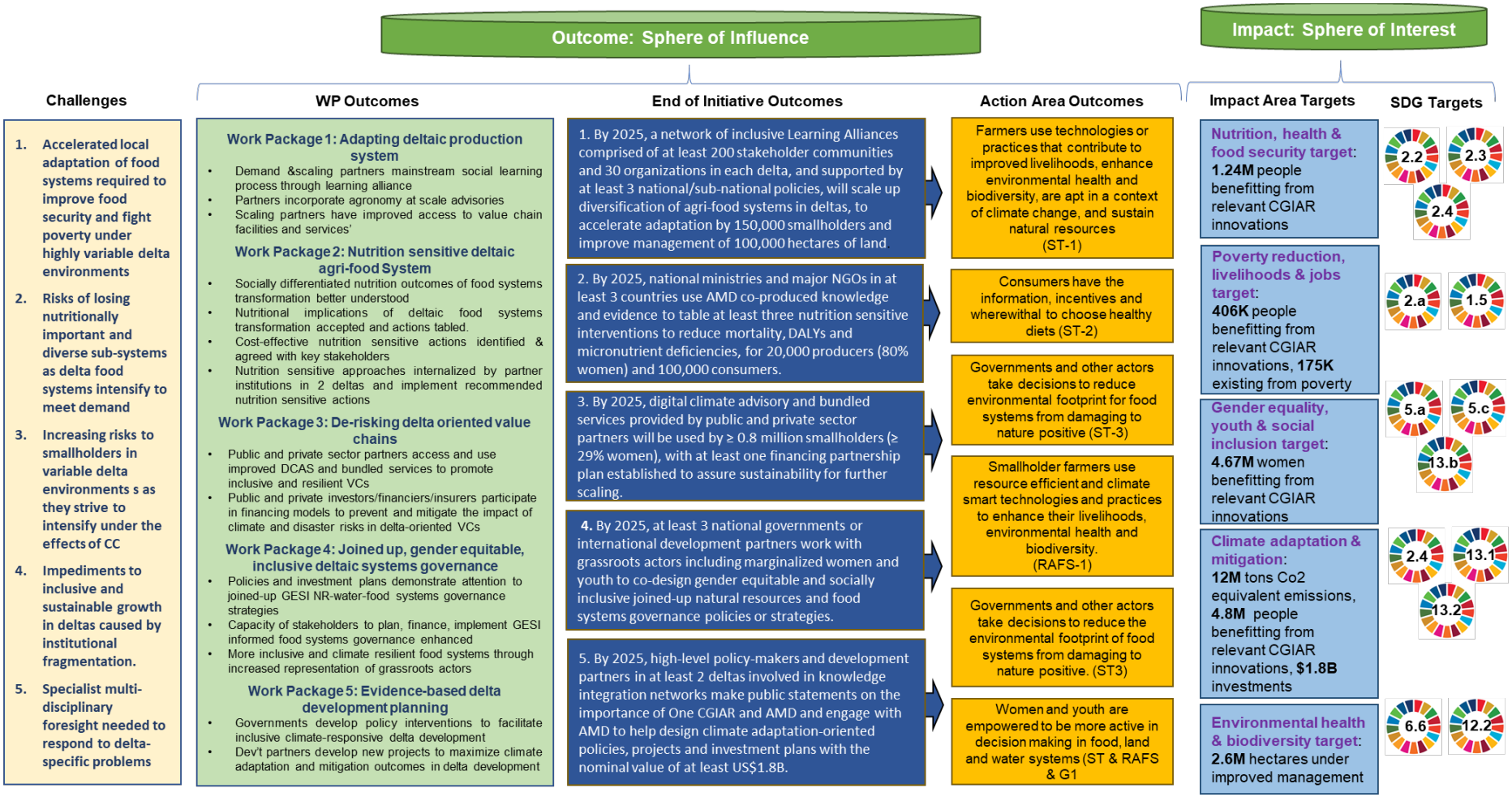
Investment is essential to rapid adaptation and **WP3 (De-risking delta-oriented value chains)** is needed to support millions of smallholders and other value chain actors to invest in the face of large uncertainties relating to climate, markets and local variations in land suitability.

The final element is provided by WP4 **(Joined up, gender equitable, socially inclusive deltaic NR-Food Systems governance)** which ensures that investments and innovations in improving food security do not compromise the local NR base and that inclusion, sustainability and resilience are core drivers of change. This WP works to correct the lack of coordination between water, land, environment and food institutions governing different aspects of highly integrated natural resource, water and food systems, which often lead to exclusionary outcomes, with overall outcomes of depleting the NR base.

WP5 (**Evidence-based delta development planning**) delivers region-wide perspectives and cross-basin insights on climate threats, drivers and opportunities. It does so through a network for information exchange and dialogue on which to develop strategies to cope with rapidly changing conditions.

The EOI outcomes describe different aspects of processes to put the deltas on a fast-track for adaptation while ensuring balanced development towards the goals of food and nutrition security, gender equity and social inclusion, poverty alleviation, climate adaptation and resilience, and sustainability.

3.1.1 Full Initiative TOC diagram



3.2 Work Packages and Work Package TOCs

Work Package 1: Adapting deltaic production systems

Work Package 1: Adapting deltaic production systems	
Work Package main focus and prioritization	Asian Mega-Deltas are under intense pressure to grow while adapting to threats of flooding, drought, salinity, and heat stress associated with climate change. Farmers and other value chain actors are ready to explore new production practices and opportunities for value creation, but what options are best for them locally? This Work Package will synthesize existing research into a fine-scale interactive tool to explore promising local options with farmers. It will be implemented through learning alliances around value chains to design locally adapted agronomy packages and agri-business models to accelerate the adoption of diversified production systems that are better adapted to the effects of climate change.
Geographic scope ***Regional***	Ganges delta: Bangladesh, India Irrawaddy delta: Myanmar Mekong delta: Cambodia and Vietnam

Work Package 1: The science

WP1 will facilitate scaling innovation to support resilient diversified deltaic production systems and reduce environment footprints and climatic risks. This will be done by convening stakeholders in learning alliances, providing technical knowhow on land suitability and agronomy, and enabling value chain development.

Specific objective	Research questions	Methods
Objective 1: Farm and landscape level adaptive suitability assessments for production system diversification and climatic risk reduction.	**1.1.** What are the best-bet production systems for deltaic-climate adaptation and mitigation? **1.2.** How, where and when can low carbon emission pathways support food system transformation? (Linked with WP5)	**1.1.1.** Spatial analysis and mixed methods modelling to assess stakeholders' risk and vulnerability perceptions, at spatial scale. **1.2.1.** Tools and methods including field experiments, RCTs, econometric modelling, and policy analysis for measuring multiple impacts of low carbon emission technologies.
Objective 2: Strengthen social learning and innovation through inclusive learning alliances to identify opportunities to mitigate and adapt to climate risks	**2.1** How can learning alliances best facilitate social learning around agricultural innovations to support climate adaptation and resilience? **2.2** Who are the key actors that need to be involved to scale the diversified production system?	**2.1.1** Establishing and activating inclusive multistakeholder learning alliances[60] **2.1.2 & 2.2.1** Mixed methods assessments of the role of social learning, stakeholders and institutional change in facilitating innovative practices, and their effects.

Objective 3: Develop improved agronomy packages for diversified delta production systems, tailored to local contexts for increased climate resilience.	**3.1** What existing underutilized agronomic innovations and knowledge can be modified and scaled to enhance climate resilience? **3.2** How can existing production systems be adapted to meet demand for nutritious foods, while mitigating climate impacts? (Linked with WP2) **3.3** Do current diversification trajectories support outcomes that are gender equitable and socially inclusive, and how can these be strengthened? (Linked with WP4)	**3.1.1** Stakeholder surveys, participatory assessment, adaptive trials and comparative analysis of innovations **3.2.1** RCTs, econometric analysis, trade-off analysis, cost-benefit analysis, behavioral analysis, inclusive food value chain analysis etc. **3.2.2** Assessing the production systems using sustainability framework[61] **3.3.1** Inclusive agrifood value chain development framework, women empowerment in agrifood value chain, behavioral analysis. **3.3.2** Mixed methods and decision support tools to analyze methods, drivers and constraints for scaling up; and use of ASAT tool[62] for assessing and improving the scaling potential of agricultural technology
Objective 4: Develop input supply chains and markets to support production and consumption of diversified products.	**4.1** What supply chain actor roles and capacities are required to support production systems diversification, and how can these be strengthened? **4.2** Can community-based or collective agri-business models be used to facilitate scaling of diversified production systems?	**4.1.1 and 4.2.1** Participatory market chain approaches and mixed methods

Outputs

1. **High resolution suitability assessment** of agri-production systems in deltas and characterization based on current biophysical and socio-economic profiles to accelerate farmer centric learning and reducing climatic risk.
2. **Learning alliances** established to facilitate gender inclusive social learning around value chain development within complex and highly variable delta food systems.
3. Improved **agronomy packages** formulated with stakeholders and designed for delta systems scaled through stakeholder organizations.
4. **Agri-business models** developed for selected value chains to support diversified production systems trialed with stakeholders.

WP1 outcomes

1. Demand and scaling partners mainstream gender inclusive social learning process through learning alliance
2. Partners incorporate “improved agronomy at scale” advisories into their organizational system
3. Scaling partners have improved access to value chain facilities/services

Work Package 1: The theory of change

Causal process

The end-of-Initiative outcome for the WP1 is to facilitate scaling of existing and emerging technologies and practice solutions for diversified production systems through the establishment of learning alliances and national/sub-national policies to benefit at least 150,000 smallholder farmers.

WP1 identifies, synthesizes, evaluates, adapts, and scales interventions to improve the deltaic production system in order to adapt to and mitigate the effects of salinity, flooding, drought, terminal heats, and sinking land. By 2030, the Initiative is targeting to bring at least 2.6 million hectares under improved management. This Work Package's TOC considers that addressing production system barriers to scaling (where, what, for whom, and how) as well as capacity to use and scale innovations can improve the delta community's income and livelihood while mitigating and adapting to climatic risks.

The main constraints to system improvement in the deltas include the biophysical and social complexity of the landscape, diverse climate change impact at micro-level, low investment capacity of farmers community and deeply entrenched gender and social inequalities. Low technical and extension capacity is another major obstacle to achieving transformative production system changes, which increase the risk of investments in production systems and hamper scaling.

By establishing learning alliances, the WP will bring stakeholders together to identify knowledge gaps, agronomic needs, scaling opportunities and pathways for improved production systems. Interactive tools will communicate local options for agronomy improvement based on biophysical and social profiling of landscape. These will inform farmers, agri-entrepreneurs, extensionists and private companies of the potential production system options in different parts of deltas. The improvement in agronomy of delta production systems will be focused through decision-enabling tools and approaches, e.g., what are the options to manage high salinity at the end of the dry season and where will they apply?' The establishment of agri-business models will support the value chain of diversified production systems in collaboration with WP3. We assumed the capacity building and support to establish learning alliances will trigger changes in the system to incentivize the stakeholders to be part of the social learning process. ***Note:*** *TOC assumptions are included in the diagram.*

Key partners

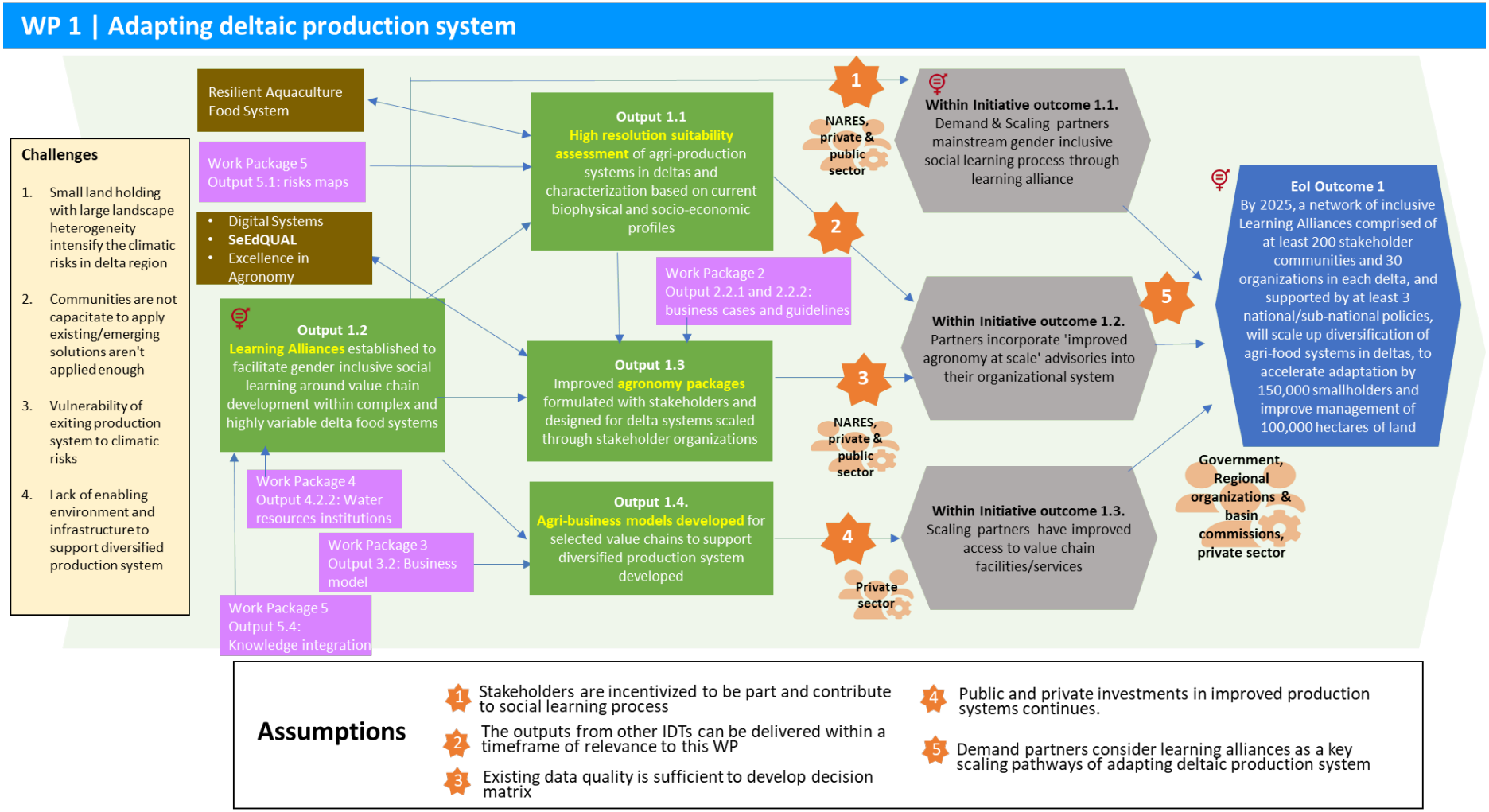
The synthesis of knowledge in the region will rely heavily on collaboration and engagement with demand, scaling and innovation partners to inform system-level barriers and scale potential production options. Further detail can be found in Annex 3.

Synergies with other Work Packages and Initiatives

WP1 and **WP2** will work together to ensure balance between goals of production and nutrition in locally diverse systems. **WP3** supports investment under uncertainty through targeted DCAS. The learning alliances will be supported through **WP4** work on 'joined-up governance'. The strategic insights through **WP5** on climate change impacts will guide the tailoring and implementation of WP1 innovations.

The AMD will work with other thematic IDTs as innovation partners e.g., the suitability assessment with **Resilient Aquaculture Food Systems**. AMD will work with **SeEdQUAL** for climate resilient varieties of various crops. Similarly, the advisories for diversified production systems will be built on key outputs and innovations of CRPs as well as innovations from **Digital Systems** IDTs and **Excellence in Agronomy.**

Work Package 1: TOC diagram



Work Package 2: Nutrition sensitive deltaic agrifood systems

Work Package 2: Nutrition sensitive deltaic agrifood systems	
Work Package main focus and prioritization	Deltaic food systems are transforming extremely rapidly in response to multiple demand and supply side drivers[63], resulting in changing consumption and production practices with positive and negative nutrition outcomes that are highly socially differentiated, but poorly understood[64]. An inadequate knowledge base and limited policy coherence hamper the design of *nutrition sensitive* actions[65] that can mitigate negative nutrition outcomes and leverage opportunities for positive change[66]. This Work Package promotes sustainable production and consumption of nutritious foods in Asian Mega Deltas by involving institutional stakeholders in the co-production of knowledge to support design of *nutrition sensitive* interventions[67] to support well-nourished, healthy people and resilient agro ecosystems
Geographic scope ***Regional***	Ganges delta: Bangladesh, India Mekong delta: Cambodia and Vietnam

Work Package 2: The science

WP2 seeks to ensure that deltaic food systems sustain and enhance nutrition security equitably, in a context of rapid change. The first requirement of designing appropriate nutrition sensitive interventions is to understand the characteristics of these systems and their socially differentiated nutrition implications.

Specific objective	Research questions	Methods
Objective 1: **Assess changes in deltaic food consumption patterns**, in relation to demand side drivers of change, to reveal socially differentiated nutrition outcomes.	**1.1** How are deltaic food consumption patterns changing in a context of rapid socioeconomic and environmental change, and with what implications for human nutrition? **1.2** How are gendered and generational consumption preferences and practices changing due to migration, urbanization, changing time constraints and aspirations[68]?	**1.1.1** Analyze existing datasets to evaluate changes in food consumption and micronutrient adequacy by social group. Conduct new surveys where existing data are inadequate. **1.1.2** Econometric analysis of relationships between changing diets, micronutrient intakes, and demand-side drivers[69]. **1.2.1** Ethnographic studies and structured surveys of how and why food consumption preferences and practices are changing for women and men in different age and socioeconomic groups, with what nutrition implications[66].
Objective 2: **Evaluate how deltaic agroecosystems and food production practices are transforming** in response to multiple drivers[7071], to reveal socially differentiated nutrition outcomes.	**2.1** How are climate change, ecosystem modification, and demand shifts altering deltaic agro-ecologies and cropping patterns[72], with what implications for supply of nutritious foods and nutrition security? **2.2** How is the nutrient yield (quantity of micronutrients produced per unit area of land[73]) of land- and water-based food production systems changing in response drivers, with what implications for equity and gendered access and control?	**2.1.1 & 2.2.1** In depth case studies from purposively selected sites spanning a representative range of deltaic agroecosystems to assess how climatic, environmental, demographic, and market drivers have affected nutrition security for different social groups. **2.3.1** Statistically representative surveys case study villages to assess nutrient yields of different production systems, and access and control by different social groups. **2.3.2** Modelling current farming systems nutrient yields at the deltaic scale and estimating changes under future scenarios.

Objective 3: Identify *nutrition sensitive* policies, and interventions to support equitable and sustainable consumption and production of nutritious foods in deltas in the face of rapid change.[74]	**3.1** Which forms of business case will motivate decision makers to support appropriate nutrition sensitive actions for different deltaic population sub-groups?[75]	**3.1.1** Stakeholder engagement in identification and co-design of menu of appropriate *nutrition sensitive* interventions and policies. **3.1.2** Cost-benefit analyses of proposed *nutrition sensitive* options, including differentiated nutrition outcomes for population sub-groups.

Outputs (for each delta)

1. Typology of effects of food systems transformation on deltaic ***consumption and production*** patterns and practices, differentiated by gender, age, etc.
2. ***Quantified, socially differentiated evidence*** of **nutrition outcomes** of deltaic food systems transformation.
3. Menu of costed ***nutrition sensitive*** **business cases** tailored for AMDs.
4. **Guidelines** for implementing **nutrient *sensitive* actions** in deltaic food systems.

WP 2 outcomes

1. Socially differentiated nutrition implications of deltaic food systems transformation better understood by institutional stakeholders
2. Most cost-effective *nutrition sensitive* actions identified and agreed with key stakeholders
3. *Nutrition sensitive* thinking and approaches internalized by partner institutions in two mega-deltas
4. Stakeholders in two mega-deltas have committed to implement recommended *nutrition sensitive* actions.

Work Package 2: The theory of change

Causal process

Nutrition sensitive approaches make nutritionally rich foods and dietary diversity central to overcoming micronutrient deficiencies and malnutrition[76]. Nutrition sensitive interventions are typically intersectoral and involve coordination among stakeholders such as ministries of agriculture and health to identify nutrition problems among target groups, design ways to increase access to nutritious foods, and design shared indicators for measuring progress. Pathways and entry points include policies, agricultural value chains, producer groups, and innovation hubs[77]. Deltaic food systems are transforming extremely rapidly in response to complex drivers, and nutrition sensitive policies and interventions are in their infancy. This context makes it important to establish a solid evidence base as the foundation for design of effective nutrition sensitive actions. WP2 will generate a comprehensive quantitative-qualitative understanding of transformations in deltaic food systems from the consumption (demand) and production (supply) sides, drivers of these changes, and their implications for human nutrition. This information will be used to design a menu of nutrition sensitive interventions and build business cases for their adoption *ex-ante* through cost-benefit analyses incorporating projected nutrition outcomes and accounting for the political economy of the policy environment in each target geography. Robust quantification of projected impacts of nutrition sensitive policies and interventions will bolster support for adoption by key stakeholders. Decision makers and researchers in target geographies will be engaged in

active collaboration in research, design, and outreach to build support and buy in and grow the capacity of participating individuals and institutions.

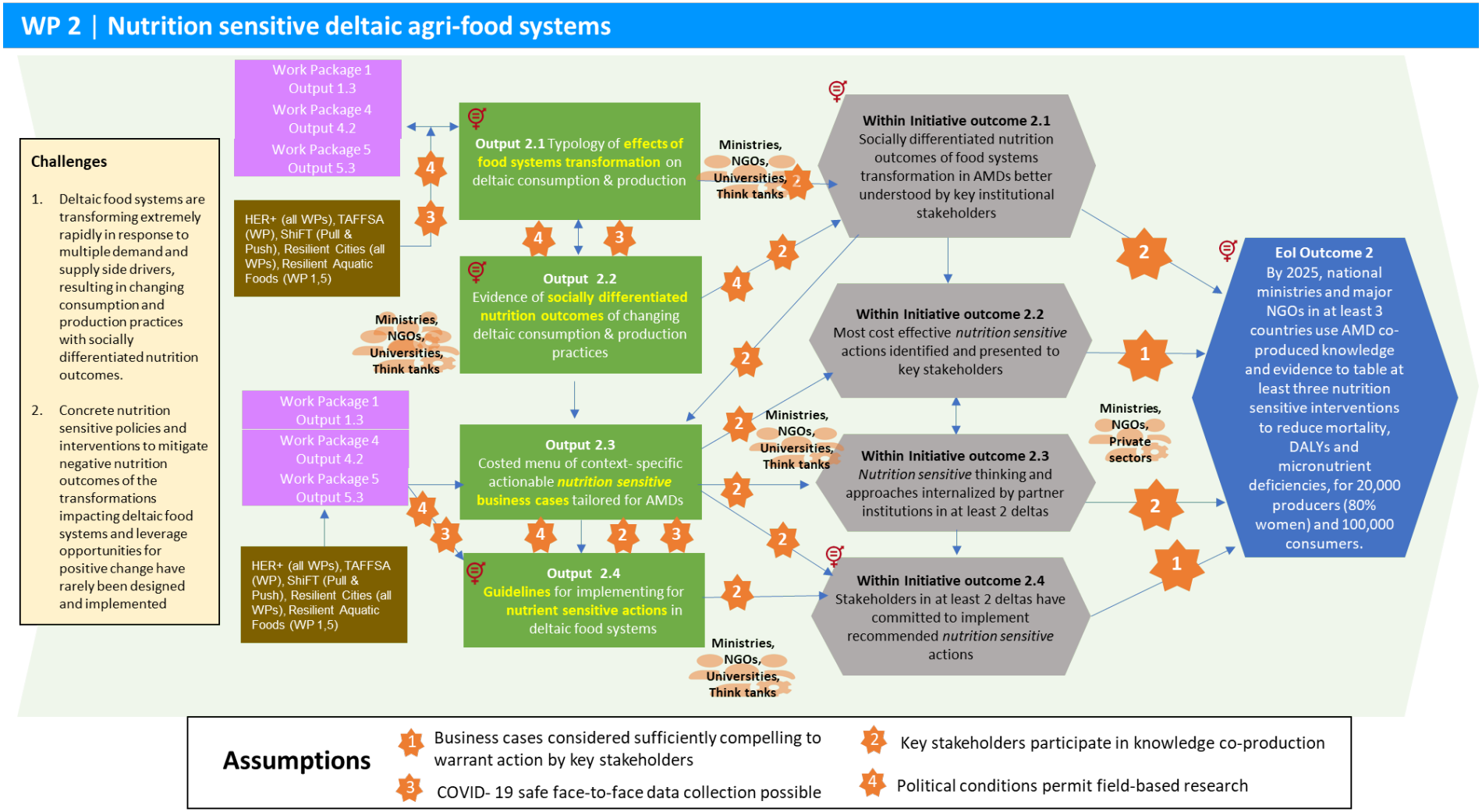
Key partners: Will include: (1) key government ministries or agencies; (2) national and international NGOs; (3) donors and multilaterals; (4) researchers at universities and think tanks; (5) agri-businesses; and (6) members of deltaic communities. Further detail can be found in Annex 3.

***Assumptions*:** (1) The business case for nutrition sensitive actions is sufficiently compelling for stakeholders to take up recommended actions. (2) Key stakeholders participate in knowledge co-production. (3) Political conditions permit continuation of research activities and policy engagement (except Myanmar). (4) The COVID-19 pandemic attenuates sufficiently to allow a return to face-to-face research activities.

Synergies with other Work Packages and Initiatives
Strong synergies between **WP1** and WP2 will ensure that critical aspects of nutrition are valued by actors *as* they pursue rapid adaptation of production systems; **WP3** will help to de-risk aspects of production systems that are of particular high-nutrition value. **WP4** will support inclusive engagement and NR-sensitive governance to ensure that nutrition-valuable facets of production systems are not jeopardized. **WP5** will provide strategic insight of drivers of change across all deltas to support balanced and longer-term change.

WP2 will collaborate with HER+ around gendered nutrition outcomes; RAqFS around nutrition data generation; TAFSSA, which focuses on determinants of sustainable healthy diets and food systems transformation in dryland areas of South Asia; SHiFT regarding food environments and sustainable healthy diets in Vietnam and Bangladesh; Resilient Cities around urban-rural interactions

Work Package 2: TOC diagram



Work Package 3: De-risking delta-oriented value chains (VCs)

Work Package 3: De-risking delta-oriented value chains (VCs)	
Work Package main focus and prioritization	Digital Climate Advisory Services (DCAS) can help small-scale producers and SMEs[78] to prevent losses and recover faster from climate shocks and stresses[79]. Returns on investment for DCAS are high (1-to-24x), especially with complementary services, and can drive GDP growth[80]. Access however remains limited, with services being fragmented, unsustainable, and not reaching last-mile end-users. To de-risk key VCs[81] associated with deltaic systems, and building on WP1 and WP2, we will, with public-private sector partners: 1) assess the potential of DCAS and complementing services to address climate risks among vulnerable groups; 2) support development of improved and inclusive DCAS and bundled services (financing, input supply, market access, insurance); and 3) identify and develop financing models/partnerships[82] to achieve scale.
Geographic scope ***Regional***	Ganges delta: Bangladesh (and India- scoping studies) Irrawaddy delta: Myanmar Mekong delta: Cambodia and Vietnam

Work Package 3: The science

WP3 will reduce climate risks among vulnerable groups (especially women and youth) and facilitate investment in deltaic VCs through DCAS and complementary services.

Specific Objective	Research Questions	Methods
Objective 1: Assess potential of DCAS and complementing services to address climate and disaster risks among end-users in key VCs through climate-smart and resilient practices.	**1.1** What are the main climate risks among vulnerable groups from production to consumption? **1.2** How can these be addressed through DCAS and complementing services?	**1.1.1** Scoping review of deltaic VCs and climate risks, vulnerabilities and end-users, current state of DCAS, and previous research and initiatives relevant to digital services. **1.1.2** Generate livelihood and climate risk maps, and vulnerability profiles across VCs through Delphi studies supported by key informant interviews and focus group discussions. **1.1.3**. Assess existing digital climate advisory and services in key VCs focused on key characteristics, achievements and challenges. **1.1.4** Stakeholder workshops to co-design inclusive de-risking strategies, assess trade-offs, and prioritize options for VCs through DCAS and bundled services.
Objective 2: Support development of inclusive DCAS and bundled services to reduce climate and disaster risks in delta-oriented VCs	**2.1** How can DCAS be bundled with other services (financing, input supply, market access, insurance) to create viable business models? **2.2** How can DCAS and bundled services be tailored to and targeted to last-mile end-users (especially women, youth)?	**2.1.1** Competitive calls for partner proposals to co-develop innovative and inclusive digital tools/platforms for DCAS and bundled services. **2.1.2** Linking of public and private sector partners (based on interest, capacity, activities), and creating business cases for tool and platform development. **2.1.3** Interactive user-centered design to co-develop, test, and improve inclusive DCAS and bundled services with public-private partnerships for key VCs.

		2.1.4 Modelling and validation of tailored digital climate and early warning information products to address identified risks. **2.1.5** Behavioral experiments filling knowledge gaps on end-user willingness to pay for DCAS and bundled services. **2.1.6** Business model development to enhance uptake and scaling of DCAS among vulnerable groups. **2.1.7** Participatory learning and action, including regular monitoring and evaluation through key informant interviews, surveys, and workshops.
Objective 3: Identify and develop innovative financing models/partnerships to support scaling of DCAS and bundled services	**3.1** How can existing climate and disaster risk financing models be adapted to scale inclusive DCAS and bundled services?	**3.1.1** Systematic literature review of climate risk financing, and institutional and policy analysis, to identify opportunities and barriers. **3.1.2** Co-develop inclusive financing models with public and private sector partners tailored to specific climate risks and vulnerable groups. **3.1.3** Engagement with investors, financiers, and insurers to create interest and modify financing models based on willingness to invest.

Outputs

1. **VC climate risk and vulnerability assessments** to identify inclusive intervention strategies and options for DCAS and complementary services.
2. **Business models** for inclusive DCAS and bundled services to reduce risks in specific delta-oriented VCs.
3. **Inclusive and sustainable financing models/partnerships** to support DCAS and bundled services scaling.

WP 3 outcomes

1. Public and private sector partners access and use improved DCAS and bundled services to promote inclusive and resilient VCs.
2. Public and private investors/financiers/insurers participate in financing models to prevent and mitigate the impact of climate and disaster risks in delta-oriented VCs.

Work Package 3: The theory of change

Causal process

WP3 will develop inclusive DCAS and bundled services and facilitate investment (**EoI outcome).** We commence with a climate risk and vulnerability assessment (based on multiple socio-economic and environmental criteria) across delta-oriented VCs, including a review of digital tools/platforms and previous DCAS related research and initiatives to identify crucial knowledge gaps. We will focus on VCs where DCAS can stimulate development through adaptation planning in the context of unique risks (e.g., flooding, droughts, extreme storms) associated with deltas.

We will work closely with public-private sector partners to assess opportunities for DCAS and complementary services (**Output 3.1**). For this, WP3 will build on its experience with VC climate risk and vulnerability assessments[83], and review of digital tools[84], and align with WP1,2 and 5 and relevant Initiatives (UU, ClimBeR, RAqFS, TAFSSA). These profiles will inform two main pathways to de-risk VCs: (1) business model development for DCAS and bundled services (financing, input supply, market access, insurance) based on a competitive innovation fund; this includes strengthening public-private partnerships and a focus on how to reach underrepresented groups (especially women, youth) (**Output 3.2**). We will collaborate with other Initiatives on similar tools/services (UU, ClimBeR) or interest (RAqFS, HER+, TAFSSA), while partnering with national hydromet, universities and research centers; and (2) the development of inclusive and innovative financing models to support inclusive DCAS and bundled services in line with national institutional and policy contexts (**Output 3.3**).

The involvement of public and private sector partners will be critical for scaling DCAS and bundled services. Innovation partners (e.g., IRI, RIMES) will play a cross-country role to provide technical support, build capacity and engagement with demand and scaling partners, building opportunities for south-south learning. To enhance access and use of digital services (**Outcome 1**), results will be shared through workshops and media, while scaling strategies will be developed with partners (and aligned with TAFSSA). We will also engage with investors when developing financing models (**Outcome 2**). This will build strong linkages with key persons among public and private sector partners with social capital to encourage institutional change. ***Note:*** *TOC assumptions are included in the diagram.*

Key partners

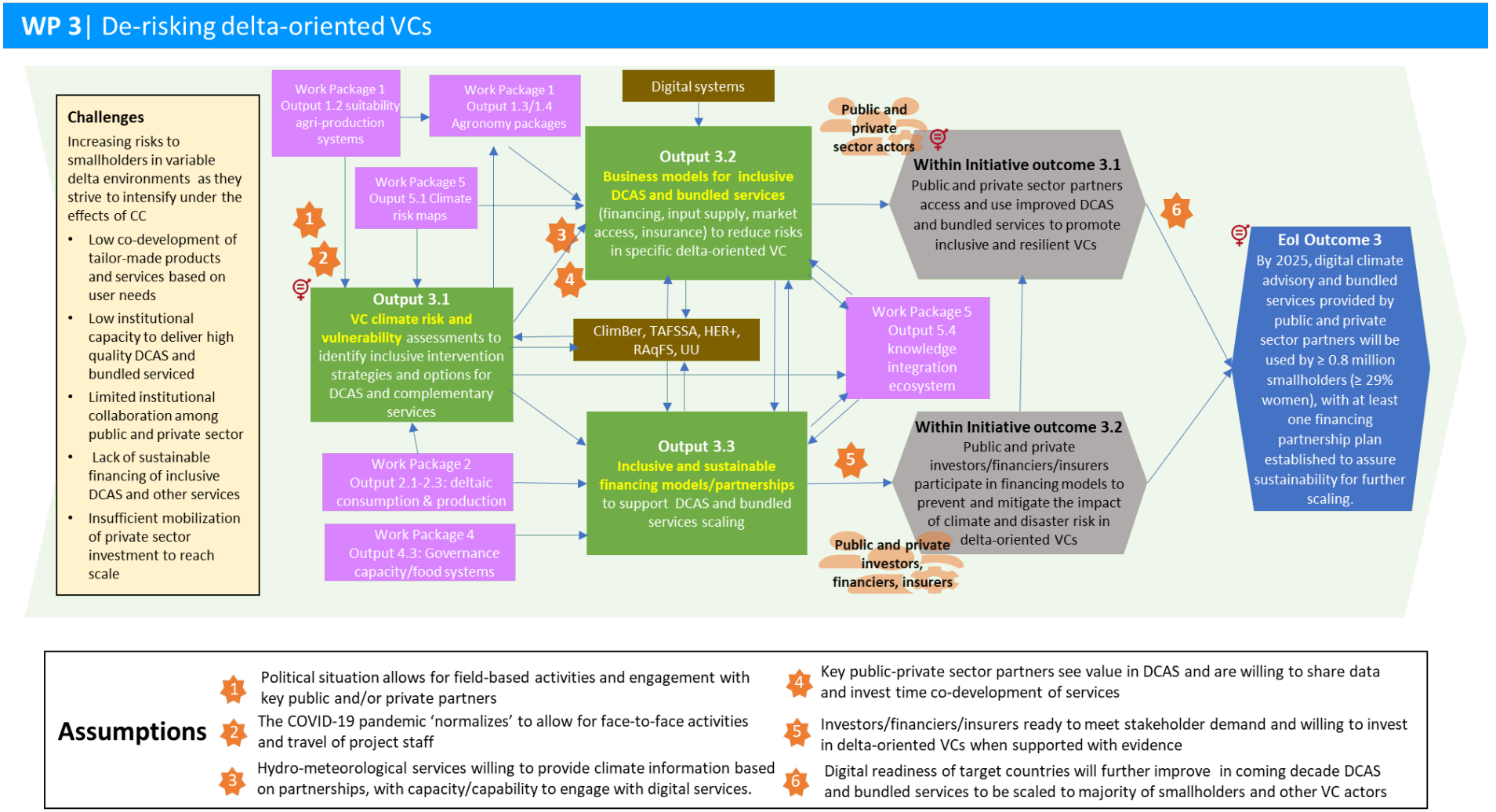
We engage with public sector partners (especially MoA, national hydro-meteorological system, NGOs) and private sector partners (through competitive challenge fund granting) to develop and scale business cases for DCAS and bundled services. Key innovation partners include national and international research institutes, universities, and technology centers. We will engage with national partners, donor initiatives and other investors for innovative financing models/partnerships to support and scale inclusive services. Further detail can be found in Annex 3.

Synergies with other Work Packages and Initiatives

WP3 will build on information from production systems (WP1), nutrition (WP2) and climate risk mapping (WP5) in developing bundled DCAS services; this will then inform agribusiness models (WP1). Information on nutrition (WP2) and local governance/institutions (WP4) will be considered in financial models to scale DCAS among vulnerable groups. WP3 contributes to and makes use of the knowledge integration ecosystem (WP5).

WP3 will also interact with other IDTs such as ClimBer and UU on risk management, climate advisories and bundled services. Similarly, digital tools/platforms will build on innovations from Digital Systems. We align services with aquatic food systems through RAqFS in Cambodia/Myanmar, with TAFSA on overcoming DCAS scaling constraints in the Ganges delta and HER+ on women inclusiveness.

Work Package 3: TOC diagram



Assumptions

1. Political situation allows for field-based activities and engagement with key public and/or private partners
2. The COVID-19 pandemic 'normalizes' to allow for face-to-face activities and travel of project staff
3. Hydro-meteorological services willing to provide climate information based on partnerships, with capacity/capability to engage with digital services.
4. Key public-private sector partners see value in DCAS and are willing to share data and invest time co-development of services
5. Investors/financiers/insurers ready to meet stakeholder demand and willing to invest in delta-oriented VCs when supported with evidence
6. Digital readiness of target countries will further improve in coming decade DCAS and bundled services to be scaled to majority of smallholders and other VC actors

Work Package 4: Joined-up, gender equitable, inclusive deltaic systems governance

Work Package 4: Joined-up, gender equitable, inclusive deltaic systems governance	
Work Package main focus and prioritization	Policy disconnects between various natural resources (NR) and food systems sectors, and lack of capacity within institutions have impeded effective climate resilient food systems governance. Marginalized communities in the AMDs will benefit from more horizontally and vertically integrated "joined-up" governance that underpins resilient food systems and gender equitable and socially inclusive (GESI) approaches and interventions. Working with other WPs, WP4 will use transdisciplinary research evidence, local, experiential knowledge, and political economy insights, to coordinate multi-stakeholder dialogues towards more: (1) Coherent water-agriculture-environment policies and strategies. (2) Collaborative, networked (public, private, and grassroots) implementation practices. (3) Gender equitable and socially inclusive governance innovations.
Geographic Scope ***Regional***	Ganges Delta (Bangladesh) and Mekong Delta (Cambodia, Vietnam), Irrawaddy delta (Provisional)

Work Package 4: The science

WP4 will strengthen capacities of national, provincial and local actors to plan, design and implement NR-informed, inclusive food systems governance, also by improving accountability of public, private and development agriculture and NR-related investments and interventions in the AMDs.

Specific objective	Research questions	Methods
Objective 1: Facilitate policy stakeholders in AMDs to engage collaboratively in identifying actionable strategies for more integrated NR-water-food systems governance to support climate resilient, GESI food system outcomes.	**1.1** Can transdisciplinary evidence and improved networking incentivize better alignment of NR, water, and agricultural policies, regulatory frameworks and implementation strategies? **1.2** Will vertically and horizontally "joined up" governance approaches support more climate resilient and GESI-informed NR, water, and agricultural policy outcomes than traditional siloed approaches?	**1.1.1** Comparative syntheses of joined up and siloed approaches to food systems governance with respect to climate resilience and GESI. **1.1.2** Convene stakeholder dialogues to distil learning from 1.1.1 and relevant WP 1, 2, 3 and 5 outputs, to collaboratively identify actionable strategies for integrated food systems governance.
Objective 2: Facilitate and build capacity of sub-national and local institutions in diverse delta climate hotspots to implement decentralized cross-sectoral governance initiatives designed for climate resilience and GESI.	**2.1** What entry points do decentralization policies, strategies, and formal and informal institutions provide for facilitating joined up NR-water-agriculture governance? **2.2** What forms of intervention and capacity strengthening in specific local contexts, will support more GESI and resilient food systems governance outcomes?	**2.1.1** Review decentralization policies, capacities and formal and customary governance institutions in focal deltas to identify most promising entry points for facilitating climate resilient outcomes. **2.1.3** Develop and pilot GESI-informed governance capacity building modules collaboratively with key actors identified in 2.1.1.

Objective 3: Build capacity and agency of civil society grassroots actors in the three mega deltas to influence design of more inclusive NR-water-agriculture governance innovations.	**3.1** What forms of cross-sectoral, decentralized, institutional models and coordination can enhance the efficacy, agency and inclusiveness of food systems governance coalitions in specific local contexts?	**3.1.1** Capacity strengthening of key provincial and local actors through collaborative partnerships and cross-learning between institutions and key actors, to facilitate delivery of GESI-informed food systems governance. **3.1.2** Design and apply a participatory MEL system to track inclusion and gender equality interventions and outcomes, map institutional performance and accountability, and identify scalable best practices.

Outputs

1. **Comparative case study syntheses** of joined up approaches to water, agriculture, environment governance
2. **Collaboratively identified entry points and actionable strategies** for improving NR-informed food systems governance with potential for scale up
3. **GESI-informed governance capacity building modules** developed and piloted at national, provincial, and local scales
4. **Capacity and agency strengthening strategies** for engaging women and marginalized groups in the design and implementation of joined-up NR-water-food systems governance processes.
5. **Participatory MEL system** to track GESI, climate resilience and institutional performance and accountability of WP4-supported interventions

WP 4 outcomes

1. Policies and investment plans of two key national or international stakeholders demonstrate attention to joined-up GESI NR-water-food systems governance strategies.
2. Capacity of provincial and local public, private and civil society stakeholders to plan, finance, implement GESI-informed food systems governance enhanced in five Initiatives linked to ongoing land, water, environment projects.
3. More inclusive and climate resilient food systems through increased representation and agency of grassroots actors, particularly women in the design and implementation of joined-up land-water-environment governance Initiatives in ongoing projects.

Work Package 4: The theory of change

Causal process

The climate crisis accelerated by an increasing population and rapid urbanization in the Asian Mega-Deltas puts at risk the livelihoods, food, and nutrition security of more than 100 million marginalized, small-scale producers. Past irrigation and flood control interventions have reshaped the region's biodiverse and fertile landscapes, impacting multiple other food systems, including fisheries and aquaculture[85]. Uncoordinated investments and interventions exacerbate sectoral incoherence between agriculture, land, environment, livestock, fish, forests sectors. Assuming delta-specific, national, and local cultural, socioeconomic, and socio-political contexts allow uptake of AMD transdisciplinary science, our focus will be to increase coherence across NR and food systems sectors.

The high levels of poverty, marginality and vulnerability in the AMDs require governance processes that can tackle deep-rooted and intersectional inequalities of marginalized producers and consumers. Where decentralization policies empower secondary and tertiary institutions to sufficiently reform, we will identify more joined-up pathways to restoring sustainability and equity of food systems. WP4 facilitates a shift from prescriptive and generalized governance solutions to enabling policy and implementation actors at national, provincial, and local levels, including private sector, civil society, and formal and informal community-based organizations to collaboratively analyze ecological, economic, and political challenges, and co-design governance arrangements for more inclusive and climate-resilient natural resources-informed food systems. Finally, IDT timeframes and budgets allowing, WP4 will build capacity and agency of grassroots actors, including marginalized women and youth to inform, implement and evaluate food systems governance and accountability of key stakeholders.

This Initiative will support other AMD WPs to achieve more inclusive outputs: WP1 (Outputs 1.2 and 1.3), WP2 (Outputs 2.1.1, 2.1.2 and 2.1.3), and WP3 (Output 3.3) by working closely with other IDTs, particularly NPS, RaqFS, HER+, TAFSSA and NEXUS Gains. WP4 will also enable a more robust assessment of institutional capacities at scale, and the co-design of actionable pathways to change that are intentionally inclusive and gender equitable. A key output will be MEL systems that track planned processes of engagement to demonstrate their comparative relevance to current practices of top-down and fragmented governance interventions. ***Note:*** *TOC assumptions are included in the diagram.*

Key partners

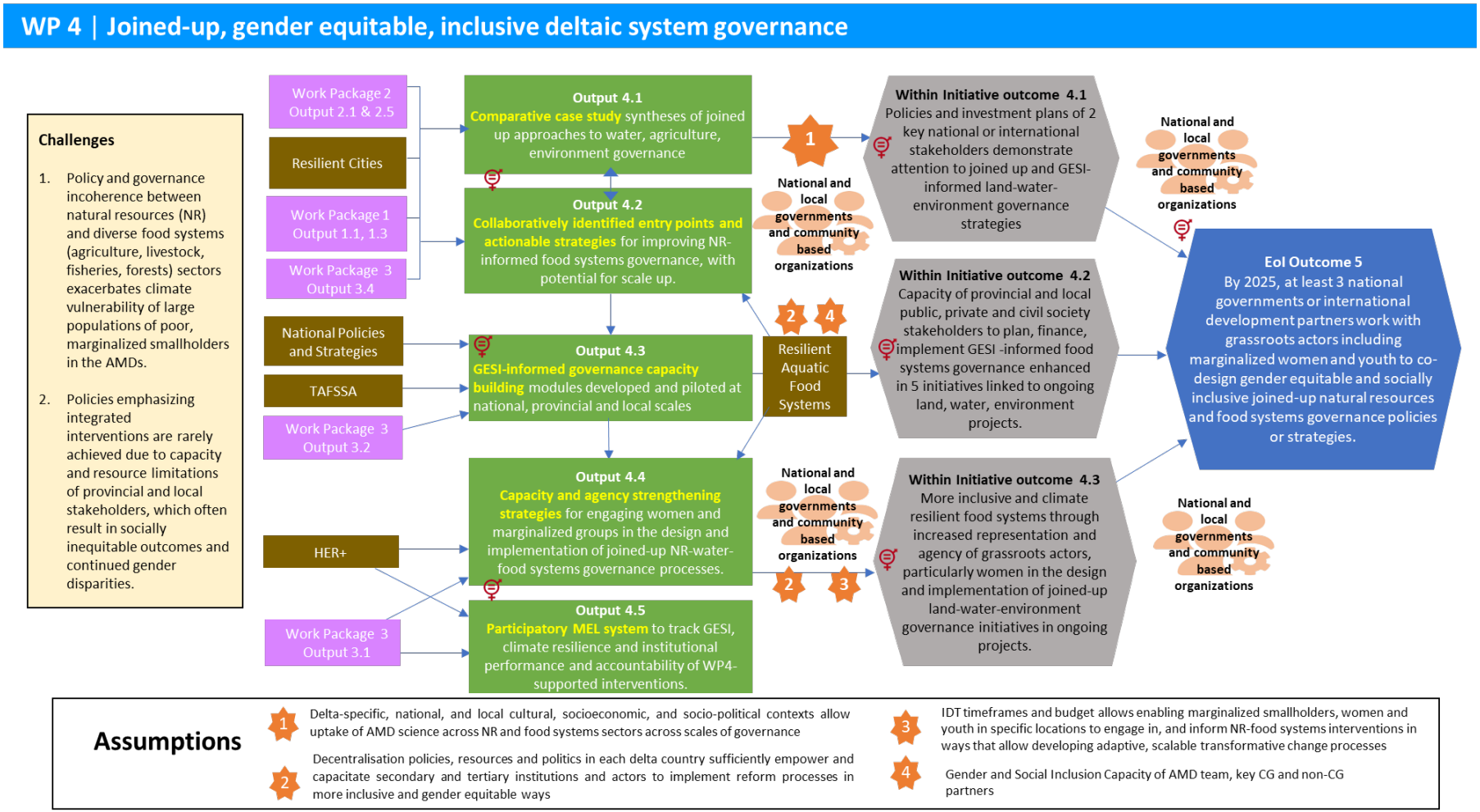
A major entry point for achieving more joined-up governance will be ministries of local government, national and provincial irrigation and water resources institutions, national and regional governance / climate Initiatives. In each country, policy think tanks and institutions shaping sectoral policies and strategies will be key demand partners. We will work closely with the private sector, civil society, grassroots actors who focus on inclusive and sustainable NR- and food systems governance. Further detail can be found in Annex 3.

Synergies with other Work Packages and Initiatives

Synergies with: WP1 in establishing Learning Alliances to facilitate inclusive social learning around improved production system (Output 1.1), and in enabling stakeholder organizations across the delta to design improved agronomy packages (Output 1.2); with WP2 in generating evidence of effects of food systems transformation on deltaic consumption and production (Outputs 1.1 and 1.2); and with WP3 in facilitating policy dialogues and strategies to enhance climate risk management approaches to adaptation (Output 3.4).

WP4 also aligns strategically with the IDTs NPS (Output 1) and with HER+ (all outputs). There are shared objectives with RAqFS on governance of deltaic food systems transformation, with TAFSSA on sustainable food systems transformation in South Asia; and with Resilient Cities around urban-rural interactions.

Work Package 4: TOC diagram



Work Package 5: Evidence-based delta development planning

Work Package 5: Evidence-based delta development planning	
Work Package main focus and prioritization	WP5 will focus on delta development planning at the macro-level to ensure plans/policies incorporate inclusive and climate-proof approaches to food systems transformation. This will be achieved through projecting climate-risks, and defining inclusive approaches that reduce vulnerability and enhance resilience. Adaptive solutions identified throughout all WPs will be integrated and shared through a network of practice to facilitate knowledge exchange, to strengthen delta policy planning and to address capacity needs. National and subnational delta development plans will be assessed to deliver science-based recommendations for interventions that lead to more adaptive food systems, more resilient communities, and more investment in sustainable delta development.
Geographic scope ***Regional***	Ganges delta: Bangladesh, India Irrawaddy delta: Myanmar (limited activities) Mekong delta: Cambodia and Vietnam

Work Package 5: The science

WP5 will improve the development of climate-resilient and inclusive food systems in Asian Mega-Deltas through evidence-supported policy-dialogue and strategic planning.

Specific objective	Research questions	Methods
Objective 1: To support strategic planning and investments with predicted trends of climate change impacts and vulnerability risks on deltaic food systems	**1.1** What are the future trends for climatic risks and social vulnerability risks in Mega-Deltas? **1.2** How can vulnerability risk maps capture dynamic changes over time?	**1.1.1** CS-Map approach[86] **1.2.2** Projection of trends/ risk map foresighting[87] **1.2.3** Identification of hotspots, challenges and opportunities based on IPCC scenarios
Objective 2: To include dual adaptation-mitigation development options in national and sub-national planning for deltas to leverage climate finance	**2.1** How can mitigation in agricultural landscapes be incorporated as an economic development strategy in national climate action plans? **2.2** How can economic, environmental and social benefits of adaptation-mitigation options (WP1) be maximized in deltaic food systems?	**2.1.1** Cross-sectoral policy analyses to integrate agriculture in existing or new jurisdictional approaches (PES, REDD+) **2.1.2** Design carbon offset interventions that attract private climate investments and encourage increased public ambitions to leverage funding for at-risk delta communities (link to WP3) **2.2.1** Cost/ benefit and MACC assessments **2.2.2** Contextualizing MRV systems and enhancing transparency by tracking progress[88] **2.2.3** Financial and technical capacity building for planning and implementing at scale

Objective 3: To synthesize risks, risk-responses and climate action opportunities for inclusive development pathways	**3.1** How do adaptation-mitigation options affect risk response behavior (link WP1&2)? **3.2** What are de-risking strategies for migration? **3.3** How can development pathways be more inclusive and climate-responsive?	**3.1.1** Analysis of migration behavior (from WP2) and relationship to socio-economic impacts of adaptation options **3.2.1** Foresight approach to assess risk profiles of vulnerable groups and define low-risk adaptation strategies **3.3.1** Analyze existing delta development plans with a lens on inclusivity and demographic projections
Objective 4: To integrate knowledge across networks that facilitate exchange, capacity building and cross-country learning to accelerate delta development planning	**4.1** What are the most relevant innovations to increase resilience of deltaic agrifood systems from across the CGIAR and other institutions? **4.2** What capacity is needed for applying knowledge at scale to progress towards development goals that enhance resilience?	**4.1.1** Develop an 'Innovation Matrix' ranking the suitability and scalability of different T&Ps[89] **4.2.1** Develop communities of practice with localized and specialized subsets of networks for cross-fertilization of ideas and rapid iterative design and testing[90] **4.2.2** Capacity gap analysis and "match-making" **4.2.3** Facilitate policy dialogues and workshops with experts, local leaders, private sector and policy makers

Outputs

1. High resolution **climate change risk vulnerability maps** to inform strategic planning
2. **Climate action plans** for leveraging both adaptation and mitigation financing from public and private sector
3. **Inclusive climate-responsive delta development pathways** to guide transformative policies and investments
4. **Knowledge integration network** established to integrate One CGIAR science with partnerships in delta development planning

*WP 5 outcomes**

**generated entirely through this WP or contributed to an outcome generated through outputs of other WP*

1. Governments develop three policy interventions to facilitate inclusive climate-responsive delta development
2. Development partners establish three new projects (or adjust current ones) to maximize climate adaptation and mitigation outcomes in delta development

Work Package 5: The theory of change

Causal process

WP5 will provide proven scientific outputs and expand decision-making support systems across deltas and food systems for policy development following the approach of Cash et al. (2003; "credibility, salience and legitimacy")[91].

Climate mapping has proven its transformational power in Vietnam through close engagement with local stakeholders to build necessary ownership[92]. Such approaches will be improved by forecasting trends and layering socio-economic data and expanded across deltas to accelerate decision-making and impact assuming they will also have strong national buy-in as in Vietnam.

Although considerations for GHG reduction are not prioritized in most developing countries, there are significant financial opportunities for international investment through the NDCs and the new US-EU Methane Reduction Pledge. Rice, especially in AMD countries, represents one of the most promising opportunities for methane mitigation as it has the highest mitigation density potential (tCO_2e/ha) and highest cost-effective mitigation potential (<$100/$tCO_2e$) in Asia (36% mitigation potential vs. 6% in livestock)[93]. As international investments become conditional on climate outcomes, building capacity to attract funding for dual adaptation-mitigation activities and developing climate action plans with transparent MRV systems will be necessary.

WP5 aims to inform and improve existing development plans by delivering new knowledge from WP1 and 2 and co-creating food system adaptation strategies with local partners. Outputs 5.1 and 5.2 add climatic assessment criteria and risk foresighting that will be built on strong integrated data sets allowing other WPs to contribute specialist insight (e.g., demographic changes- WP2,4, inclusive governance models- WP4, nutritional attributes- WP2) for developing inclusive and climate-responsive delta development pathways (Output 5.3). Our logic is to engage NARES partners already during technology development to create ownership. Good communication channels with decision makers and DPs will be created to establish effective scaling partnerships. Thus, new policy interventions and investment programs will be co-developed for improved climate and livelihood resilience.

WP5 will also act as knowledge integrator between thematic One CGIAR Initiatives, local actors, and DPs in Mega-Deltas (Output 5.4). The WP will connect experts in key scalable technologies to the right scaling partners in AMD countries ("match-making") and support partnership building and roadmap development with solution-oriented communities of practice. We anticipate that proactive creation of opportunities for other One CGIAR Initiatives and follow-up events will create new partnerships and result in recognition of AMD focus countries as broadened scope for impact by other Initiative leaders. ***Note:*** *TOC assumptions are included in the diagram.*

Key partners

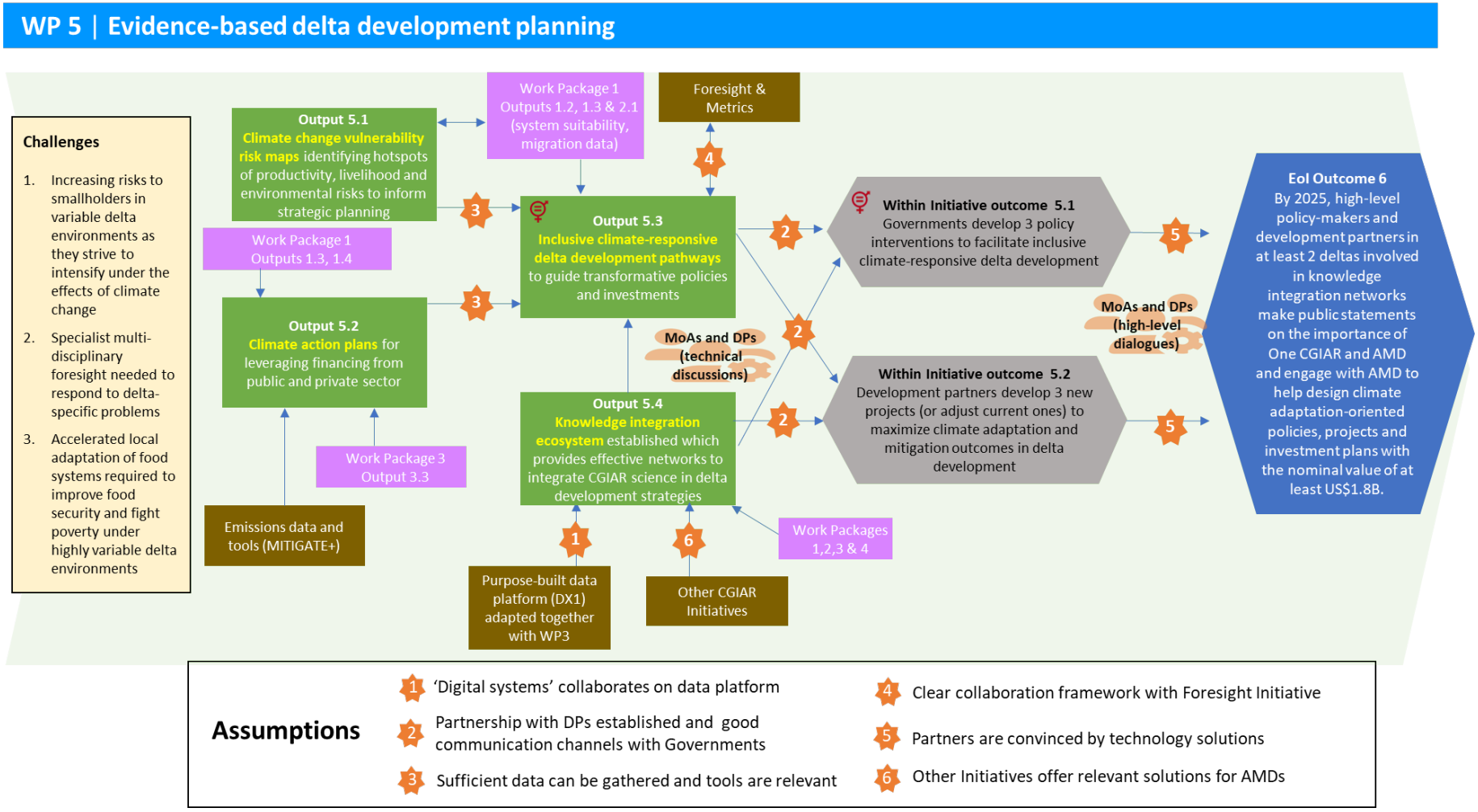
WP5 will closely engage with local stakeholders, national governments, and DPs to climate-proof their Initiatives and programs with outputs co-developed with NARES partners. WP5 will also funnel science outputs of other WPs into relevant strategies and plans and proactively support scaling of other One CGIAR innovations through 'match-making' and exchange events between scientists and local stakeholders. Further detail can be found in Annex 3.

Synergies with other Work Packages and Initiatives

WP5 will synthesize detailed insights from **all WPs** to aid decision making for food system adaptation, including community-based exploration of agronomic technologies (**WP1**); nutrition sensitive needs (**WP2)**; investment de-risking (**WP3**); and inclusive and natural resource-sensitive institutions (**WP4**). In exchange, WP5 provides strategic insight for WPs to perceive and respond to broader scale change in deltas.

WP5 will also interact with ClimBeR for climate risk management; MITIGATE+ for low-emission plans, DX1 on data sharing platforms, NEXUS for integrated resource management and Foresight & Metrics, amongst others.

Work Package 5: TOC diagram



4. Innovation Packages and Scaling Readiness Plan

Scaling will progress the AMD innovations along identified trajectories towards projected benefits identified in section 2.7 in all five Impact Areas. AMD anticipates 18 core innovations developed within AMD WPs plus a further 20+ innovations from 10 other Initiatives with which AMD will collaborate. Innovation Packages will be developed during the inception phase in the first year following Sartas et al. (2020)[94] and will focus on change with partner organizations at three geographical scales (local, delta and regional). They will address different challenges and opportunities as delta systems strive to accelerate adaptation. Coordination and monitoring of innovation trajectories towards AMD Initiative goals will be undertaken by WP5.

While some innovations (e.g., DCAS from WP3) are relatively advanced – largely on account of prior innovations under trial elsewhere – others, (e.g., Nutrition WP2, GESI, INRFS WP4) are further upstream and require capacity and awareness building. Details are listed in Annex 4, which also specifies the 10 other Initiatives with which AMD will collaborate.

AMD should be prioritized for First Wave scaling backstopping and start Light Track from Quarter 3 2022 onwards, Standard Track from Quarter 2 2023 onwards, and Advanced Track for the Initiative in Quarter 1 2024, aiming to cover 26–50% of its Innovations. The AMD Initiative allocated US$390,000 to implement the Innovation Packages and Scaling Readiness plan (2022: US$140,000 (for seven innovations), 2023: US$150,000 (three Innovation Packages), 2024: US$100,000). Dedicated activities, deliverables, indicators and line-items are included in MELIA (Section 6) and Management Plan (Section 7).

5. Impact statements

5.1 Nutrition, health and food security

Challenges and prioritization: Deltaic food systems are transforming rapidly in response to multiple drivers, resulting in changing consumption and production practices, with nutrition outcomes that are variable, highly socially differentiated, and poorly understood. Inadequate knowledge and limited policy coherence hamper design of *nutrition sensitive* actions to mitigate negative nutrition outcomes and leverage positive impacts. The Initiative will enroll institutional stakeholders in co-production of foundational knowledge to support design and uptake of *nutrition sensitive* interventions and policies that promote sustainable and equitable production and consumption of nutritious foods in Asian Mega-Deltas

Research questions: (1) How are deltaic food consumption patterns changing in a context of rapid socioeconomic and environmental change, and with what implications for human nutrition? (WP2) (2) How is the nutrient yield (quantity of micronutrients produced per unit area of land) of land- and water-based food production systems changing in response to drivers, with what implications for equity and gendered access and control? (WP2). (3) Which forms of business case will motivate decision makers to support appropriate nutrition sensitive actions for different deltaic population sub-groups? (WP2, WP1)

WP	Research/Activities	Outputs	Intermediate outcomes	2025 outcomes and metrics
2	Assess changes in deltaic food consumption patterns, in relation to demand side drivers of change, to reveal socially differentiated nutrition outcomes	Typology of effects of food systems transformation on deltaic *consumption and production* patterns and practices, differentiated by gender, age	Socially differentiated nutrition implications of deltaic food systems transformation better understood by institutional stakeholders	By 2025, national ministries and major NGOs in at least three countries use AMD co-produced knowledge and evidence to table at least three nutrition sensitive interventions to reduce mortality, DALYs and micronutrient deficiencies, for 20,000 producers (80% women) and 100,000 consumers
2	Evaluate how deltaic agroecosystems and food production practices are transforming in response to multiple drivers to reveal socially differentiated nutrition outcomes	*Quantified, socially differentiated evidence* of nutrition outcomes of deltaic food systems transformation	Socially differentiated nutrition implications of deltaic food systems transformation better understood by institutional stakeholders	
2	Identify *nutrition sensitive* policies, and interventions to support equitable and sustainable consumption and production of nutritious foods in deltas in the face of rapid change.	(1) Menu of costed *nutrition sensitive* business cases tailored for mega-deltas. (2) Guidelines for implementing nutrient *sensitive* actions in deltaic food systems.	(1) Most cost-effective *nutrition sensitive* actions identified and agreed with key stakeholders. (2) *Nutrition sensitive* thinking and approaches internalized by partner institutions in two mega-deltas. (3) Stakeholders in two mega-deltas have committed to implement recommended *nutrition sensitive* actions.	

Key partners in this Impact Area are found in Annex 5. Note the key demand, innovation and scaling partners in delivering this Impact Area.

Human resources and capacity development: Team members include nutritionists, agricultural economists, anthropologists, gender specialists, food systems experts. Transdisciplinary, integrated mixed methods, and collaborative approaches to co-production of knowledge with a broad set of stakeholders will be prioritized under this Impact Area.

5.2 Poverty reduction, livelihoods and jobs

Challenges and prioritization: Asian Mega-Deltas are home to 177 million people, 36% of them poor. Urbanization, climate change and increasing mobility are transforming the human geography of Asian mega-deltas and their food systems, creating new livelihood opportunities and new vulnerabilities. COVID-19 has caused a massive decline in welfare across the region, suppressing demand, reversing migration and remittance flows, and undermining financial security for millions. Climate change and anthropogenic stressors (e.g., hydropower, habitat conversion), threaten millions working in agriculture and fisheries with reduced incomes due to eroding productivity, lost livelihoods, or permanent displacement. The Initiative will counteract these trends by supporting the dissemination of sustainable agricultural practices and water management to raise farm productivity and incomes and employment in value chains, contributing to improved natural resource governance to protect livelihoods, and by

promoting bundled digital climate information and financial services to facilitate successful adaptation.

Research questions: (1) What supply chain actor roles and capacities are required to support production systems diversification, and how can these be strengthened? (WP1). (2) How can DCAS be bundled with other services (financing, input supply, market access, insurance) to create viable business models? (WP3). (3) What forms of cross-sectoral, decentralized, institutional models and coordination can enhance the efficacy, agency and inclusiveness of food systems governance coalitions in specific local contexts? (WP4).

WP	Research/ Activities	Outputs	Intermediate outcomes	2025 outcomes and metrics
1	Developing input supply chain and agri-business models for market penetration and supporting diversified production systems	Agri-business models developed for selected value chains to support diversified production systems trialed with stakeholders	Scaling partners have improved access to value chain facilities/services	At least 200 stakeholders and 30 organizations in each delta scale up farmer capability to diversify agrifood systems through a network of LAs, supported by at least three national/subnational policies
3	Support the development of inclusive DCAS and bundled services to reduce climate and disaster risks in delta-oriented VCs	Business models for inclusive DCAS and bundled services (financing, input supply, market access, insurance) to reduce risks in specific delta-oriented VC	Public and private sector partners access and use improved DCAS and bundled services to promote inclusive and resilient VCs	By 2025, digital climate advisory and bundled services provided by public and private sector partners will be used by ≥ 0.8 million smallholders (≥ 29% women), with at least one financing partnership plan established to assure sustainability for further scaling.
4	Build capacity and agency of civil society grassroots actors in the three mega deltas to influence design of more inclusive NR-water-agriculture governance innovations.	Capacity and agency strengthening strategies for engaging women and marginalized groups in the design and implementation of joined-up NR-water-food systems governance processes.	Participation and agency of marginalized actors in the design and implementation of decentralized land-water governance initiatives in at least five initiatives linked to ongoing projects increased.	At least three national governments or international development partners work with grassroots actors including marginalized women and youth to co-design gender equitable and socially inclusive joined-up natural resources and food systems governance policies or strategies.

Key partners in this Impact Area are found in Annex 5. Note the key demand, innovation and scaling partners in delivering this Impact Area.

Human resources and capacity development: Team members include agribusiness, digital innovation and rural finance specialists, gender specialists and other social scientists. Work will involve a mix of policy analyses, co-design of digital tools and agribusiness tools, and theoretically informed intersectional analyses of inequalities and marginality.

5.3 Gender equality, youth and social inclusion

Challenges and prioritization: South Asia, is the second-lowest performer on gender equality in the 2021 Global Gender Gap Report 2021[95]. The situation is somewhat better in Southeast Asia, but with wide variances regionally. For example, polders in Bangladesh have reduced livelihood vulnerability of coastal communities[96]. However, the design and governance of water resources and related food systems institutions have been historically masculine[97], and the gender gap that persists is crosscut by intersecting inequalities[98]. Food security is a national priority in the heavily populated Asian Mega-Deltas, and "the historical and contemporary importance of these projects" is evident in the investments in improving water resources and irrigation. These institutions – both formal and informal – are also recognized as spaces where cultural norms of masculinity are reiterated[99]. Conversely, these institutions also offer the highest opportunity for unpacking and tackling deep-rooted gender inequalities.

Informed by the HER+ Initiative's approach to more transformative outcomes, AMD adopts a gender transformative and socially inclusive lens in WP4, and varying degrees from gender-aware to gender responsive approaches in WPs 1, 2 and 3. This will require putting in place a diverse set of gender and social inclusion tools, methodologies, and building capacity of AMD WP teams, key partners as well as target outreach stakeholders across the hierarchy of various NR – agriculture, irrigation, water, land, local government and related sectoral departments – to facilitate reflexive self-analysis on what needs to change, where and how.

Research questions: (1) How can learning alliances best facilitate inclusive social learning around agricultural innovations to support climate adaptation and resilience? (WP1). How is the nutrient yield (quantity of micronutrients produced per unit area of land) of land- and water-based food production systems changing in response to drivers, with what implications for equity and gendered access and control? (WP2) (3) How can DCAS and bundled services be tailored to and targeted to last-mile end-users (especially women) (WP3) (4) What forms of intervention and capacity strengthening in specific local contexts, will support more GESI and resilient food systems governance outcomes? (WP4)

WP	Research/ Activities	Outputs	Intermediate outcomes	2025 Outcomes and metrics
1	Establishing and activating inclusive multistakeholder learning alliances	Learning Alliances established to facilitate gender inclusive social learning around value chain development within complex and highly variable delta food systems	Demand & Scaling partners mainstream gender inclusive social learning process through learning alliances	At least 200 stakeholders and 30 organizations in each delta scale up farmer capability to diversify agrifood systems through a network of inclusive learning alliances, supported by at least three national/sub-national policies
2	Evaluate how deltaic agroecosystems and food production practices are transforming in response to multiple drivers to reveal *socially differentiated nutrition outcomes*	Typology of effects of food systems transformation on deltaic *consumption and production* patterns and practices, differentiated by gender, age	Socially differentiated nutrition implications of deltaic food systems transformation better understood by institutional stakeholders	National ministries and major NGOs in at least three countries use AMD co-produced knowledge and evidence to table at least three nutrition sensitive interventions to reduce mortality, DALYs and micronutrient deficiencies, for 20,000 producers (80% women) and 100,000 consumers

3	Develop business models for DCAS and bundled services tailored to vulnerable end-user groups (especially women)	Business models for inclusive DCAS and bundled services (financing, input supply, market access, insurance) to reduce risks in specific delta-oriented VCs	Public and private sector partners access and use improved DCAS and bundled services to promote inclusive and resilient VCs	By 2025, digital climate advisory and bundled services provided by public and private sector partners will be used by ≥ 0.8 million smallholders (≥ 29% women), with at least one financing partnership plan established to assure sustainability for further scaling
4	Facilitate and build capacity of sub-national and local institutions in diverse delta climate hotspots to implement decentralized cross-sectoral governance initiatives designed for climate resilience and GESI	GESI-informed governance capacity building modules developed and piloted at national, provincial and local scales	Improved capacity of provincial and local public, private and civil society actors to plan, finance and implement GESI-informed food systems governance in ongoing land, water, environment projects	At least three national governments or international development partners work with grassroots actors including marginalized women and youth to co-design gender equitable and socially inclusive joined-up natural resources and food systems governance policies or strategies

Key partners in this Impact Area are found in Annex 5. Note the key demand, innovation and scaling partners in delivering this Impact Area.

Human resources and capacity development: Team members include gender specialists and other social scientists, nutritionists, digital innovation specialists and agronomists.

5.4 Climate mitigation and adaptation

Challenges and prioritization: Climate change is already affecting Asian deltas[100] Bangladesh, Myanmar and Vietnam are amongst the top 10 countries affected[101]. Flooding, exacerbated by land subsidence[102], salinity, drought, and heat all affect food production. Over half of the coastal area in Bangladesh is now affected by salinity[103], jeopardizing 7% of national rice production. Rice production in the Mekong delta- source of 15% of rice traded globally- is threatened[104]. Rapid adaptation is essential, yet adaptation must also recognize the intense local variation that occurs in deltas. Accordingly, AMD will establish local processes of climate smart adaptation, to explore “best bet” options with communities and seek ways to support investment in the face of uncertainty. The deltas are also hotspots of agricultural emissions[105] and thus have high potential for mitigation. Through support in planning for low-emissions production and establishment of transparent MRV systems, national governments can be supported to achieve their NDC goals while those green investments can be coupled with adaptation measures to transform the deltaic production system toward higher resilience.

Research questions: How, where and when can low carbon emission pathways support food system transformation? (WP1). How can economic, environmental and social benefits of adaptation-mitigation options be maximized in deltaic food systems (WP5)? What are the main climate risks among vulnerable groups from production to consumption and how can these be addressed through DCAS and complementing services? (WP3). What forms of intervention and capacity strengthening in specific local contexts, will support more GESI and resilient food systems governance outcomes (WP4)?

WP	Research/ Activities	Outputs	Intermediate outcomes	2025 outcomes and metrics
1	Farm and landscape level adaptive suitability assessments for production system diversification and climatic risk reduction	High resolution suitability assessment of agri-production systems in deltas and characterization based on current biophysical and socio-economic profiles to accelerate farmer centric learning and reduce climatic risk	Partners incorporate "improved agronomy at scale" advisories into their organizational system	At least 200 stakeholders and 30 organizations in each delta scale up farmer capability to diversify agrifood systems through a network of inclusive learning alliances, supported by at least three national/sub-national policies
5	Include dual adaptation-mitigation development options in national and sub-national planning for deltas to leverage climate finance	Inclusive climate-responsive delta development pathways to guide transformative policies and investments	Governments develop three policy interventions to facilitate inclusive climate-responsive delta development	Policymakers and development partners in at least two deltas involved in knowledge integration networks engage with AMD to help design climate adaptation-oriented policies, projects and investment plans with the nominal value of at least US$1.8 billion
3	Assess potential of DCAS and complementing services to address climate and disaster risks among end-users in key VCs through climate-smart and resilient practices	VC climate risk and vulnerability assessments to identify inclusive intervention strategies and options for DCAS and complementary services	Public and private sector partners access and use improved DCAS and bundled services to promote inclusive and resilient VCs	By 2025, digital climate advisory and bundled services provided by public and private sector partners will be used by ≥ 0.8 million smallholders (≥ 29% women), with at least one financing partnership plan established to assure sustainability for further scaling
4	Facilitate and build capacity of sub-national and local institutions in diverse delta climate hotspots to implement decentralized cross-sectoral governance initiatives designed for climate resilience and GESI	GESI-informed governance capacity building modules developed and piloted at national, provincial, and local scales	Improved capacity of provincial and local public, private and civil society actors to plan, finance and implement GESI-informed food systems governance in ongoing land, water, environment projects	At least three national governments or international development partners work with grassroots actors including marginalized women and youth to co-design gender equitable and socially inclusive joined-up natural resources and food systems governance policies or strategies

Key partners in this Impact Area are found in Annex 5. Note the key demand, innovation and scaling partners in delivering this Impact Area.

Human resources and capacity development of Initiative team: AMD team includes spatial analysts and GIS specialists, agronomists, soil scientists, environmental scientists, social scientists and hydrologist and hydrologic modelers

5.5 Environmental health and biodiversity

Challenges and prioritization: Challenges include: **Threats from intensification**, which already impacts soil health and biodiversity in deltas in SE Asia which started with exceptionally fertile soils, abundant water and high biodiversity; **Climate change,** which drives intensification harder in order to adapt to Climate Change; **Fragmentation of institutions within and around deltas**. Unchecked, this leads to "locking in" of deltas resulting in severely inequitable development and uncoupled development pathways for agriculture, ecological and urban systems. **Loss of biodiversity of food systems in deltas,** which narrows the spectrum of ecosystem services valued locally and loss of livelihood, especially for disadvantaged groups. In response, AMD prioritizes a systemic approach to integrate intensification of food systems locally (WP1), recognizes the value of food system diversity (WP2), while also ensuring inclusive development through joined-up governance (WP4). WP5 provides strategic insight of drivers, threats and opportunities to deltas to support a systemic approach.

Research questions: What are the best-bet production systems for deltaic-climate adaptation and mitigation (WP1)? How are climate change, ecosystem modification, and demand shifts altering deltaic agro-ecologies and cropping patterns, with what implications for supply of nutritious foods and nutrition security (WP2)? Will vertically and horizontally "joined up" governance approaches support more climate resilient and GESI-informed NR, water, and agricultural policy outcomes than traditional siloed approaches (WP4)? What are the future trends for climatic risks and social vulnerability risks in Mega-Deltas (WP5)?

WP	Research/ Activities	Outputs	Intermediate outcomes	2025 outcomes and metrics
1	Establish adaptive suitability assessment with local users at farm level, based on biophysical and socio-economic profiles for diversified agrifood system	High resolution suitability assessment of agri-production systems in deltas & characterization based on current biophysical and socioeconomic profiles to accelerate farmer centric learning and reduce climatic risk	Partners incorporate "improved agronomy at scale" advisories into their organizational system	At least 200 stakeholder and 30 organizations in each delta scale up farmer capability to diversify agrifood systems through a network of LAs, supported by at least three national/sub-national policies
2	Assess changes in deltaic food consumption patterns, in relation to demand side drivers of change, to reveal socially differentiated nutrition outcomes	Typology of effects of food systems transformation on deltaic *consumption and production* patterns and practices, differentiated by gender, age	Socially differentiated nutrition implications of deltaic food systems transformation better understood by institutional stakeholders	National ministries and major NGOs in at least three countries use AMD co-produced knowledge and evidence to table at least three nutrition sensitive interventions to reduce mortality, DALYs and micronutrient deficiencies, for 20,000 producers (80% women) and 100,000 consumers

4	Facilitate policy stakeholders in mega-deltas to engage collaboratively in identifying actionable strategies for more integrated NR-water-food systems governance to support climate resilient, GESI food system outcomes	Collaboratively identified entry points and actionable strategies for improving NR-informed food systems governance with potential for scale up	Policies and investment plans of two key national or international stakeholders demonstrate attention to joined up and GESI-informed land-water-environment governance strategies FS-NR governance	At least three national governments or international development partners work with grassroots actors including marginalized women and youth to co-design gender equitable and socially inclusive joined-up natural resources and food systems governance policies or strategies
5	Support strategic planning and investments with predicted trends of climate change impacts and vulnerability risks on deltaic food systems	Climate change vulnerability risk maps identifying hotspots of productivity, livelihood and environmental risks to inform strategic planning	Governments develop three policy interventions to facilitate inclusive climate-responsive delta development	Policymakers and development partners in at least two deltas involved in knowledge integration networks make public statements on the importance of One CGIAR and AMD and engage with AMD to help design climate adaptation-oriented policies, projects and investment plans with the nominal value of at least US$1.8 billion

Key partners in this Impact Area are found in Annex 5. Note the key demand, innovation and scaling partners in delivering this Impact Area.

Human resources and capacity development of Initiative team: AMD team includes spatial analysts and GIS specialists, agronomists, soil scientists, nutrition scientists, social scientists and hydrologist and hydrologic modelers.

6. Monitoring, evaluation, learning and impact assessment (MELIA)

6.1 Result framework

CGIAR Impact Areas				
Nutrition, health and food security	**Poverty reduction, livelihoods and jobs**	**Gender equality, youth and social inclusion**	**Climate adaptation and mitigation**	**Environmental health and biodiversity**
Common impact indicators AMD Initiative will contribute to and will be able to provide data towards				
# of people benefitting from relevant CGIAR innovations	# of people benefitting from relevant CGIAR Innovations	# of women benefiting from relevant CGIAR innovations	# tons CO_2 equivalent emissions # of people benefitting from relevant CGIAR innovations	# of hectares under improved management
SDG targets				
2.2, 2.3, 2.4	2.1, 1.5	5.1, 5.c, 13.b	2.4, 13.1, 13.2	6.6, 12.2

Action Area: Resilient Agrifood Systems	
Action Area outcomes	**Action Area outcome indicators**
ST 1 – Farmers use technologies or practices that contribute to improved livelihoods, enhance environmental health and biodiversity, are apt in a context of climate change, and sustain natural resources.	STi 1.1 – Number of farmers using climate smart practices disaggregated by gender
	STi 1.3 – Measurable implications of adoptions such as production, profitability, input use, product quality and associated price, environmental and health damage avoided, livelihood, employment and so forth.
ST 2 – Consumers have the information, incentives and wherewithal to choose healthy diets.	STi 2.1 – Diet quality score
ST 3 – Governments and other actors take decisions to reduce the environmental footprint of food systems from damaging to nature positive	STi 3.1 – Area of land under improved mitigation plans (or area that is decreasing in net carbon emissions – more ambitious and longer term)
	STi 3.2 – Area under improved water use plans (or water use efficiency measures – more ambitious and longer term)
RAFS 1 – Smallholder farmers use resource-efficient and climate-smart technologies and practices to enhance their livelihoods, environmental health and biodiversity.	RAFSi 1.1 – Number of resource-efficient and climate-smart technologies at stage IV (uptake by next user), disaggregated by type
ST & RAFS 2 – National and local governments utilize enhanced capacity (skills, systems and culture) to assess and apply research evidence and data in policy making process.	STRAFSi 2.1 – Number of policies/ strategies/ laws/ regulations/ budgets/ investments/ curricula (and similar) at different scales that were modified in design or implementation, with evidence that the change was informed by CGIAR research
ST & RAFS & GI 1 – Women and youth are empowered to be more active in decision making in food, land and water systems	STi 1.1 – Number of farmers using climate smart practices disaggregated by gender
	STRAFSGIi 1.1 – Positive trends in the Women's Empowerment in Agriculture Index (WEIA) at various scales

Initiative and Work Package outcomes, outputs and indicators											
Result type (outcome or output)	**Result**	**Indicator**	**Unit of measurement**	**Geographic scope**	**Data source**	**Data collection method**	**Frequency of data collection**	**Baseline value (outcome only)**	**Baseline year (outcome only)**	**Target value**	**Target year**
Work Package 1: Adapting deltaic production systems											
WP1 EoI Outcome	By 2025, a network of inclusive Learning Alliances comprised of at least 200 stakeholder communities and 30 organizations in each delta, and supported by at least 3 national/sub-national policies, will scale up diversification of agrifood systems in deltas, to accelerate adaptation by 150,000 smallholders and improve management of 100,000 hectares of land	Area under improved agronomy (disaggregated by practices, crops, framing system and geography)	Areas (Has)	5 countries Sub-national	Primary and secondary	Primary - survey; Secondary - national reports	Bi-annual	N/A		100,000	2025
		Number of farmers adopting agronomic solutions, disaggregated by gender	Generic number	5 countries Sub-national/ Local	Primary and secondary			N/A		150,000	2025
		Policies (number of policies developed by government)	Generic Number	Sub-national/ Local	Primary			N/A		3	2025
WP1 Outcome 1	Demand and scaling partners mainstream social learning process through learning alliance	Number of activities that incorporate social learning process through LA	Generic number	National and sub-national	Primary data source	Key informant interviews	Once at the end of the Initiative	N/A		5 per delta	2024
WP1 Outcome 2	Partners incorporate “improved agronomy at scale” advisories into their organizational system	Policies (number of advisories/strategies/policies modified in design or implementation)	Generic number	National and sub-national	Primary data source	Key informant interviews	Once at the end of the Initiative	N/A		5	2024
WP1 Outcome 3	Scaling partners have improved access to value chain facilities/ services	Capacity development (change in the utilization of value chain facilities /services)	Percentage	National and sub-national	Primary data source	Key informant interviews	Once at the end of the Initiative	N/A		5	2024
WP1 Output 1	High resolution suitability assessment of agri-production systems in deltas and characterization based on current biophysical and socio-economic profiles	Data Assets (maps of production areas prone to abiotic stresses, i.e., flooding, salinity, drought, terminal heat in target countries)	Generic Number	National and sub-national	Satellite images, weather data	Remote sensing, GIS, Modelling	Annual updates	N/A	N/A	4 per country	2025
		Data Assets (Maps of socio-economic profiles, e.g., population, poverty rate, income)			Secondary data from statistics,	Compilation from statistics,	Annual, if available			3 per country	

					available spatial data	publications, or available spatial data					
		Data Assets (maps and reports of high-resolution suitability assessment of target agri-production systems)			High resolution satellite imagery	Remote sensing, GIS, modelling	Once			2 per country (depending on prod systems)	
		Capacity building of institutions (Number of people trained disaggregated by gender)			Primary	Surveys	Bi-annual			200	
WP1 Output 2	Learning alliances established to facilitate inclusive social learning around value chain development within complex and highly variable delta food systems	Number of learning alliances established	Generic number	National and sub-national	Primary: MELIA System Documentation of LA meetings	Primary - surveys	Bi-annual200		N/A	8	2025
		Number of stakeholders								200	
		Number of organization/ stakeholder groups joining LAs								30	
		Change in knowledge and practice in at least two stakeholder groups, following learning topics of the LA;	% and Knowledge score							30	
WP1 Output 3	Improved agronomy packages formulated with stakeholders and designed for delta systems scaled through stakeholder organizations	Data assets (*knowledge products*)	Generic number	National and sub-national	Primary	Surveys, inventory of datasets/ publication	Bi-annual	N/A	N/A	10 per delta	2025
		Uptake of knowledge products (data assets)	Percentage	National and sub-national		FGD, KII	Annual			50%	
		Number of tested agri-production systems (disaggregated by crops, aquaculture, geography, farming system)	Generic number	Sub-national/ Local	Primary and secondary	Survey	Annual			3	
		Number of training courses developed on diversified systems	Generic number	Sub-national		Primary - survey; Secondary - reports	Bi-annual			10	

WP1 Output 4	Agri-business models developed for selected value chains to support diversified farming system developed trialed with stakeholders	Number of groups or cooperatives engaged in AVC (men, Women)	Generic number	Sub-national	Primary and secondary	Primary – surveys; secondary - through local government and extension systems	Annual	N/A	N/A	30	2025
		Increase in gross margin	%, amount (USD/ha)	Local	Primary and Secondary	Primary – surveys; secondary - through local government and extension systems	Annual	N/A	N/A	10% increase	2025
		increase in diversity of income	Income diversification on index %								
		Capacity building (Number of people trained on new BM disaggregated by gender)	Generic number	Sub-national	Primary and Secondary	Primary – surveys; secondary - through local government and extension systems	Annual	N/A	N/A	300	2025
Work Package 2: Adapting deltaic production systems											
WP2 EoI Outcome	By 2025, national ministries and major NGOs in at least 3 countries use AMD co-produced knowledge and evidence to table at least three nutrition sensitive interventions to reduce mortality, DALYs and micronutrient deficiencies, for 20,000 producers (80% women) and 100,000 consumers.	**Capacity building**									
		Number of scaling partners deploying co-produced knowledge	Generic number	National and sub-national	Primary: MELIA system	Primary - surveys	Once at the end of Initiative	N/A	N/A	3 scaling partners	2025
		Innovations									
		Number of nutrition sensitive interventions informed by deployed co-produced knowledge	Generic number	National and sub-national	Primary: MELIA system	Primary – surveys	Once at the end of Initiative	N/A	N/A	3 nutrition sensitive interventions	2025
		Number of consumers and producers reached by deployed co-produced knowledge disaggregated by gender								20,000 producers; 100,000 consumers	

		Policies									
		Number of policies, strategies, and curricula developed/ modified to incorporate nutrition sensitive language or commitments	Generic number	National and sub-national	Primary: MELIA System	Institutional documentation	Once at the end of Initiative	N/A	N/A	3 institutional documents	2025
WP2 Outcome 1	Socially differentiated nutrition implications of deltaic food systems transformation better understood by institutional stakeholders	Capacity development (Number of events where key institutional stakeholders participated in co-design of data collection activities or events where most cost-effective nutrition action identified were presented, disaggregated by gender, age of participants)	Generic number	National and sub-national	Primary: MELIA System	Primary - MELIA System, attendance sheets and event recordings; Secondary - Publications	Annually	N/A	N/A	12 events	2024
WP2 Outcome 2	Most cost-effective *nutrition sensitive* actions identified and agreed with key stakeholders	Data Assets (number of reports, briefs, other knowledge products identifying most cost-effective nutrition sensitive actions)	Generic number	National and sub-national	Primary: MELIA System	Desk Review	Once at the end of the Initiative	N/A	N/A	At least 6 publications, 3 datasets	2024
WP2 Outcome 3 & 4	Nutrition sensitive thinking and approaches internalized by partner institutions in 2 deltas Stakeholders in 2 deltas have committed to implement recommended nutrition sensitive actions	Partners internalizing NS approaches	Generic number	National and sub-national	Primary: MELIA System	Institutional documentation	Once at the end of the Initiative	N/A	N/A	At 2 partners publish commitments to implement NS approaches	2024
WP2 Output 1	Typology of effects of food systems transformation on deltaic *consumption and production* patterns and practices, differentiated by gender, age, etc.	Data Assets (number of publications, reports, data, and databases)	Generic number	National and sub-national	Primary: MELIA System	Publications; datasets	Annually	N/A	N/A	At least 6 publications & 3 datasets	2024

WP2 Output 2	*Quantified, socially differentiated evidence* of nutrition outcomes of deltaic food systems transformation.	Data Assets (number of publications, reports, data, and databases)	Generic number	National and sub-national	Primary: MELIA System	Publications ; datasets	Annually	N/A	N/A	At least 6 publications & 3 datasets	2024
WP2 Output 3	Menu of costed *nutrition sensitive* business cases tailored for mega-deltas	Innovations (number of Business cases)	Generic number	National and sub-national	Primary: MELIA System	Publications ;	Annually	N/A	N/A	At least 4 costed business cases	2024
WP2 Output 4	Guidelines for implementing nutrient *sensitive* actions in deltaic food systems.	Data Assets *(number of guidelines)*	Generic number	National and sub-national	Primary: MELIA System	Publications ;	Annually	N/A	N/A	At least 4 sets of guidelines	2024
Work Package 3: De-risking delta-oriented value chains											
WP3 EoI Outcome	By 2025, digital climate advisory and bundled services provided by public and private sector partners will be used by ≥ 0.8 million smallholders (≥29% women), with at least one financing partnership plan established to assure sustainability and further scaling.	Number of smallholders who have used DCAS and bundled services disaggregated by gender Number of financing partnership plans	Generic Number	National and sub-national	Primary: MELIA system	Survey, KIIs, supporting documents	Once at the end of the Initiative	N/A	N/A	≥ 0.8 million smallholders (≥29% women) ≥ 1 financing partnership plan	2025
WP3 Outcome 1	Public and private sector partners access and use improved DCAS and bundled services to promote inclusive and resilient value chains (VCs)	Number of next users providing the innovation, disaggregated by type	Generic number, disaggregated	National and sub-national	Primary: MELIA system	KIIs, supportive documents	Once at the end of the Initiative	N/A	N/A	≥ 2 (public or private) partners per country (except India)	2024
WP3 Outcome 2	Public and private investors/financiers/insurers participate in inclusive financing models to prevent and mitigate the impact of climate and disaster risks in delta-oriented VCs.	Number of inclusive financing models modified in design or implementation, disaggregated by type	Generic number, disaggregated	International, national	Primary: MELIA system	Support letter, meetings held	Once at the end of Initiative	N/A	N/A	≥t 1 major investment modified to enhance DCAS and	2024

										bundled services	
WP3 Output 1	VC climate risk and vulnerability assessments to identify inclusive intervention strategies and options for DCAS and complementary services	Number of reports published	Generic number	National and sub-national	Primary: MELIA system	Self-reporting	Beyond year 1	N/A	N/A	≥ 1 report per country (total 5)	2022/ 2023
WP3 Output 2	Business models for inclusive DCAS and bundled services (financing, input supply, market access, insurance) to reduce risks in specific delta-oriented VCs	Number of business model innovations, disaggregated by type	Generic number	National and sub-national	Primary: MELIA system	Self-reporting; KII	By end of year 2 and 3	N/A	N/A	Model types developed by end of 2023, of which ≥ 1 has demonstrated profitability by end of 2024	2023, 2024
WP3 Output 3	Inclusive and sustainable financing models/partnerships to support DCAS and bundled services scaling	Number of financing innovations, disaggregated by type	Generic number	National and sub-national	Primary: MELIA system	Self-reporting; KIIs	By end of year 3	N/A	N/A	≥ 2 innovative financing models/ partnerships developed	2024
Work Package 4: Joined-up, gender equitable, inclusive deltaic systems governance											
Result type (outcome or output)	**Result**	**Indicator**	**Unit of measurement**	**Geographic scope**	**Data source**	**Data collection method**	**Frequency of data collection**	**Baseline value (outcome only)**	**Baseline year (outcome only)**	**Target value**	**Target year**
WP4 EoI Outcome	By 2025, at least 3 national governments or international development partners work with grassroots actors including marginalized women and youth to co-design gender equitable and socially inclusive joined-up natural resources and food systems	Number of workshops, and participants disaggregated by gender	Generic number	National, provincial, local	Primary: MELIA system	KII, self-reporting	2023-2024	N/A	Leading up to 2022	≥ 3 policy workshops in each AMD; 40% attendees are women and youth	2025
		Number of collaboratively designed governance strategies, pathways, and innovations								≥ 5 strategies	

	governance policies or strategies	Number of GESI-informed governance methodologies and toolkits								One overview report; ≥ 3 GESI toolkits	
		Number of ongoing programs and projects applying NR-informed food systems governance innovations		National	Primary: MELIA system, National media	Primary,	By end of 2024		Leading up to 2022	≥ 5	
		Increased donor, bilateral and national investments promoting capacities for coherent policy formulation and implementation								≥ 3	
WP4 Outcome 1	Policies and investment plans of 2 key national or international stakeholders demonstrate attention to joined up and GESI-informed land-water-environment governance strategies	Number of joined-up and GESI-informed policies and investment plans attributable to WP4	Generic numbers	National	Primary: MELIA system	Primary, FGD, KIIs	By end of year 2	N/A	N/A	2	2025
WP4 Outcome 2	Capacity of provincial and local public, private and civil society stakeholders to plan, finance and implement GESI-informed food systems governance enhanced in 5 initiatives linked to ongoing land, water, environment projects	Number of GESI-informed land-water governance initiatives implemented in specific location	Generic numbers,	Provincial, local	Primary, MELIA	Primary, FGD, KIIs, qualitative and quantitative analysis	Over the AMD WP4 period 2021-2024	N/A	N/A	≥ 3	2025
		Reports of improved accountability of public, private and grassroots stakeholders	Generic numbers,							≥ 2	
WP4 Outcome 3	More inclusive and climate resilient food systems through increased representation and agency of grassroots actors, particularly women in the design and implementation of joined-up land-water-environment governance initiatives in ongoing projects	Numbers and diversity of local stakeholders engaged in governance initiatives	Generic numbers	Provincial, local	Primary, MELIA	Secondary, Primary, FGD, KIIs, Qual-quant analysis	Over the AMD WP4 period 2021-2024	N/A	N/A	≥ 3 innovative joined-up governance models/ partnerships developed and piloted	2025
		Quality of participation, and cross-sectoral design of Initiative									
WP4 Output 1	Comparative case study syntheses of joined up approaches to water,	Synthesis reports	Numbers and quality of reports	National	Secondary, Primary	Secondary, Primary, FGDs, KIIs	2022	N/A	N/A	≥ 6 datasets in the AMDM 2 peer reviewed	2025

	agriculture, environment governance									publications & 3 policy briefs	
WP4 Output 2	Collaboratively identified entry points and actionable strategies for improving NR-informed food systems governance, with potential for scale up	Number of strategies	Generic numbers Qualitative Analysis	National	MELIA	Institutional documentation	2024	N/A	N/A	At least 2 entry interventions and 2 strategies	2025
WP4 Output 3	GESI-informed governance capacity building modules developed and piloted at national, provincial and local scales	Numbers and content of capacity building modules	Generic numbers	National, provincial, local	Secondary, Primary, MELIA	Secondary, Primary	2023-2024	NA	NA	≥ 5 training / capacity strengthening initiatives	2025
		Numbers of participants (disaggregated by gender, age, locations)									
WP4 Output 4	Capacity and agency strengthening strategies for engaging women and marginalized groups in the design and implementation of joined-up NR-water-food systems governance processes	Numbers of women reporting capacity and agency to inform local planning, design, and implementation interventions	Numbers	Provincial, local	Primary, MELIA	Primary, FGD, KIIs, Qualitative analysis	2022-2024	N/A	N/A	≥ 10 GESI-informed food systems governance strategies	2025
WP4 Output 5	Participatory MEL system to track GESI, climate resilience and institutional performance and accountability of WP4-supported interventions	MEL systems developed for assessing WP4 interventions and outcomes	MEL systems	National, provincial and local	Primary, Most Significant Change Stories	Primary	2022-2024	N/A	N/A	1 design	2025
Work Package 5: Evidence-based delta development planning											
WP5 EoI Outcome	By 2025, high-level policymakers and development partners in at least 2 deltas involved in knowledge integration networks make public statements on the importance of One CGIAR and AMD and engage with AMD to help design climate adaptation-oriented policies, projects and investment plans with the nominal value of at least US$1.8 billion.	Number of high-level stakeholders/ partners/ policy makers making public statements on the importance of 1CG-AMD	Generic Number	Regional	Primary	Media articles	Once at the end of the initiative	N/A	-	9	2025
		Nominal value of investment plans informed by 1CG-AMD science	USD	Regional	Primary	Proposals, policy documents, reports	Once at the end of the Initiative	N/A	-	1.8 billion	

WP5 Outcome 1	Governments develop 3 policy interventions to facilitate inclusive climate-responsive delta development	Policies (number of policies developed by government)	Generic Number	National	Primary	KII	Once at the end of the Initiative	N/A	-	3 policy interventions	2025
WP5 Outcome 2	Development partners develop 3 new projects (or adjust current ones) to maximize climate adaptation and mitigation outcomes in delta development	Number of development partners with developed or adjusted projects	Generic Number	National	Primary	KII	Once at the end of the Initiative	N/A	-	3 new projects	2025
WP5 Output 1	High resolution climate change risk vulnerability maps for Mega-Deltas to inform strategic planning	Data assets (# of climate risk maps developed)	Generic Number	National	Primary data source	AMDs management information system	Annual	N/A	N/A	2 maps	2023
		Data assets (# of climate risk maps enhanced								1 map	2023
WP5 Output 2	Climate action plans for leveraging financing from public and private sector	Data assets (# suitability maps for adaptation-mitigation options developed)	Generic number	National	Primary data source	AMDs management information system	Annual	2	2022	4	2023
		Data assets (# MRV systems enhanced)			Primary data source		Annual	N/A	-	1	2023
		# plans finance-proved			Primary data source		Annual	0	2022	2	2023
WP5 Output 3	Inclusive climate-responsive delta development pathways to guide transformative policies and investments outlined	Policy (# policy briefs discussed with decision makers)	Generic number	National	Primary data source	AMDs management information system	Annual	N/A	N/A	at least 3 policy briefs	2024
WP5 Output 4	Knowledge integration network established which provides effective networks to integrate CGIAR science in delta development strategies	# new partnerships facilitated between 1CG Initiatives and AMD country partners	Generic number	Regional	Primary and secondary	AMD and SG information system	Annual	N/A	2022	at least 3 partnerships	2023
		# scaling opportunities provided		Regional	Primary and secondary		Annual	N/A	2022	10	2024
		# knowledge exchange events organized		Regional	Primary and secondary		Annual	N/A	-	6	2024

6.2 MELIA plan

AMD will implement MEL by means of three components: (1) Internal Learning, (2) Proactive monitoring of progress and evolution of theories of change (TOCs), and (3) Impact Assessment Plans

Internal learning

AMD will track internal learning within WPs by means of six monthly whole-of-Initiative reviews that will cover the following areas in depth:

1. Evolution of TOCs. To evaluate and adjust TOCs in the light of on-going experience within deltas. This will help Ideas and strategies adapt quickly to new evidence and the evolving awareness of partners, while maintaining coherence amongst AMD Work Packages.
2. Scientific review of problems that research addresses. Especially important during early stages of the Initiative to share cross-disciplinary scientific learning amongst WPs to ensure that the research evolves in scope and depth as complex problems are understood better. In some cases, research approaches that appeared appropriate at the outset may require important modification to achieve AMD expectations.
3. Cross-learning to identify entirely new areas of science -sometimes offered to new innovation partners - that promise greater outcomes. For example, rapidly evolving domains such as digital agriculture, high-resolution satellite imagery, phenomics or social media sciences may present unforeseen opportunities to deliver increased outputs.
4. Partner evaluation. We expect institutional learning to present new opportunities to improve TOCs, especially towards the later stages of the Initiative.

Reviews will be supported by: (1) an internal management team, (2) an external advisory panel comprising key stakeholders from AMD and CGIAR, (3) internal database of activities, outputs, partners, and scientific literature to ease monitoring and review of progress and adaptive capacity and (4) data describing the trajectories of conditions in deltas.

Proactive monitoring of progress and evolution of TOCs

Proactive analysis of progress along TOCs will occur by three-monthly updates by WPs to include (1) Progressive tracking of TOCs, (2) Tracking of activities and outputs, (3) Adjustments in TOCs to account for emerging insights of problems, insights and capabilities, and (4) Identification of new opportunities, including new partners, emerging issues of relevance to donors and apparent complementarity / competition with other programs that may advise changes in TOCs.

Impact assessment plans

Detailed impact assessment plans will be prepared by the final year of the Initiative to include:

1. Trajectory of conditions in deltas: Essential background data to any IA in this dynamic situation, which must take into account the conditions that would exist, were no Initiative undertaken.
2. Analysis of expected impacts from specific WPs: Each WP will conduct specific MELIA studies providing data related to indicators listed in the results framework. WP1 and WP5 will conduct stakeholder surveys to identify scalable agronomic practices as well as extrapolation domains across deltas. WP2 will survey consumption preferences disaggregated by gender and social groups and nutrient yields of different production

systems to develop nutrition profiles. WP3 will conduct participatory learning events and provide relevant data through KIIs and workshops. WP3 will further analyze market prospects for DCAS. WP4 will develop a participatory MEL system to track GESI and climate resilience of interventions and institutional performance. WP5 will govern the AMD management information system to track progress across indicators.

6.3 Planned MELIA studies and activities

Type of MELIA study or activity	Result or indicator title that the MELIA study or activity will contribute to.	Anticipated year of completion[1]	Co-delivery of planned MELIA study with other Initiatives	How the MELIA study or activity will inform management decisions and contribute to internal learning
Scaling Readiness Assessment Study (3)	Number of Initiative Innovation Packages that have undergone evidence-based and quality controlled/validated Scaling Readiness assessments informing innovation and scaling strategies	2024	Innovation package linkages with Initiatives UU, ClimBer, Rethinking Food Markets and Value Chains for Inclusion and Sustainability, TAFFSA, and LCSR	The study will inform the design, implementation and monitoring of an innovation and scaling strategy; scaling readiness metrics will be used in an optional innovation portfolio management system.
Learning webinars (3)	Review the TOC, realignment of AMD's strategy, and seizing emerging opportunities in the dynamic policy spaces of climate resilience and agriculture	One per year		Each webinar will end with concrete action points to be implemented the following year
Surveys (2+)	Surveys related to WP deliverables and indicators (WP1: agronomic practices, WP2: nutrition profiles). Area and extent of surveys will be determined during inception phase.	Mid 2024	Some surveys may be developed after discussions with other Initiatives (to be determined during inception phase)	The surveys will help AMD understand the numbers reached and find ways to adjust the strategy accordingly.
Baseline stakeholder surveys/interviews	All policy and program outcomes 2022	2022		Inform overall engagement strategy for AMD WPs
Endline stakeholder surveys/interviews	All policy and program outcomes	2025	With Foresight Initiative (tbd)	Track Initiative outcomes Gauge progress towards achievement of outcome indicators
Participatory MEL system	WP4, output 5	2024	With HER+ (tbd)	Track GESI and climate resilience of interventions and institutional performance
Other MELIA activity MEL routine data to track progress against all relevant outcomes and outputs (see related methods in WP3 and WP5)	All outputs/outcomes in Section 6.1	2024	None	Regular MEL will track AMD progress based on the Results Framework. Data collected will be used for annual internal performance, reviews, reporting and planning

[1] based on 2022-2024 initiative timeline

7. Management plan and risk assessment

7.1 Management plan

Deltaic food systems are complex and dynamic, making it difficult to predict exactly how planned interventions will play out in practice. AMD will be managed in a flexible manner that supports multiple iterations of experiential learning and systematically tests TOC assumptions to support empirically grounded adaptions and course corrections. The AMD leadership team – comprised of the Initiative lead, co-lead, manager, Work Package leads, and MELIA manager – will meet virtually on a quarterly basis to coordinate Initiative management and address emerging challenges and opportunities. This team will be responsible for revising Initiative and Work Package TOCs and the MELIA plan, scaling readiness process and risk management plan, in conjunction with partners and stakeholders, by month six of project inception. These will be revisited every six months to evaluate progress against milestones and targets and to validate/revise assumptions. Continuous collection of monitoring data, plus periodic studies undertaken as a contribution to MELIA (see Section 6.3) will provide additional detailed evidence of:1) Impacts of agronomic and nutrition sensitive interventions, DCAS and bundled services, and innovative NR-water-food system governance arrangements; 2) The extent to which assumptions made in the TOCs are valid (or not). Reporting on progress against MELIA targets will take place annually. Project activities and budgets, TOCs, MELIA, and scaling readiness plans will be adjusted accordingly. Projected benefits and the assumptions that underpin them will be revised annually based on progress made, additional data, and enhanced understanding of uptake.

7.2 Summary management plan Gantt table

Initiative start date:	Timelines													Description of key deliverables
April, 2022	2022				2023				2024				2025	
Work Packages	Q 1	Q 2	Q 3	Q4	Q 1	Q2	Q3	Q4	Q1	Q2	Q3	Q 4	Q1	
Work Package 1: Adapting deltaic production system				1				2					3	1. Spatial analysis for identification and characterization of impact zones and technology targeting for production systems 2. Learning alliances established to mainstream social learning of improved agronomy and VCs for diversified production system 3. Delta-oriented Improved agronomy incorporated at scale
Work Package 2: Nutrition sensitive deltaic agrifood systems					1			1			2		3	1. Enhanced quantitative and qualitative knowledge base on nutrition implications of drivers of food systems transformation 2. Estimates of economic and nutritional costs and benefits of nutrition sensitive policies and practices 3. Delta and agro-ecosystem specific guidelines of implementing nutrition sensitive policies and practices
Work Package 3: De-risking delta-oriented value chains					1				2			2	3	1. VC climate risk and vulnerability assessments to identify inclusive intervention strategies and options for DCAS and complementary services. (India light version) 2. Business models for inclusive DCAS and bundled services (financing, input supply, market access, insurance) for delta-oriented VCs (except India) (concepts year 2; evaluated pilots/profitability year 3) 3. Inclusive and sustainable financing models to support scaling of DCAS and bundled services for delta-oriented VCs (except India)

Work Package 4: Joined-up, gender equitable, inclusive deltaic systems governance						**1**			**2**				**3**	1. DSTs on pathways to NR-informed food systems governance co-designed by public, private and civil society actors, with an intentional focus on gender equality and social inclusion (GESI) 2. Institutional arrangements within a decentralization framework to enable more joined-up governance of NR-informed food system interventions piloted and strategies for scale up identified 3. MEL data and evidence on efficacy and uptake of WP4-supported policy and capacity strengthening interventions and scalable recommendations post project
Work Package 5: Evidence-based delta development planning						**1**		**2**					**3**	1. Climate risk maps developed for Cambodia and Bangladesh 2. Climate action plans endorsed by policy makers in Vietnam 3. Ten high-priority One CGIAR innovations supported for scaling in focus countries in advanced track
Innovation Packages & Scaling Readiness			**1**					**2**		**2** **3**		**2** **3**		1. Innovation Packages defined 2. Seven documented scaling ambitions, vision of success and roadmap for use of scaling readiness for selected core innovations (light track) 3. Three evidence-based scaling readiness assessment reports and related scaling strategies for Innovation Package (standard track)
MELIA				**1** **2**		**1**		**1** **2**		**1**		**1** **2**	**3**	1. Initiative reviews and internal learning tracking within Work Packages 2. Monitoring reports toward output and outcome goals 3. Impact assessment for end-of-Initiative outcomes and other key components of AMD's TOC
Project management		**1**	**2**	**3**			**2**	**3**			**2**		**3**	1. Detailed Implementation work plan 2. Annual financial and technical progress reports 3. Program management meetings

7.3 Risk assessment

Top 5 risks to achieving impact (all Work Packages)	Description	Likelihood	Impact	Risk score	Existing Controls/Mitigations actions or mechanisms	Further controls/ Mitigation actions/ mechanisms to be taken
		1-5	1-5			
Political instability/ conflict or adverse political climate makes operation in target countries unviable	Continued political instability and sanctions imposed by donor countries in Myanmar would make it difficult to conduct activities in country	4	4	16	• Careful design of planned activities in Myanmar • Phased start of activities in Myanmar beginning with remote work	• Exploring possible partnerships with non-governmental organizations and private sector organizations in Myanmar
Unable to incentivize adoption of effective adaptation measures in delta countries by farmers, value chain actors, and policy makers	Entrenched cultural norms and lack of buy-in from smallholders, private sector partners, policy makers, and other stakeholders would prevent AMD and its proposed adaptation measures from reaching critical mass	3	5	15	• Build on widely tested technologies and practices	• Inclusion of a behavioral economist in the project team to explore innovative incentive options
Initiative relies on assumption that pooled funding will be the main source compared to bilateral	Pooled funding is the main funding source for AMD given the lengthy process in mobilizing bilateral funds. Failure to obtain necessary resources from donors would prevent AMD from achieving its intended outcomes.	4	3	12	• Continued requests for assurance that pooled funding will be available • Involvement of donor organizations in the consultation process	• Request for support from One CGAIR Science Group Directors in fundraising
Lack of sense of ownership of the Research and Innovation Strategy by public, private, and civil society stakeholders involved in foresight and priority-setting processes	Failure to engage with critical stakeholders and inability to address local and regional priorities will reduce the efficiency of implementing AMD activities and innovations	3	4	12	• Expanded consultation process with broad participation by stakeholders • Deliberate planning for stakeholder involvement in implementation of activities • Building on strong existing partnerships and relationships	• Strict guideline for AMD to involve national partners in all R4D activities
COVID-19 limits local and international travel and interaction with stakeholders	Travel restrictions and quarantine measures will reduce the ability to have in-country and in-person meetings, causing delays in implementation	3	3	9	• Extensive planning for continuity via virtual meetings and communications and increased use of national consultants	• Consulting key stakeholders on the way forward and reviewing preparedness to address risks

8. Policy compliance, and oversight

8.1 Research governance

Researchers involved in the implementation of this Initiative will comply with the procedures and policies determined by the System Board to be applicable to the delivery of research undertaken in furtherance of CGIAR's 2030 Research and Innovation Strategy, thereby ensuring that all research meets applicable legal, regulatory and institutional requirements; appropriate ethical and scientific standards; and standards of quality, safety, privacy, risk management and financial management. This includes CGIAR's CGIAR Research Ethics Code and to the values, norms and behaviors in CGIAR's Ethics Framework and in the Framework for Gender, Diversity and Inclusion in CGIAR's workplaces

8.2 Open and FAIR data assets

Researchers involved in the implementation of this Initiative shall adhere to the terms of the Open and FAIR Data Assets Policy.

The AMD Initiative will align with the OFDA Policy's Open and FAIR requirements, ensuring:

- Rich metadata conforming to the CGIAR Core Schema to maximize findability, including geolocation information where relevant.
- Accessibility by utilizing unrestrictive, standard licenses (e.g. Creative Commons for non-software assets; General Public License (GPL))/Massachusetts Institute of Technology (MIT) for software) and depositing assets in open repositories.
- Wider access through deposition in open repositories of translations and requiring minimal data download to assist with limited internet connectivity.
- Interoperability by annotating dataset variables with ontologies where possible (controlled vocabularies where not possible).
- Adherence to Research Ethics Code (Section 4) relating to responsible data (through human subject consent, avoiding personally identifiable information in data assets and other data-related risks to communities).

9. Human resources

9.1 Initiative team

Category	Area of expertise	Short description of accountabilities
Cross-cutting		
Research	MELIA manager, specialist	Operationalize MELIA system across WPs and countries
Research	Data Science, GIS specialist, statistician	Design and implementation of modeling and scenario analysis
Support	Initiative Coordinator	Management and coordination of AMD across WPs and countries
Support	Communications manager and specialist	Support communication and dissemination activities
Work Package 1: Adapting deltaic production systems		
Research	Innovation System, Social science, Partnership and Engagement	Establishing Learning alliances to facilitate inclusive social learning around value chain development
Research	GIS, remote sensing, spatial modelling, geo-spatial programming	Suitability assessment and characterization of agri-production systems based on current biophysical and socio-economic profiles
Research	System Agronomy, Economist, Extension Agronomy/Technician	Improved agronomy at scale using decision enabling advisories and approaches for diversified production system
Research	Mechanization and Post-harvest, Socio-economist, Market linkages, Value chain,	Developing agri-business models for selected agriculture value chains
Work Package 2: Nutrition sensitive deltaic agrifood systems		
Research	Economist/Nutritionist	Provide analysis to improve nutrition attributes in food systems
Research	Policy engagement, policy analysis and outreach	Support in developing nutrition sensitive policies, actions, incentives and investments
Research	Anthropologist & gender specialist	Qualitative evaluation of changing behaviors of food systems actors
Research	Survey and data collection	Designing, conducting and analyzing surveys/ ethnographic studies
Research	Foresight modelling	Cost-benefit analysis and modelling
Work Package 3: De-risking delta-oriented value chains		
Research	Value chain climate risk and vulnerability assessment	Coordination with public-private sector value chain (VC) partners, co-designing strategies to reduce VC risks and vulnerabilities
Research	Climate-forecast, climate advisory, digital support systems and platforms	Prioritize and quantify climate risks, support development of improved and inclusive DCAS and bundled services
Research	Financial sector specialist	Development of financing models and partnerships
Research	Research support and data analysis	Support in data collection and analysis
Support	Country coordinator and assistant	Lead coordination and project management in country
Work Package 4: Joined-up, gender equitable, inclusive deltaic systems governance		
Research	Social/Political scientist: policy and institutional analysis, gender equality and social inclusion, anthro-sociologist	Support analysis, recommendations, and activities in relation to policy, gender equality, and social inclusion
Research	Social scientist with GESI training	Promoting inclusive, GESI-informed processes
Research	Institutional specialist	Strengthening capacity of provincial and local stakeholders
Research	Survey and data collection	Designing, conducting and analyzing surveys/ ethnographic studies
Work Package 5: Evidence-based delta development planning		
Research	Crop/Climate modeler, GIS specialist, climate migration specialist	Modeling and scenario analysis for climate action plans & climate risk vulnerability maps
Research	Policy/market, innovations, strategy, agriculture tech. deployment specialist	Development of inclusive climate-responsive delta development pathways, support in knowledge integration network
Support	Partnerships and engagement	Stakeholder coordination in relation to knowledge integration network

9.2 Gender, diversity and inclusion in the workplace

The Initiative team will meet CGIAR's gender target of a minimum of 40% women in professional roles and will also include researchers from diverse backgrounds. Across the 5 WPs, the Initiative will engage at least 40% women researchers, and around 50% of this will comprise mid-career scientists. AMD will ensure that team members from CG partner institutions and new hires will be done by intentionally bridging the gender and diversity gaps. AMD will also build GESI capacity of WP teams during inception and will use One CGIAR G&D tools and training to address unconscious bias and hierarchies in the planning and design of research and outputs.

In addition, the key focus of WP4 is to address social exclusions of marginalized women, youth, and smallholders in food systems innovations at the local community levels, as well as tackle systemic masculinities in NR- and Food Systems institutions. Informed by the CGIAR GENDER Platform and HER+, the AMD adopts a gender transformative lens to ensure that the outcome of AMD is actionable pathways to more inclusive and sustainable NR-Food Systems innovations. This will be achieved by building the capacity of official, non-governmental, private sector and grassroots actors and institutions in the three deltas on Gender Equality and Social Inclusion.

9.3 Capacity development

AMD capacity building will focus on AMD team leaders and selected members of our partner network.

Within the AMD team, all team leaders and project management will complete training on inclusive leadership within three months of launch. Within six months, Initiative team members (including those described above) and leads from partners will complete additional training in GESI and team building. Training will focus on self-awareness and practices that support women, young people and under-represented minorities in the workplace.

Training will include topics related to whistleblowing, power relations and how to escalate concerns to appropriate authorities for review and corrective action. Training will include sessions on CGIAR's values, research ethics, data management, code of conduct and the role of learning within the CGIAR.

Throughout the Initiative, opportunities will be explored to develop the capacity of junior members within AMD and key partner organizations by means of (1) Mentorship programs, (2) Internships for exchange between AMD and partner organizations and (3) a fund for representation at international conferences of junior staff and key partners. These processes will be initiated at a kick-off event for AMD staff and key partners. The management team will be charged with establishing these processes within the first six months and for annual reporting.

Finally, we will build research capacity amongst junior scientists through mentoring by AMD scientists and associates to develop insights from research. Using the legitimacy and relevance of research in AMD, junior scientists will be mentored to publish in international journals.

10. Financial resources

Breakdown per Work Package

USD	2022/2023	2023/2024	2024/2025	Total
Crosscutting across Work Packages	865,386	1,161,489	1,329,642	3,356,517
Work Package 1	1,482,713	2,060,529	2,143,218	5,686,460
Work Package 2	1,356,940	1,781,356	1,973,572	5,111,868
Work Package 3	1,240,321	2,397,976	1,718,630	5,356,927
Work Package 4	1,636,054	1,553,361	1,678,221	4,867,636
Work Package 5	1,278,586	1,895,289	2,056,717	5,230,592
Innovation packages & Scaling Readiness	140,000	150,000	100,000	390,000
Total	**8,000,000**	**11,000,000**	**11,000,000**	**30,000,000**

Breakdown per Geography

USD	2022/2023	2023/2024	2024/2025	Total
Region (Southeast Asia)	4,640,275	5,880,978	6,524,139	17,045,392
Region (South Asia)	3,359,725	5,119,022	4,475,861	12,954,608
Bangladesh	2,084,128	2,388,239	2,765,526	7,237,893
India	1,275,597	2,730,783	1,710,335	5,716,715
Cambodia	1,759,650	2,065,030	2,243,359	6,068,039
Vietnam	1,894,535	2,212,750	2,508,111	6,615,396
Myanmar	986,090	1,603,198	1,772,669	4,361,957
Total	**8,000,000**	**11,000,000**	**11,000,000**	**30,000,000**

Annexes

- **Annex 2.4**: Priority setting: Further details
- **Annex 2.6.1**: Letters of support
- **Annex 2.6.2**: AMD country strategies and priorities
- **Annex 2.6.3**: Ongoing and pipeline donor initiatives
- **Annex 2.6.4**: Interactions with other CGIAR Initiatives
- **Annex 2.7**: Projection of benefits computations and assumptions
- **Annex 3**: Partners (Work Package outputs)
- **Annex 4**: Innovation inventory
- **Annex 5**: Partners (Impact Area)

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