CGIAR | INITIATIVE ON Asian Mega-Deltas

A fisherman in the Mekong River Delta, Viet Nam.
Credit: IRRI

CGIAR Research Initiative on **Asian Mega-Deltas**

Annual Technical Report 2024

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The Artificial Intelligence (AI) software ChatGPT was used to support the editing of parts of this report, specifically to improve clarity, grammar, and style. ChatGPT was not used to generate the content of the report. All edits made with AI assistance were reviewed and validated by the authors to ensure accuracy, coherence, and alignment with the original intent.

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CGIAR Technical Reporting 2024

CGIAR Technical Reporting has been developed in alignment with CGIAR's Technical Reporting Arrangement. This annual report ("Type 1" Report) constitutes part of the broader CGIAR Technical Report. Each CGIAR Research Initiative/Impact Platform/Science Group Project (SGP) submits an annual "Type 1" Report, which provides assurance on progress towards end of Initiative/Impact Platform/SGP outcomes.

As 2024 marks the final year of this CGIAR Portfolio and the 2022-24 business cycle, this Type 1 Report takes a dual approach to its analysis and reporting. Alongside highlighting key achievements for 2024, the report also provides a cumulative overview of the 2022-24 business cycle, where relevant. This perspective captures the evolution of efforts over the three-year period. By presenting both annual and multi-year insights, the report underscores the cumulative impact of CGIAR's work and sets the stage for the transition to the 2025-30 Portfolio.

The 2024 CGIAR Technical Report comprises:

- **Type 1 Initiative, Impact Platform, and SGP Reports:** These annual reports present progress towards end of Initiative/Impact Platform/SGP outcomes and provide quality-assured results accessible via the CGIAR Results Dashboard.
- **Type 3 CGIAR Portfolio Practice Change Report:** This report provides insights into CGIAR's progress in Performance Management and Project Coordination.
- **Portfolio Narrative:** Drawing on the Type 1 and Type 3 reports, as well as data from the CGIAR Results Dashboard, the Portfolio Narrative synthesizes insights to provide an overall view of Portfolio coherence. It highlights synergies, partnerships, country and regional engagement, and collective progress.
- **Type 2 CGIAR Contributions to Impact in Agrifood Systems: evidence and learnings from 2022 to 2024:** This report offers a high-level summary of CGIAR's contributions to its impact targets and Science Group outcomes, aligned with the Sustainable Development Goals (SDGs), for the three-year business cycle.

The Portfolio Narrative informs the 2024 CGIAR Annual Report – a comprehensive summary of the organization's collective achievements, impacts, and strategic outlook.

Elements of the Type 2 report are integrated into the CGIAR Flagship Report, released in April 2025 at CGIAR Science Week. The Flagship Report synthesizes CGIAR research in an accessible format designed specifically to provide policy- and decision-makers at national, regional, and global levels with the evidence they require to formulate, develop, and negotiate evidence-based policies and investments.

The diagram below illustrates these relationships.

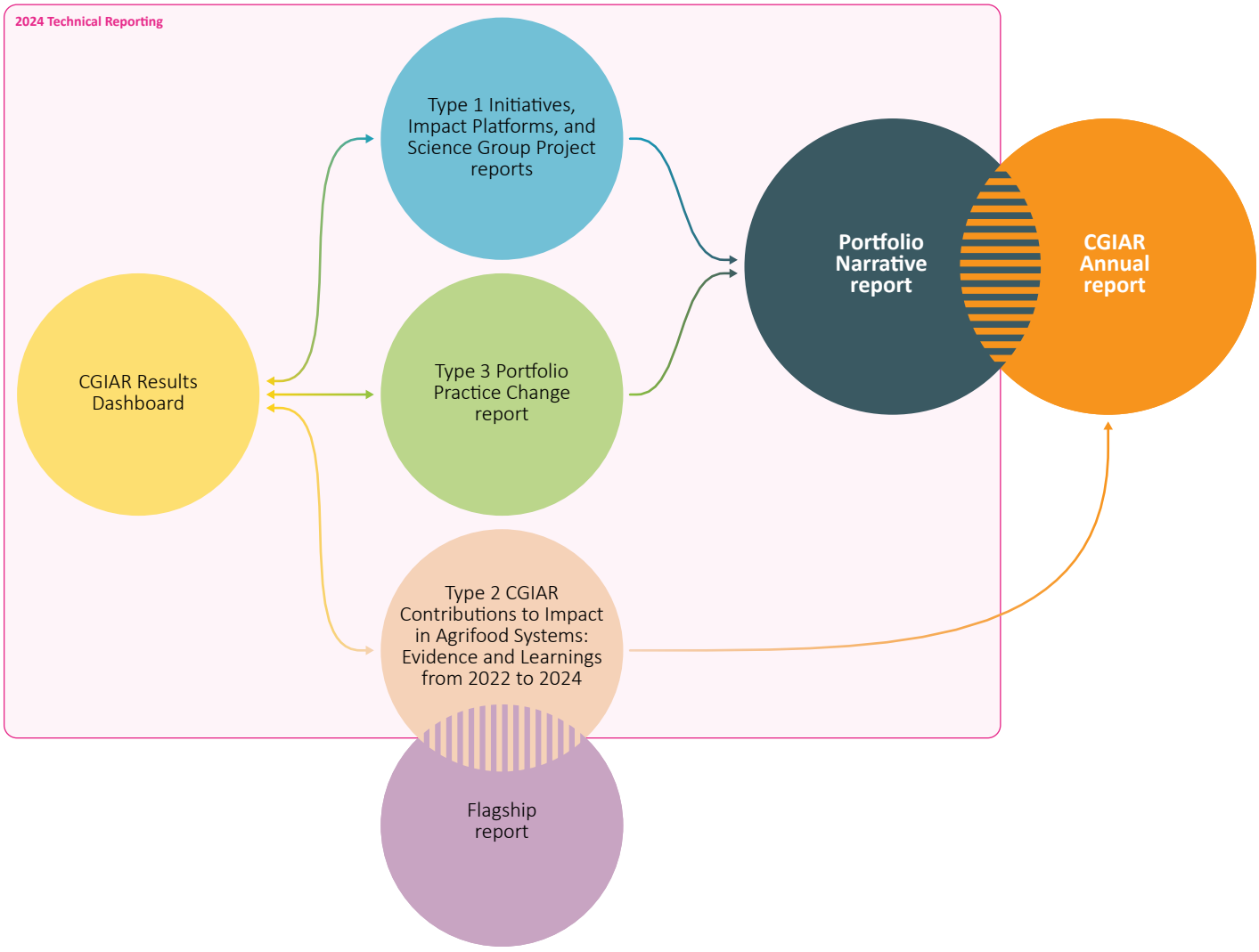


Figure 1. CGIAR's 2024 Technical Reporting components and their integration with other CGIAR reporting products.

Section 1: **Fact sheet, executive summary and budget**

Initiative name	Securing the Food Systems of Asian Mega-Deltas for Climate and Livelihood Resilience
Initiative short name	Asian Mega-Deltas
Initiative Lead	Bjoern Ole Sander (b.sander@irri.org)
Initiative Co-lead	Khondker Murshed-e-Jahan (K.Murshed-e-Jahan@cgiar.org)
Science Group	Resilient Agrifood Systems
Start – end date	01 April 2022 – 31 December 2024
Geographic scope	**Countries** Bangladesh · Cambodia · India · Myanmar · The Socialist Republic of Viet Nam
OECD DAC Climate marker adaptation score[1]	**Score 2: Principal** The activity is principally about meeting any of the three CGIAR climate-related strategy objectives—namely, climate mitigation, climate adaptation, and climate policy—and would not have been undertaken without this objective.
OECD DAC Climate marker mitigation score[1]	**Score 1: Significant** The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives—namely, climate mitigation, climate adaptation and climate policy—even though it is not the principal focus of the activity.
OECD DAC Gender equity marker score[2]	**Score 1B: Gender responsive** On the top of the minimum requirements for 1A, the Initiative/project includes at least one explicit gender equality outcome, and the Initiative/project team has resident gender expertise or capacity. The Initiative/project includes indicators and monitors participation and differential benefits of diverse men and women.
Website link	https://www.cgiar.org/initiative/asian-mega-deltas/

[1] The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) markers refer to the OECD DAC Rio Markers for Climate and the gender equality policy marker. For climate adaptation and mitigation, scores are: 0 = Not targeted; 1 = Significant; and 2 = Principal.
[2] The CGIAR Gender Impact Platform has adapted the OECD gender marker, splitting the 1 score into 1A and 1B. For gender equality, scores are: 0 = Not targeted; 1A = Gender accommodative/aware; 1B = Gender responsive; and 2 = Principal.
These scores are derived from Initiative proposals, and refer to the score given to the Initiative overall based on their proposal.

EXECUTIVE SUMMARY

From 2022 to 2024, the CGIAR Research Initiative on Asian Mega-Deltas (AMD) was active in Bangladesh, Cambodia, India, Myanmar, and Viet Nam, working to develop more resilient, inclusive, and productive delta regions. AMD organized more than 200 capacity-sharing activities, created knowledge products, and developed innovations that benefited more than 8 million farmers. AMD achieved more than 50 outcomes in areas such as policy changes, investments, and the adoption of new innovations, supporting research on diversified production systems, nutrition-sensitive interventions, digital climate advisory and bundled services (DCAS+), socially inclusive policies, and evidence-based delta development planning.

AMD fostered climate-resilient and nutrition-sensitive agricultural systems through activities such as agronomy training, aquaculture support, and integrated rice-fish systems, alongside capacity-building workshops focused on improved farming practices and addressing climate challenges. These efforts included promoting sustainable fish farming, new crop varieties, and strengthened food systems, as well as developing and disseminating agroclimatic bulletins (ACBs) and climate-smart mapping and adaptation planning (CS-MAP) in specific countries and utilizing the Rice Activity Monitoring and Reporting System (RiceMoRe) in Viet Nam. AMD also developed and tested 85 innovations to enhance farming practices, codeveloped climate advisories and digital platforms, and created tools and models for the Mekong and Ganges Delta regions, focusing on salinity, water resources, and climate resilience impact assessments, including the development and promotion of various monitoring, reporting, and verification (MRV) tools.

AMD achieved its End of Initiative (EOIO) outcome targets by scaling up diversification across Viet Nam, Cambodia, Bangladesh, and India through context-specific agronomy packages and climate-resilient innovations, exceeding targets for integrating climate-resilient agriculture into policies and programs. This resulted in widespread adoption of innovations such as alternate wetting and drying (AWD) and climate-risk maps, impacting at least 1,160,000 households (approximately 510,400 hectares) in rice-based farming systems, with other innovations such as potato zero tillage adopted by at least 300 farming households in Bangladesh and Cambodia.

AMD collaborated with diverse partners to promote nutrition-sensitive actions, benefiting approximately 11,000 farmers and informing 52,000 consumers, while also expanding integrated aquaculture-agriculture (IAA) technologies to 10,234 farmers across 1,907 hectares in Bangladesh and focusing on policy integration and capacity building in Cambodia. These collaborations included partnerships with organizations to influence policies in Bangladesh and Cambodia and to integrate nutrition-sensitive agriculture into national programs in Viet Nam.

AMD utilized various delivery channels, leveraging innovations and partnerships with public and private institutions, to provide digital climate advisories to smallholder farmers and fisherfolk, including the co-development and dissemination of ACBs in Viet Nam, supported by approximately US$51,000 investment from public institutions, and enhanced DCAS in Bangladesh, Cambodia, Myanmar, and Viet Nam through digital platforms. Collaboration with the Department of Crop Production (DCP) in Viet Nam led to climate advisories reaching 290,000 farmers in the Mekong Delta, while digital platforms such as Htwet Toe in Myanmar and Agvisely in Bangladesh provided advisories, demonstrating the cost-effectiveness of these services.

AMD research, conducted with local partners in Bangladesh and Cambodia, led to policy and strategy changes regarding water management and food systems governance, addressing issues such as policy ambiguity impacting freshwater access in Bangladesh and disjointed water management in Cambodia. AMD's strategic engagements and policy dialogues in target countries fostered a more integrated, gender-equitable, and socially inclusive approach to food systems and natural resource governance.

AMD significantly advanced climate-responsive development in Asian mega-deltas, earning recognition from the Vietnamese government, by aligning scientific research with policy and implementation through strategic data development and stakeholder engagement. Key achievements included integrating AMD science into government policy, such as the implementation of CS-MAP in Viet Nam's Green Growth Strategy, scaling RiceMoRe in Viet Nam, and promoting climate-smart practices through various initiatives.

AMD prioritized gender equality and social inclusion (GESI) through various efforts, including workshops and training on gender and climate resilience, support for women's programs such as digital extension services, promotion of gender-inclusive practices in agriculture, and initiatives focused on climate justice.

AMD achieved these outcomes through strategic partnerships with key stakeholders, collaborating successfully with a diverse network of nearly 200 partners across its operational countries, including government agencies, research institutes, academic institutions, international organizations, and funding agencies. As a Regional Integrated Initiative (RII), AMD integrated other CGIAR Initiatives operating within the region through joint activities and fostered collaboration and capacity building by organizing the inaugural CGIAR Science Day in Viet Nam and co-facilitating a workshop on CGIAR's Innovation Package and Scaling Readiness to equip development practitioners.

AMD actively engaged in global and national policy events to promote agricultural transformations and climate-resilient food systems, including organizing side events at UNFCCC COP27, COP28, and COP29 and contributing to international conferences. AMD also fostered active engagement with stakeholders through various platforms and modalities, holding annual meetings, country consultation workshops, and the Delta Talks webinar series.

AMD produced 290 openly accessible knowledge products, including journal articles, research reports, policy briefs, technical guidelines, manuals, and training materials, and distributed quarterly newsletters. The AMD team comprised almost 100 staff members from seven CGIAR Centers.

	2022	2023	**2024**
PROPOSAL BUDGET	$8.00M	$11.00M	**$11.00M**
APPROVED BUDGET [1]	$3.99M	$6.92M [2]	**$6.97M** [2]

[1] The approved budget amounts correspond to the figures available for public access through the Financing Plan dashboard.
[2] These amounts include carry-over and commitments.

Demonstration of mechanical rice straw collection by AMD in Cambodia.
Credit: IRRI

Initiative-level theory of change diagram

This is a simple, linear, and static representation of a complex, non-linear, and dynamic reality. Feedback loops and connections between this Initiative and other Initiatives' theories of change are excluded for clarity.

CHALLENGE STATEMENT

- The densely populated Asian Mega Deltas are biodiverse, fertile, and productive food baskets dominated by rice, fisheries, and aquaculture that support millions beyond the region. It is the world´s most important rice-growing area. However, delta food systems are reaching a significant tipping point. While governments look to deltas to achieve national development goals for food security, nutrition, and poverty alleviation, small-scale producers face grave risks from the impacts of climate change, aggravated by the effects of inappropriate development pathways. The Asian Mega Deltas are likely to be significantly impacted by climate change, including more frequent and intense floods, salinization, water shortages, and climate extremes that will slow economic growth, further erode food security, and trigger new poverty traps and emerging hotspots of hunger. Along with other stresses, this has led to an annual loss of 6 percent in Southeast Asia's GDP—more than twice the global average.
- The CGIAR Research Initiative on Securing the Food Systems of the Asian Mega-Deltas for Climate and Livelihood Resilience (AMD) addresses the challenge of system barriers at the community, national, and regional levels to facilitate scaling for existing/emerging technologies and practices for transforming food systems toward greater climate resilience. Through this underlying precept, AMD aims to support the creation of resilient, inclusive, and productive deltas. Transformed food systems also need to provide pathways out of poverty for millions, as has happened previously in certain parts of the Asian Mega Deltas. Given the risks of accelerated change, the AMD Initiative addresses challenges to nutrition security, financial investment, gender equity and social inclusion, and the natural resources on which the resilience of the entire system depends. It does so by building strong policy–science partnerships, working with diverse actors, and aligning them with common goals.

SPHERE OF **CONTROL**

Work Packages

Work Package 1

Adapting deltaic production systems.

Work Package 2

Nutrition-sensitive deltaic agri-food systems.

Work Package 3

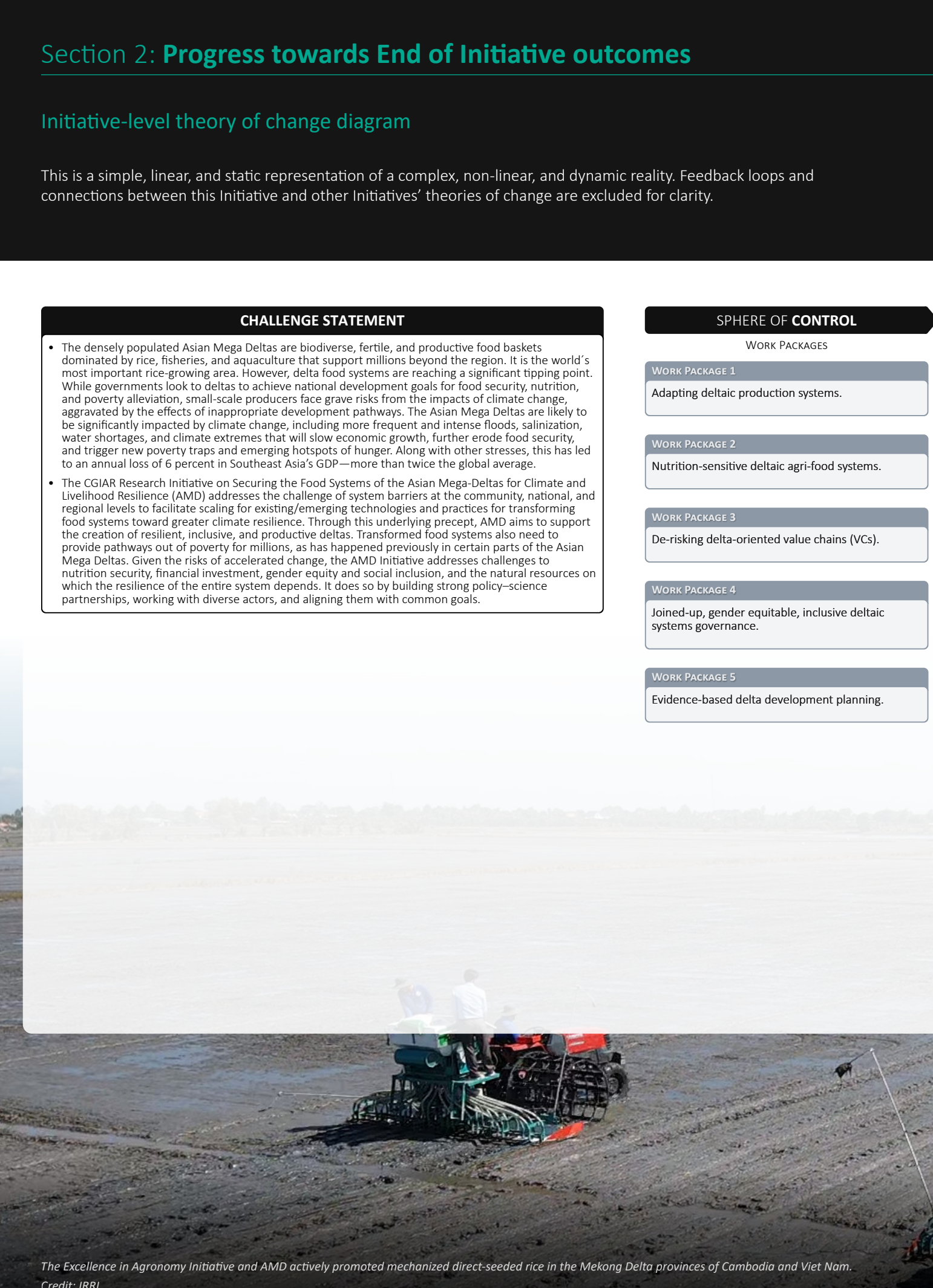
De-risking delta-oriented value chains (VCs).

Work Package 4

Joined-up, gender equitable, inclusive deltaic systems governance.

Work Package 5

Evidence-based delta development planning.



The Excellence in Agronomy Initiative and AMD actively promoted mechanized direct-seeded rice in the Mekong Delta provinces of Cambodia and Viet Nam. Credit: IRRI

SPHERE OF **INFLUENCE**

End-of-Initiative Outcomes

End-of-Initiative Outcome 1

Scaling-up diversification.

End-of-Initiative Outcome 2

Nutrition sensitive interventions.

End-of-Initiative Outcome 3

Digital climate advisory.

End-of-Initiative Outcome 4

Policies and strategies.

End-of-Initiative Outcome 5

Climate adaptation-oriented policies.

Action Area Outcomes

Systems Transformation

1 3 4 5 **1** · Research institutions, government analytical units, and scaling partners in the Global South have improved knowledge, skills, access to data, capacity to develop tools, innovations, and undertake research to support transformation of food, land and water systems contributing to livelihood, inclusion, nutrition, environmental and climate objectives.

2 5 **2** · Due to CGIAR involvement, private sector actors invest in business practices or models that have the potential to improve livelihoods, climate resilience, promote sustainable and inclusive food systems, and boost consumption of healthy diets, especially among nutritionally vulnerable population groups.

1 3 4 5 **3** · National and local multi-stakeholder platforms are strengthened to become more effective and sustainable, addressing development trade-offs and generating strategies for effective food, land, and water systems transformation.

Resilient Agrifood Systems

1 5 **4** · National and sub-national government agencies use CGIAR research results to design or implement strategies, policies and programs which have the potential to transform food, land and water systems contributing to livelihood, inclusion, nutrition, environmental and climate resilience objectives.

4 5 **5** · CGIAR partners develop and scale innovations that contribute to the empowerment of women and other social groups in food, land, and water systems.

SPHERE OF **INTEREST**

Impact Areas

Nutrition, Health & Food Security

1 2 3 4 · End hunger for all and enable affordable health diets for the 3 billion people who do not currently have access to safe and nutritious food.

Poverty Reduction, Livelihoods & Jobs

1 3 4 · Reduce by at least half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.

· Lift at least 500 million people living in rural areas above the extreme poverty line of US $1.90 per day (2011 PPP).

Gender Equality, Youth & Social Inclusion

3 5 · Close the gender gap in rights to economic resources on, access to ownership of, and control over land and natural resources, for more than 500 million women who work in food, land, and water systems.

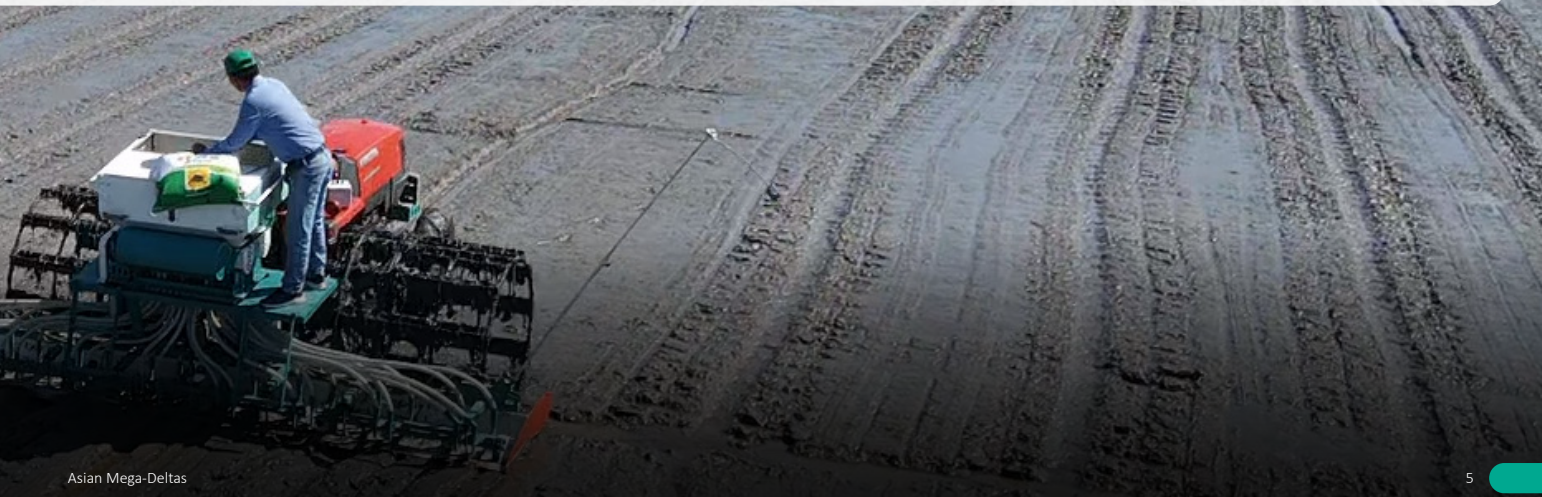
· Offer rewardable opportunities to 267 million young people who are not in employment, education, or training.

Climate Adaptation & Mitigation

1 3 4 · Equip 500 million small-scale producers to be more resilient to climate shocks, with climate adaptation solutions available through national innovation systems.

Environmental Health & Biodiversity

1 2 3 4 · Stay within planetary and regional environmental boundaries: consumptive water use in food production of less than 2500 km3 per year (with a focus on the most stressed basins), zero net deforestation, nitrogen application of 90 Tg per year (with redistribution towards low-input farming systems) and increased use efficiency, and phosphorus application of 10 Tg per year.



Asian Mega-Deltas

Participatory risk mapping and adaptation planning in the coastal region of Bangladesh. Credit: IRRI

Summary of progress against the theory of change

From 2022 to 2024, the AMD Initiative actively worked across Bangladesh, Cambodia, India, Myanmar, and Viet Nam to foster resilient, inclusive, and productive delta regions. Over these three years, AMD conducted more than 200 capacity development activities, providing training to almost 40,000 stakeholders. AMD generated knowledge products and developed and enhanced innovations, supporting the reach of more than 8 million farmers. AMD achieved more than 50 outcomes in policy, investment, and innovation adoption. These efforts, encompassing 892 outputs and outcomes, supported various research areas, including establishing learning alliances for diversified production systems, promoting nutrition-sensitive interventions, developing DCAS+, designing socially inclusive policies, and supporting evidence-based delta development planning.

AMD fostered climate-resilient and nutrition-sensitive agricultural systems in its priority countries through a wide range of capacity-sharing activities. These included agronomy training, aquaculture support, the implementation of integrated rice-fish systems, and capacity-building workshops focused on improving farming practices and addressing climate challenges. Activities also ranged from promoting sustainable fish farming and new crop varieties to strengthening nutrition-focused agricultural and food systems. To enhance climate resilience, training workshops and stakeholder meetings in Viet Nam, Myanmar, and Cambodia focused on developing and disseminating ACBs. In Bangladesh and Cambodia, workshops promoted CS-MAP, while in Viet Nam, training sessions taught agricultural officers to use the RiceMoRe to improve rice production management and reporting.

AMD developed and tested 85 innovations to enhance farming practices, including diversified cropping systems in Bangladesh and saline-tolerant potato cultivation in Bangladesh and India. In Viet Nam, AMD codeveloped climate advisories and digital platforms, while also creating livestock advisories for Bangladesh and exploring private DCAS models in Myanmar. Furthermore, AMD created tools and models for the Mekong and Ganges Delta regions, focusing on salinity, water resources, and climate resilience impact assessments. AMD also supported the development and promotion of various MRV tools in Viet Nam, including RiceMoRe.

Through these research activities, AMD achieved its EOIO outcome targets. AMD scaled up diversification by developing and adapting improved agronomy packages for delta systems in Viet Nam, Cambodia, Bangladesh, and India, focusing on climate-resilient innovations, diversification options, and optimized farming systems. In Viet Nam, this involved climate-smart innovations for rice-based systems, such as mechanized direct-seeded rice (mDSR) and rice straw-based circular economy, while in Cambodia and India, diversification options were prioritized, and in Bangladesh, the focus was on optimizing polder farming. These efforts included testing new crop varieties, improving water management, and promoting diversified systems such as rice-watermelon and rice-sweet potato. AMD also exceeded its targets for integrating climate-resilient agriculture into national and subnational policies and programs through research, partnerships, and capacity development. This resulted in the scaling of AWD and climate-risk maps and adaptation planning to reach at least 1,160,000 households (approximately 510,400 hectares) and 3,250,000 households (approximately

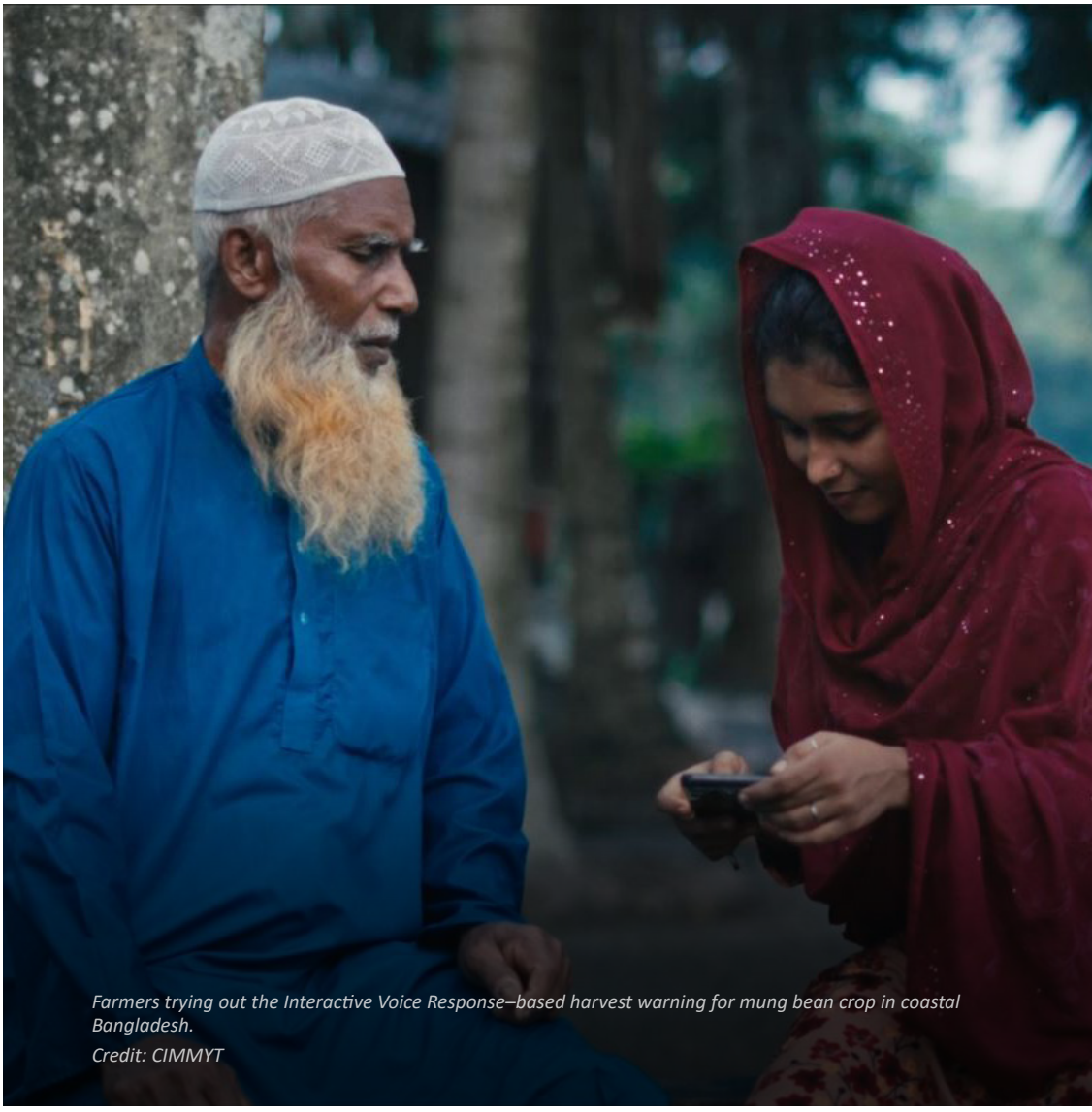
1,430,000 hectares) in rice-based farming systems, and other innovations such as potato zero tillage were adopted by at least 300 farming households in Bangladesh and Cambodia.

AMD collaborated with national government agencies, research institutions, nongovernmental organizations (NGOs), and private-sector partners to promote nutrition-sensitive actions, benefiting approximately 11,000 farmers and informing 52,000 consumers through surveys, training, and policy advocacy. Partnerships with organizations such as the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and Cambodia Development Resource Institute (CDRI) influenced regional policies in Cambodia and Bangladesh, while collaborations in Viet Nam with the Department of Cooperatives and Rural Development (DCRD) and the National Institute of Nutrition (NIN) integrated nutrition-sensitive agriculture into national programs. In Bangladesh, AMD expanded IAA technologies to 10,234 farmers across 1,907 hectares, enhanced fish genetics, and introduced new sweet potato varieties, leveraging US$170,000 in private funding and training 102 community health workers to reach 52,500 rural household members. AMD's work in Cambodia focused on policy integration, data-driven interventions, and capacity building, including the development of guidelines and piloting integrated home-based production models benefiting 850 households.

AMD utilized various delivery channels to provide DCAS to smallholder farmers and fisherfolk, leveraging innovations and partnerships with public and private institutions. These partnerships facilitated the co-development and dissemination of ACBs in Viet Nam, supported by approximately US$51,000 investment from public institutions, and enhanced DCAS in Bangladesh, Cambodia, Myanmar, and Viet Nam, reaching approximately 846,000 farmers through digital platforms. In Viet Nam, collaboration with the DCP led to climate advisories reaching 290,000 farmers in the Mekong Delta, while in Cambodia, the local technical agroclimatic committees (LTAC) model scaled to reach 16,508 farmers. Digital platforms such as Htwet Toe in Myanmar and Agvisely in Bangladesh provided advisories to farmers, demonstrating the cost-effectiveness of these services. AMD successfully built partnerships to improve and scale climate services, though developing sustainable financial models, particularly for women, remains a challenge.

AMD research, conducted with local partners in Bangladesh and Cambodia, led to policy and strategy changes regarding water management and food systems governance. In Bangladesh, research findings on policy ambiguity impacting freshwater access were presented at a national policy dialogue workshop, and AMD was contributing to new women's and fisheries policies. In Cambodia, research highlighted disjointed water management, leading to the piloting of district technical working groups (D-TWGs), which were recognized by the government for nationwide adoption following a national dialogue. AMD's strategic engagements and policy dialogues in target countries fostered a more integrated, gender-equitable, and socially inclusive approach to food systems and natural resource governance. AMD also piloted the use of CS-MAP for province-level policy decisions related to risk and recommendations for diversification in areas with drought risk. This was tied with farmer-participatory experiments on vegetable growing and use of rice straw-based compost.

AMD significantly advanced climate-responsive development in Asian mega-deltas, earning recognition from the Vietnamese government, by aligning scientific research with policy and implementation through strategic data development and stakeholder engagement. A key achievement was the integration of AMD science into government policy, notably with the implementation of CS-MAP in Viet Nam's Green Growth Strategy, AWD in the Nationally Determined Contributions (NDCs), and the development of the CS-MAP Atlas for the Mekong and Ganges-Brahmaputra regions.



Farmers trying out the Interactive Voice Response–based harvest warning for mung bean crop in coastal Bangladesh.
Credit: CIMMYT

The RiceMoRe system was institutionalized and scaled in Viet Nam, covering approximately 75 percent of the rice planting area, and IRRI's innovations on carbon market entry points were adopted in low-emission projects. AMD also fostered climate change mitigation efforts, enhanced local capacities through community-level evaluations and workshops, and promoted climate-smart practices through knowledge networks and participation in international forums.

AMD prioritized GESI by conducting gender and climate resilience workshops and providing gender-responsive training on agronomy and aquaculture. Efforts included women-to-women digital extension services, gender-inclusive climate-smart plan validation, agricultural mechanization to aid women and youth, climate justice and gender equality initiatives, and promotion of a zero-tillage potato method. In Bangladesh, AMD also conducted a baseline assessment of farm, household, gender, and socioeconomic attributes and developed a framework for gender-sensitive and participatory validation. AMD also conducted GESI training for partners, developed gender-responsive sampling and research design, and collaborated with CGIAR's GENDER Impact Platform for research on climate–gender–agriculture hotspots in Bangladesh.

RiceMoRe training for local agricultural officers in the Mekong Delta, Viet Nam. Credit: IRRI

Strategic partnerships with key stakeholders pushed AMD to achieve these outcomes. AMD successfully collaborated with a diverse network of nearly 200 partners across its operational countries, including government agencies, research institutes, academic institutions, international organizations, and funding agencies. In Viet Nam, a strong partnership with the Ministry of Agriculture and Rural Development (MARD) and its agencies was crucial for implementing various activities, from the One Million Hectares for Low-Emission and High Quality Rice (1mHa) Program to scaling mDSR and promoting a rice straw-based circular economy. AMD also forged key collaborations with government agencies in Bangladesh, Cambodia, and India, alongside international NGOs, academic institutions, and private-sector companies, to advance agricultural and development initiatives.

As an RII, AMD served as a platform for integrating other CGIAR Initiatives operating within the region. AMD implemented several joint activities with CGIAR Research Initiatives such as Aquatic Foods; Climate Resilience; Excellence in Agronomy; Fragility, Conflict, and Migration; Low-Emission Food Systems; Mixed Farming Systems; Plant Health; and Transforming Agrifood Systems in South Asia. AMD also organized the inaugural CGIAR Science Day in Viet Nam in 2023 to facilitate in-depth discussions and presentations on the latest research findings and innovations from CGIAR Initiatives working in the country. Additionally, AMD cofacilitated a workshop on CGIAR's Innovation Package and Scaling Readiness to equip development practitioners with transformative strategies for scaling agricultural solutions in the region.

AMD engaged in significant global and national policy events to promote agricultural transformation and climate-resilient food systems. In 2022, AMD organized events at UNFCCC COP27 focusing on agricultural transformations in Asian mega-deltas and digital climate services for resilient food systems, as well as presenting on bridging the climate finance gap for smallholders. This engagement continued in 2023 with a side event at COP28 on collaborative solutions for climate impacts in Asian mega-deltas, and in 2024 with a side event at COP29 titled South-South Collaboration on Addressing Loss and Damage. AMD contributed to a range of events, such as the 2023 International Rice Congress, the Gobeshona Global Conference (South Asia Resilience Hub Virtual Event) in both 2023 and 2024, AGRITECHNICA Asia and AGRITECHNICA Asia Live, and the 2023 International Conference on Water and Flood Management.

AMD also fostered active engagement with stakeholders through various platforms and modalities. AMD held its annual meeting and pause, reflect, and plan workshop every year in Viet Nam, Cambodia, and Bangladesh, respectively, with participation from key partners and stakeholders. Country consultation workshops and CGIAR listening sessions were also conducted. The Delta Talks webinar series, co-organized by AMD and Wageningen University & Research, conducted 17 webinar sessions facilitating the joint exchange of research outcomes.

AMD also produced a total of 290 knowledge products, all of which were made openly accessible online, documenting the development and results of AMD research. These products range from journal articles and research reports to policy briefs, technical guidelines and manuals, and training materials. Quarterly AMD newsletters were also distributed to provide news, multimedia, and knowledge products, ensuring comprehensive and transparent communication with stakeholders.

The AMD team comprised almost 100 staff members from seven CGIAR Centers: the Alliance of Bioversity International and CIAT, International Food Policy Research Institute, International Maize and Wheat Improvement Center, International Potato Center (CIP), International Rice Research Institute, International Water Management Institute, and WorldFish.

Demonstration of mechanical rice straw collection by AMD in Cambodia.
Credit: IRRI

Progress against End of Initiative Outcomes

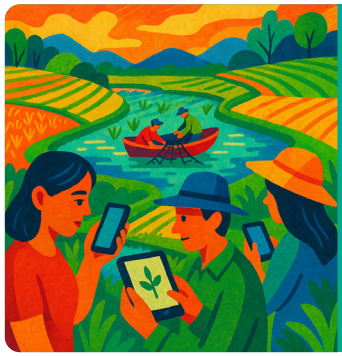
This infographic provides a concise summary of the Initiative's progress toward achieving its Theory of Change End-of-Initiative outcomes for the 2022-2024 period. By drawing on reported results, it offers a comprehensive synthesis of progress made against the established outcome targets, highlighting the Initiative's overall impact and key achievements at the conclusion of this three-year cycle.

EOIO 1

By 2025, a network of inclusive learning alliances comprised of at least 200 stakeholders and 30 organizations in each delta, and supported by at least three national/subnational policies, actively scale up diversification of agrifood systems in deltas, to accelerate adaptation by 10,000 smallholders and improve management of 31,000 hectares of land.

EOIO 2

By 2025, national ministries and major NGOs in at least three countries use AMD coproduced knowledge and evidence to table at least three cost-effective nutrition-sensitive actions/business cases for scaled-up implementation among 10,000 producers (80 percent women) and 50,000 consumers.



EOIO 3

By 2025, improved DCAS+ to prevent and mitigate the impact of climate and disaster risks in delta countries scaled out by public and private-sector partners are used by ≥ 300,000 smallholders (≥29 percent women), with at least one financing partnership plan established to assure sustainability and further scaling.

EOIO 4

By 2025, policies and strategies of at least three government and/or development partners in the AMD regions are informed by codesigned action research on socially inclusive and gender-equitable natural resources and food systems.

EOIO 5

By 2025, climate adaptation-oriented policies, projects, and investment plans informed by CGIAR and AMD science worth at least US$450 million are designed, financed, and under implementation by partners in two deltas.

AMD exceeded its EOIO outcome targets on catalyzing uptake of recommended strategies and innovations for climate-resilient agriculture into national and subnational policies and programs and their farm-level adoption. This was done through extensive research and scaling efforts reinforced by strategic partnerships, engagement, and capacity development with relevant stakeholders. In Viet Nam, capacity development and other engagement activities led to the integration of innovative approaches such as MRV, mDSR, and rice straw management into the strategies and approaches of the 1mHA Program spearheaded by MARD. Further, AMD supported the scaling of AWD and CS-MAPs to reach at least 1,160,000 households (approximately 510,400 hectares) and 3,250,000 households (approximately 1,430,000 hectares) for improved agronomy in rice-based farming systems. In Bangladesh, the business model on the provision of agricultural mechanization through local service providers facilitated mechanized harvesting in around 70 hectares of rice production areas. Other innovations for improved agronomy such as potato zero tillage, rice straw management, and homestead vegetable gardening were adopted by at least 300 farming households in Bangladesh and Cambodia.

AMD tapped national government agencies, research institutions, NGOs, and private-sector partners in target countries to use AMD coproduced knowledge and evidence to mainstream cost-effective nutrition-sensitive actions and business cases for scaling to farmers and consumers. AMD's activities, including extensive surveys, training, policy advocacy, and pilot projects, benefited around 11,000 farmers and informed 52,000 consumers about nutrition-focused agriculture. AMD partnered with organizations such as icddr,b, CDRI, and CTUMP to significantly influence regional policies, including Cambodia's National Strategy for Food Security and Nutrition and Bangladesh's National Food Policy, by integrating evidence-based nutrition-sensitive practices. In Viet Nam, collaborations with DCRD and NIN resulted in the formal integration of nutrition-sensitive agriculture guidelines into the Poverty Reduction National Target Program and the development of a Mekong River Delta food systems profile. WorldFish's cost-effectiveness research, adopted by AMD partners in Bangladesh and Cambodia, generated guidelines for scalable nutrition interventions in aquaculture. AMD transitioned to large-scale implementation in Bangladesh, extending IAA technologies to 10,234 farmers across 1,907 hectares and leveraging US$170,000 in private funding for the 2024 production cycle. To enhance nutrition, AMD introduced improved G3 rohu fish genetics and three new micronutrient-rich sweet potato varieties. Furthermore, 102 community health workers were trained, reaching 52,500 rural household members, with a focus on pregnant and lactating women.

AMD explored various delivery channels for providing DCAS to smallholder farmers and fisherfolk in target countries to ensure wider reach in a cost-effective manner. The Initiative leveraged existing innovations and strengthened partnerships with public and private institutions to de-risk production systems and value chains. From 2022 to 2024, partnerships and engagement activities resulted in approximately US$51,000 investment from public institutions to support the co-development and dissemination of ACBs in Viet Nam. Similarly, partnerships with public institutions (two national; 15 subnational) and the private sector (three companies; one international development organization) enabled the enhancement and further scaling of DCAS tailored to the contexts of target intervention areas and users in Bangladesh, Cambodia, Myanmar, and Viet Nam. This allowed the Initiative to reach approximately 846,000 farmers (including fishers) through different digital platforms. In Myanmar, farmers provided with DCAS showed repeated adoption of recommended farming practices that led to avoidance of losses and significant yield and income advantage. Moreover, access to timely DCAS boosted farmers' confidence in managing climate risks.

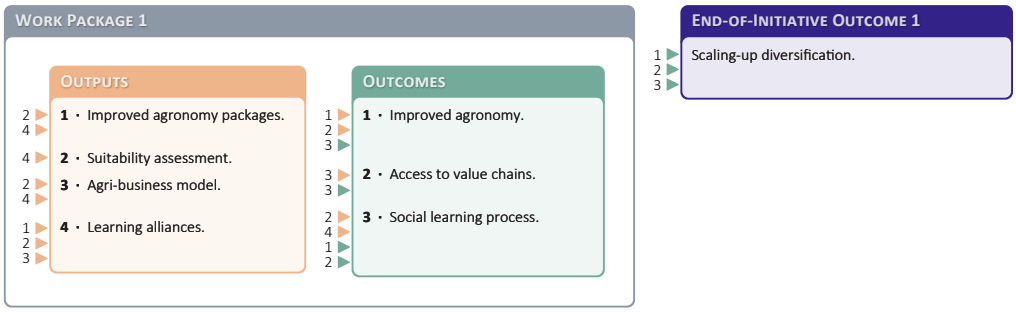
A more integrated, gender-equitable, and socially inclusive food systems governance approach was catalyzed in target countries. This was achieved through strategic engagements and policy dialogues with policymakers at national and subnational levels based on science-based recommended approaches and innovations for transforming food systems and natural resource governance. The Initiative was able to secure commitments from the Department of Fisheries of Bangladesh and Fisheries Administration of Cambodia to support actionable pathways toward a more sustainable and inclusive food system and water governance. Further, in Cambodia, the Initiative's multiscale and multistakeholder approach through the formation of TWGs to facilitate decentralized food system governance informed the water resources management plans for the community fish refuge and lakes. The management plans covered all water uses and ensured that different gendered needs were represented, as well as how decision-making spaces over water resources can empower women to be active participants.

AMD science and evidence were taken up in policies, plans, and programs of government institutions and partners to further promote climate-responsive delta development in the region. In Viet Nam, high-level officials publicly recognized the contribution of AMD's research, innovations, and scaling efforts in shaping climate adaptation and mitigation policies and strategies. RiceMoRe was institutionalized by the national government, prompting sustainable investments for scaling to 28 provinces to cover approximately 75 percent of Viet Nam's rice planting area. Other AMD innovations such as CS-MAP gained interest from governments of Bangladesh and Cambodia. In Thailand, the AMD-promoted low-emission rice production was included as a mitigation strategy in its NDC. To further catalyze climate financing, the Initiative pursued extensive engagements with international donors, governments, private-sector partners, and other stakeholders through knowledge networks, policy dialogues, and capacity development to present AMD science and innovations. In 2023, convinced by AMD's work and potential to combat climate change, the New Zealand government allocated approximately US$18 million to AMD to support its efforts to promote climate-resilient and productive food systems. AMD's data and tools facilitated significant funding for climate resilience and low-emission rice initiatives in Viet Nam, Cambodia, and Bangladesh, totaling more than US$1 billion from the United States Agency for International Development (USAID), Global Environmental Facility (GEF), and World Bank.

WP1: Adapting Deltaic Production Systems

Research Questions

- What are the best-bet production systems for deltaic climate adaptation and mitigation?
- How can learning alliances best facilitate social learning around agricultural innovations to support climate adaptation and resilience?
- Who are the key actors that need to be involved to scale diversified production systems?
- What roles and capacities are required of supply chain actors to support the diversification of production systems, and how can these be strengthened?
- Which existing underutilized agronomic innovations and knowledge can be modified and scaled to enhance climate resilience?
- Can community-based or collective agri-business models be used to facilitate scaling of diversified production systems?



Work Package 1 progress against the theory of change

WP1 formulated, designed, developed, tested, and adapted improved agronomy packages with stakeholders for delta systems in Viet Nam, Cambodia, Bangladesh, and India.

In Viet Nam, the focus was on enhancing rice-based systems with innovations such as mechanized direct seeding and the rice straw-based circular economy, which were included in national technical guidelines. Work in Viet Nam also included breeding trials for short-duration sweet potatoes. Scaling and enhancement of existing innovations for climate-resilient agriculture (such as alternate wetting and drying, climate risks maps) was pursued through extensive engagement and partnerships.

In Cambodia, trials and demonstrations focused on crop diversification options, including rice-watermelon, rice-sweet potato, rice-prawn, and rice-fish farming systems, with the development of extension materials and monthly crop suitability mapping.

In Bangladesh, efforts centered on improving farming system agronomy in polder regions by optimizing drainage and irrigation to extend the growing season and enable the use of short-duration rice varieties followed by various cropping options (such as chili, maize, mung bean). Testing included the use of nano-urea, nano-DAP, and bio-fertilizer, and new micronutrient-rich varieties of sweet potato

In India, optimized agronomy packages were tested and demonstrated for improved rice, jute, and mustard varieties. Climate-resilient land shaping technology was developed for lowland rice landscapes, and potato zero tillage with rice straw mulch was tested. These improved, climate-resilient agronomy packages contributed to climate change adaptation and mitigation across these regions.

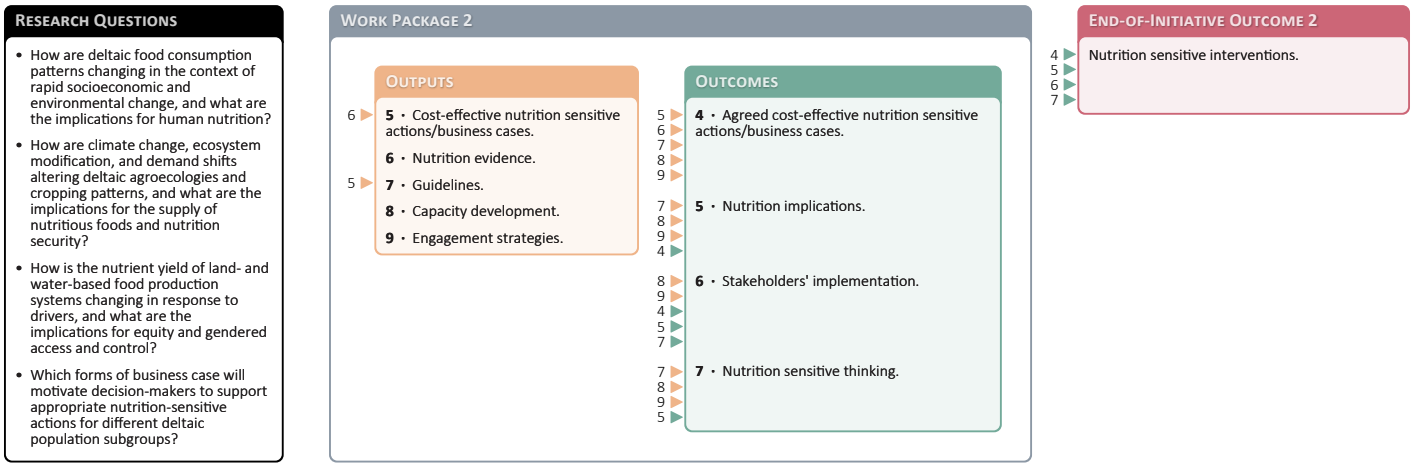
High-resolution suitability assessments of agrifood production systems, guided by land characterization, informed work on improved agronomy packages.

Scalable agribusiness models, such as the “wife-husband” model in Bangladesh and models for rice-watermelon and rice-sweet potato production systems in both Bangladesh and Viet Nam, were identified and deployed. In Cambodia, an innovative approach scaled climate-resilient agriculture through start-up businesses supported by Impact Hub Phnom Penh. This business incubator program targeted youth through entrepreneurship in agriculture.

Learning alliances in Bangladesh, Cambodia, and Viet Nam facilitated gender-inclusive social learning around value chain development. WP1 also used other methods, such as cooperatives in Viet Nam, to work with farmer groups to develop and scale climate-resilient innovations.

Within-Initiative outcomes included mainstreaming gender-inclusive social learning processes, partners incorporating improved agronomy at scale, and scaling partners gaining improved access to value chain facilities/services. While evidence suggests progress varied across countries, partners in Viet Nam incorporated improved agronomy, and scaling partners improved access to value chain facilities/services, whereas in Cambodia and Bangladesh, demand and scaling partners focused on mainstreaming gender-inclusive social learning processes.

WP2: Nutrition-Sensitive Deltaic Agrifood Systems



Work Package 2 progress against the theory of change

WP2 significantly advanced nutrition-sensitive interventions across Bangladesh, Cambodia, and Viet Nam, focusing on enhancing food security, dietary diversity, and sustainable agriculture through collaborative partnerships. From 2022 to 2024, the project directly impacted approximately 11,000 farmers and reached 52,000 consumers with nutrition-sensitive agricultural solutions and improved nutrition messaging. AMD played a pivotal role in policy influence, shaping Cambodia's National Strategy for Food Security and Nutrition (2024–2028) and integrating nutrition-sensitive agriculture into Viet Nam's Poverty Reduction National Target Program. WorldFish, in collaboration with the University of Washington, evaluated the cost-effectiveness of integrated nutrition interventions in Bangladesh's aquaculture sector, resulting in guidelines adopted by partners in Bangladesh and Cambodia for scalable, cost-effective interventions.

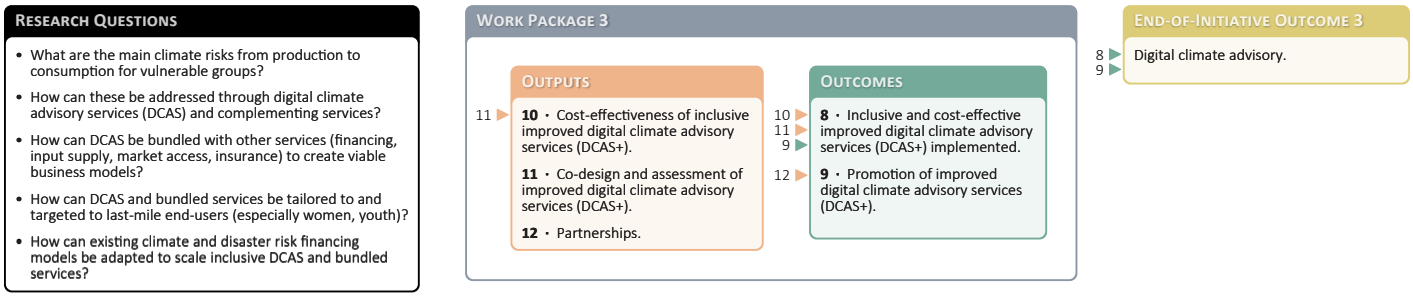
In Bangladesh, WP2 transitioned from data-driven research to large-scale implementation of nutrition-sensitive agrifood systems. Collaborating with the Center for Natural Resource Studies, the project extended IAA technologies to more than 10,000 farmers, covering 1,907 hectares. AMD, in partnership with WorldFish and CIP, improved fish genetics and introduced micronutrient-rich sweet potato varieties. These interventions leveraged private-sector funding, provided training on good aquaculture practices and climate-smart technologies, and trained community health workers to reach rural households with nutrition-sensitive farming practices. The project also contributed to policy dialogues, aligning Bangladesh's agricultural strategy with evidence-based nutrition-sensitive practices.

In Cambodia, WP2 focused on policy integration, data-driven interventions, and institutional capacity building. Collaborating with the Council for Agricultural and Rural Development (CARD), IIRR, and CDRI, the project assessed nutrition-sensitive agrifood systems and developed guidelines for intervention planning. AMD played a key role in Cambodia's Technical Working Group on Food Security and Nutrition, influencing the development of the national strategy. Piloting integrated home-based production models improved food security for 850 households, and consumer awareness campaigns reached more than 5,000 people with nutrition education.

In Viet Nam, WP2 emphasized policy integration, national program alignment, and institutional strengthening. AMD explored the linkage of production and consumption in the Mekong Delta and integrated nutrition-sensitive agriculture into national programs. AMD actively integrated a nutrition-sensitive agrifood systems approach into the Zero Hunger National Action Program, organizing consultation workshops with 23 experts and codeveloping training materials with DCRD. AMD's contributions resulted in government approval of nutrition-sensitive agriculture guidelines, formally integrated into Viet Nam's Poverty Reduction National Target Program. The project facilitated a national expert group, supported the integration of nutrition-sensitive agriculture frameworks into university curricula, and engaged stakeholders through training and consultation workshops. Collaboration with the NIN resulted in a food systems profile for the Mekong River Delta, informing data-driven policymaking.

Through these efforts, WP2 engaged governments, NGOs, and private-sector actors to ensure the sustainability and scalability of nutrition-sensitive practices. Future efforts aim to deepen policy integration, expand farmer outreach, and strengthen regional collaborations to establish climate-resilient, equitable, and nutrition-driven food systems across the Asian mega-deltas.

WP3: De-risking Delta-oriented Value Chains



Work Package 3 progress against the theory of change

WP3 made significant strides in improving climate advisory services for delta-oriented production systems through partnerships and user-centered and value chain climate risk assessments in Viet Nam, Cambodia, Myanmar, and Bangladesh.

In Viet Nam, the WP collaborated with DCP to co-develop and disseminate climate advisory for farmers (rice, fruit) in the Mekong Delta through LTACs. By the end of 2024, ACBs reached 714 communes, benefiting more than 290,000 farmers, including 55,700 (21 percent female) directly through Zalo messenger groups, with financial support from the Ministry of Agriculture. This initiative helped mitigate the impact of climate hazards and adverse weather conditions, boosting crop yields and farmers' income stability. It also changed practices, communication, capacity, interaction, and scaling efforts among government staff and other LTAC members.

A similar approach was implemented in Cambodia, scaling the LTAC model with government support from Battambang and Kampong Speu Provinces to the Lower Mekong Region, reaching 16,508 farmers (69 percent female) with seasonal advisories. Crop decision trees (rice, cassava, maize) underlying advisories for different seasonal forecast scenarios were developed for all provinces, providing a base for agroclimatic advisory at the national level, although financial sustainability remained a concern.

In Myanmar, 26,064 farmers (rice, pulses, fish) in the Irrawaddy Delta benefited from a public-private partnership with Village Link Company Ltd. Using the company's Htwet Toe application for monthly and weekly advisories, farmers saw reduced losses and higher net incomes, demonstrating the cost-effectiveness of climate advisory services with a high return on investment for the digital platform.

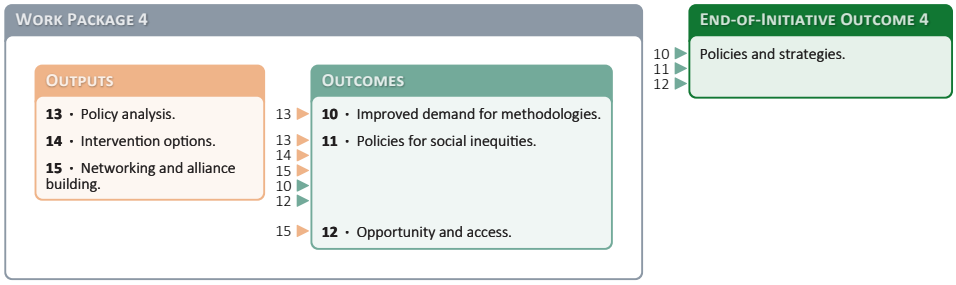
In Bangladesh, the Agvisely digital platform for forecast-based advisory integrated climate-smart practices for 10 crops and reached approximately 500,000 farmers through 8,000 extension officers. Additionally, the Agvisely livestock platform, developed with the Bangladesh Livestock Research Institute, provided tailored weather forecasts for cattle and poultry to mitigate climate impacts. The Interactive Voice Response (IVR) system for mung bean harvest warnings reached 13,826 farmers (8 percent women) across 70 locations, with an estimated service value of US$700,000. Grameen-Euglena, a mung bean export company, paid IVR subscription for 300 farmers, supporting service sustainability.

WP3 successfully built partnerships by linking research with service co-development and stakeholder engagement and training, improving and scaling climate services at national and subnational levels. However, developing sustainable financial models targeting last-mile farmers, particularly women, remained a challenge. Sector and value chain profiling to indicate business viability for novel climate information services and gender and social inclusion assessments inspired by human-centered design offered promising opportunities for further growth.

WP4: Inclusive Deltaic Food-systems Governance

Research Questions

- Can transdisciplinary evidence and improved networking incentivize better alignment of policies, regulatory frameworks, and implementation strategies for natural resources (NR), water, and agriculture?
- Will vertically and horizontally "joined up" governance approaches support more climate-resilient and gender equality and social inclusion–informed NR, water, and agricultural policy outcomes than traditional approaches?
- What entry points do decentralization policies, strategies, and institutions provide for facilitating joined-up governance of NR, water, and agriculture?
- What forms of localized intervention and capacity strengthening will support more GESI and resilient food systems governance?
- What forms of cross-sectoral, decentralized, institutional models and coordination can enhance the efficacy, agency, and inclusiveness of food systems governance coalitions in local contexts?



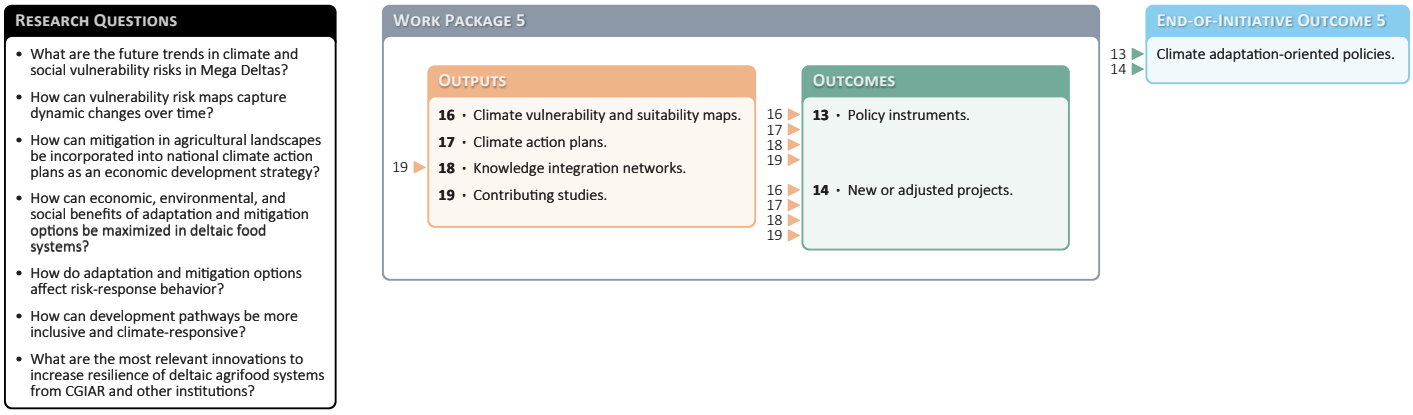
Work Package 4 progress against the theory of change

WP4's research, conducted with local partners in Bangladesh (Oxfam Bangladesh and the Centre for Natural Resources Studies) and Cambodia (CDRI, Inland Fisheries Research Development Institute, and Council for Agricultural and Rural Development), resulted in the following policy/strategy changes:

In Bangladesh, research in the southern coastal deltaic regions produced policy-relevant evidence on the ambiguity and incoherence of policies, which resulted in freshwater grabs and unequal conflicts around freshwater access, impacting agriculture/fish livelihoods of marginalized tenant farmers and women. Following a national policy dialogue workshop in December 2024, attended by high-level delegates, the Bangladesh Agriculture Research Director agreed for the research recommendations to be sent to all Divisional Commissioners for implementation. The AMD team contributed to the drafting of new Bangladesh women's and fisheries policies. AMD partners proposed new approaches to water governance, and co-designed and piloted an Agricultural Water Insecurity Experiences Module and User Guide, and a framework for ethical community engagement toward inclusive agriculture intensification.

In Cambodia, research demonstrated disjointed water management at local (subdistrict) scales between irrigation and inland capture fisheries as a key driver of food insecurity and nutritional losses. Following provincial and national workshops to build stakeholder consensus, AMD piloted two multisector and multiscale DTWGs in the Tonle Sap floodplain and Mekong Delta to facilitate more integrated water management. During the national dialogue in November 2024, His Excellency, the Senior Minister and Chairman of CARD, and other high-level officials recognized the D-TWGs as a valuable innovation aligned with the government's Sub-decree No. 184 of 2019, which seeks more integrated planning at the district level. A policy decision for adopting the D-TWGs nationwide was announced.

WP5: Evidence-based Delta Development Planning



Work Package 5 progress against the theory of change

AMD significantly advanced climate-responsive development in Asian mega-deltas, earning recognition from the Vietnamese government. By fostering strategic data development and engaging stakeholders, the project successfully aligned scientific research with practical policy and project implementation.

A key achievement involved the integration of AMD science into government policy. The implementation of CS-MAP was prioritized in Viet Nam's Green Growth Strategy. Government agencies in Cambodia and Bangladesh praised the CS-MAP Atlas developed under project partnerships and expressed interest in expanding the CS-MAP approach. The CS-MAP Atlas, an extensive, high-resolution crop and aquaculture suitability map, was developed for the Mekong Delta regions of Viet Nam and Cambodia, and the Ganges-Brahmaputra region of Bangladesh. The CS-MAP Atlas offered localized insights into climate risks and alternative adaptation measures and was adopted as a planning tool by local government bodies.

RiceMoRe was institutionalized and scaled to 28 provinces, covering approximately 75 percent of Viet Nam's rice planting area. It was independently nominated for the prestigious National Television Awards, emphasizing AMD activities' contribution to the digital transformation of Viet Nam's agriculture sector. Furthermore, IRRI's innovations (such as greenhouse gas [GHG] calculations and inventory) and technical knowledge on carbon market entry points were adopted in several low-emission projects led by the private sector and development partners.

AMD's work also contributed to climate change mitigation efforts. In Viet Nam, IRRI fostered the establishment of the MRV Task Force for the national 1mHa Program, adjusting RiceMoRe and the Farm-activity Monitoring and Reporting tool (FarMoRe) for efficient activity data monitoring and use in reporting and quantifying GHG emissions from the demonstration sites.

Another significant achievement was the National Institute for Nutrition adding questions related to human mobility and nutrition to Viet Nam's National Nutrition Survey, enriching the data landscape. This was expected to deliver insights into the relationship between migration and nutrition security and was a critical entry point for food systems transformation.

In Bangladesh and Cambodia, community-level evaluations and water management workshops enhanced local capacities. Across the three countries, cost-benefit analyses and adaptive capacity mapping provided data for informed decision-making. Research on human security indexes and climate-induced mobility underpinned targeted climate adaptation action planning that addressed the root causes of vulnerability and promoted the resilience of deltaic communities.

AMD also leveraged knowledge networks, hosting regional knowledge-sharing workshops focused on climate finance and resilient value chains. These events, complemented by publications and field demonstrations, promoted climate-smart practices. The project's impact was amplified through participation in forums such as COP29 in Azerbaijan, the Gobeshona Global Conference, and Agritechnica Asia, which showcased innovations and supported locally led adaptation efforts.

AMD's data and tools played a crucial role in the development of successful funding proposals for climate resilience and low-emission rice production initiatives across Viet Nam, Cambodia, and Bangladesh. This support led to significant funding, including US$48 million from USAID for the Climate Resilient Agriculture in the Mekong Delta project in Viet Nam, US$75 million from GEF for the Promoting Climate Resilient Landscapes project in Cambodia, and US$500 million and US$440 million from the World Bank for low-emission rice production and MRV development in Bangladesh and Viet Nam, respectively.

Work Package progress rating summary

WORK PACKAGE	PROGRESS RATING & RATIONALE
1	On track Overall progress largely aligned with the plan for results, budget, and WP1's theory of change (TOC). Significant progress was made with improved agronomy packages and scalable agribusiness models. Adequate progress was achieved with land suitability mapping. The learning alliance approach proved to be very suitable and successful, but faces scaling challenges unless it is institutionalized and implemented by government partners. WP1 could have had a stronger focus on gender. There was significant evidence that within-Initiative outcomes and EOIOs were achieved, but a comprehensive impact assessment will be needed for confirmation. All research questions were addressed for Viet Nam, Cambodia, and Bangladesh. Work in India started later and was at a smaller scale. Work in Myanmar was not possible due to the security situation.
2	On track WP2 remained on track, aligning with its planned outcomes, budget, and TOC. Substantial progress was made in scaling nutrition-sensitive agrifood systems, strengthening IAA models, and advancing policy frameworks across Bangladesh, Cambodia, and Viet Nam. The Initiative leveraged private-sector funding, integrated cost-effective nutrition interventions, and strengthened institutional capacity through targeted training and policy engagements. WP2 actively supported Cambodia's National Strategy for Food Security and Nutrition (2024–2028) through technical contributions. In Viet Nam, nutrition-sensitive agriculture was formally integrated into the Poverty Reduction National Target Program. Partners across countries, such as icddr,b in Bangladesh and CDRI in Cambodia, adopted a cost-effectiveness framework, developed by the University of Washington's Global Health Department in collaboration with WorldFish and AMD's WP2, for implementing scalable interventions. Research questions were successfully addressed, and gender considerations were integrated, with opportunities to further strengthen gender-transformative approaches.
3	On track WP3 was well on track and in line with TOC. Partnerships were established with public and private-sector actors for the codesign of climate advisory services. Multiple models were codeveloped, tested, evaluated, and improved. Rigorous studies were employed to collect evidence on cost-effectiveness of climate services. Several models were implemented, promoted, and scaled with government and private-sector partners. Developing sustainable business/financial models for last-mile farmers, including women, remained challenging. However, research and tools developed in AMD offer promising avenues for further exploration.
4	On track WP4 demonstrated significant policy influence and impact across Bangladesh, Cambodia, and Viet Nam. In Bangladesh, WP4's research directly addressed critical issues of freshwater access and policy incoherence, with recommendations being taken up for implementation and contributions made to key policy documents. In Cambodia, WP4's work on disjointed water management led to the piloting and nationwide adoption of D-TWGs, a substantial policy change. These outcomes indicate that WP4 effectively translated research into policy and practice, demonstrating strong alignment with its objectives and a high degree of success.
5	On track WP5 was highly successful; its activities adhered to the developed plan and TOC, with adjustments made based on country needs. This work generated clear evidence for the effective implementation of adaptive actions, with innovations and knowledge informing policy development and finance for dual adaptation and mitigation outcomes. For example, the site-specific risk evaluation obtained from the CS-MAP recommended interventions that triggered a substantial shift in the adaptive cropping system in the Mekong River Delta (MRD) of Viet Nam. This achievement was then used as a reference for developing the national Green Growth Strategy.

Definitions

On track

- Progress largely aligns with Plan of Results and Budget and Work Package theory of change.
- Can include small deviations/issues/delays/risks that do not jeopardize success of Work Package.

Delayed

- Progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas.
- Deviations/issues/delays/risks could jeopardize success of Work Package if not managed appropriately.

Off track

- Progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas.
- Deviations/issues/delays/risks do jeopardize success of Work Package.

Section 4: **Quantitative overview of key results**

This section provides an overview of results reported and contributed to, by the CGIAR Initiative on Asian Mega-Deltas from 2022 to 2024. These results align with the CGIAR Results Framework and Asian Mega-Deltas's theory of change. Further information on these results is available through the CGIAR Results Dashboard.

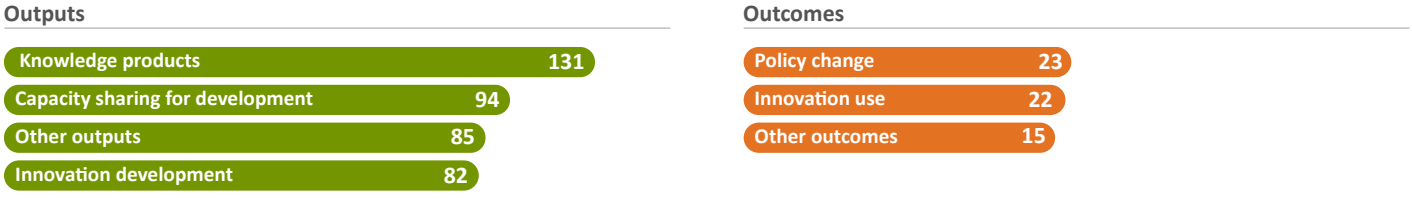
The data used to create the graphics in this section were sourced from the CGIAR Results Dashboard on 04 April 2025. These results are accurate as of this date and may differ from information in previous Technical Reports. Such differences may be due to data updates throughout the reporting year, revisions to previously reported results, or updates to the theory of change.

Overview of results by category

Cumulative Overview (2022-2024)

Overview of results by category YoY

2024

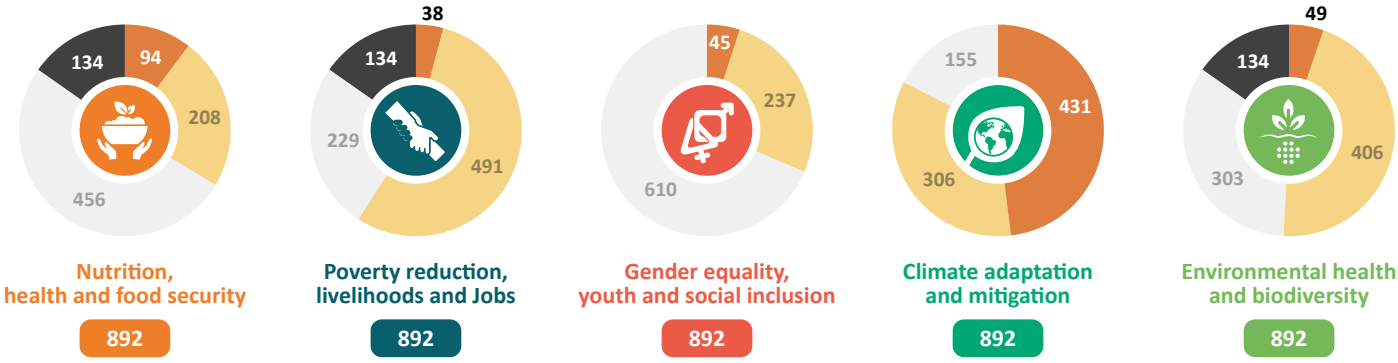


2023

2022

The YoY graphs reflect newly reported results each year, as well as updates to results from previous years. AMD produced substantial outputs, including capacity sharing, innovation development, and knowledge products, which led to outcomes such as innovation use and policy changes. Overall, AMD generated a significant number of results, demonstrating its impact in the region. The results show a clear upward trend from 2022 to 2024, indicating increasing output and outcomes year over year, particularly in capacity sharing, knowledge products, and innovation use.

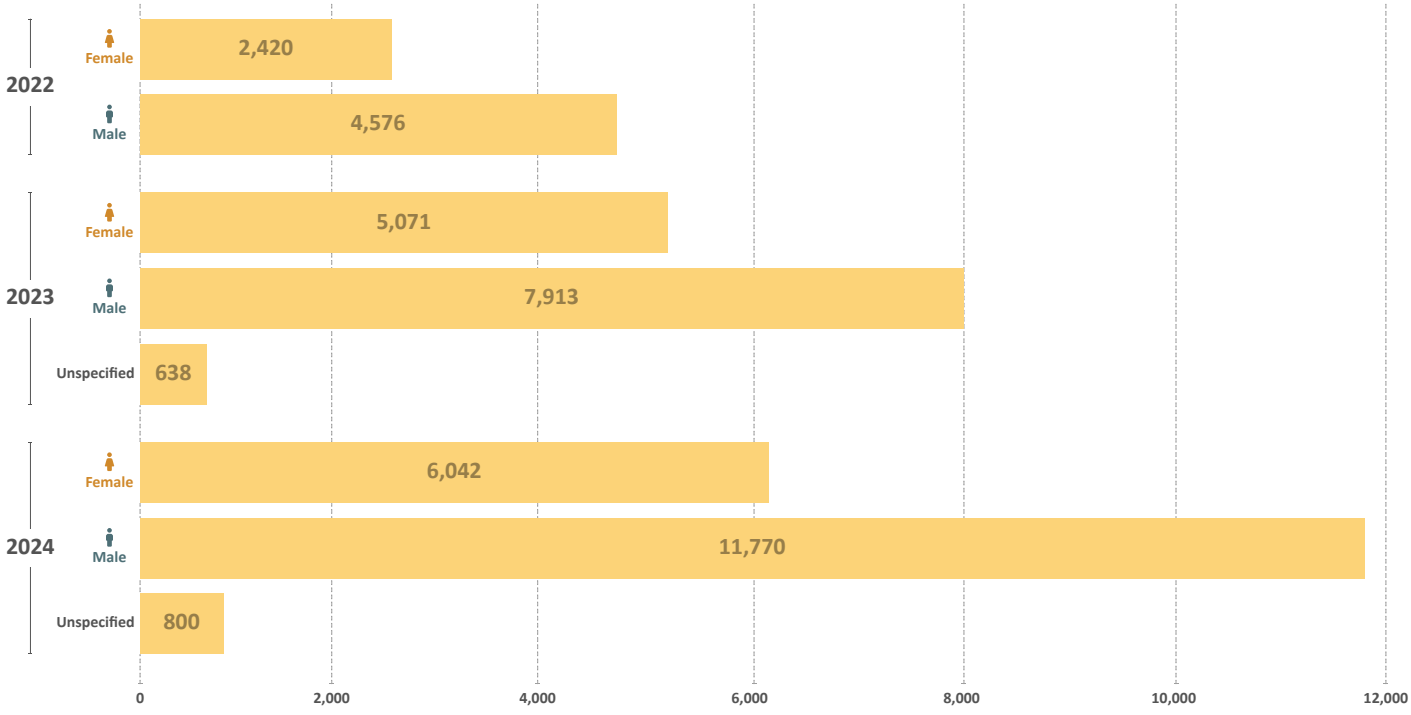
Number of results by Impact Area contribution



- **2 = Principal:** Contributing to one or more aspects of the Impact Area is the principal objective of the result. The Impact Area is fundamental to the design of the activity leading to the result; the activity would not have been undertaken without this objective.
- **1 = Significant:** The result directly contributes to one or more aspects of the Impact Area. However, contributing to the Impact Area is not the principal objective of the result.
- **0 = Not targeted:** The result has been screened against the Impact Area, but it has not been found to directly contribute to any aspect of the Impact Area as it is outlined in the CGIAR 2030 Research and Innovation strategy.
- **Not applicable:** Pertains to 2022 reported results when only information on Gender and Climate impact area tagging was available.

AMD had a strong focus on climate change adaptation and mitigation, with many results tagged as significant or principal. AMD demonstrated wide-ranging impact across multiple CGIAR Impact Areas, with varying levels of emphasis.

Number of individuals trained by the initiative

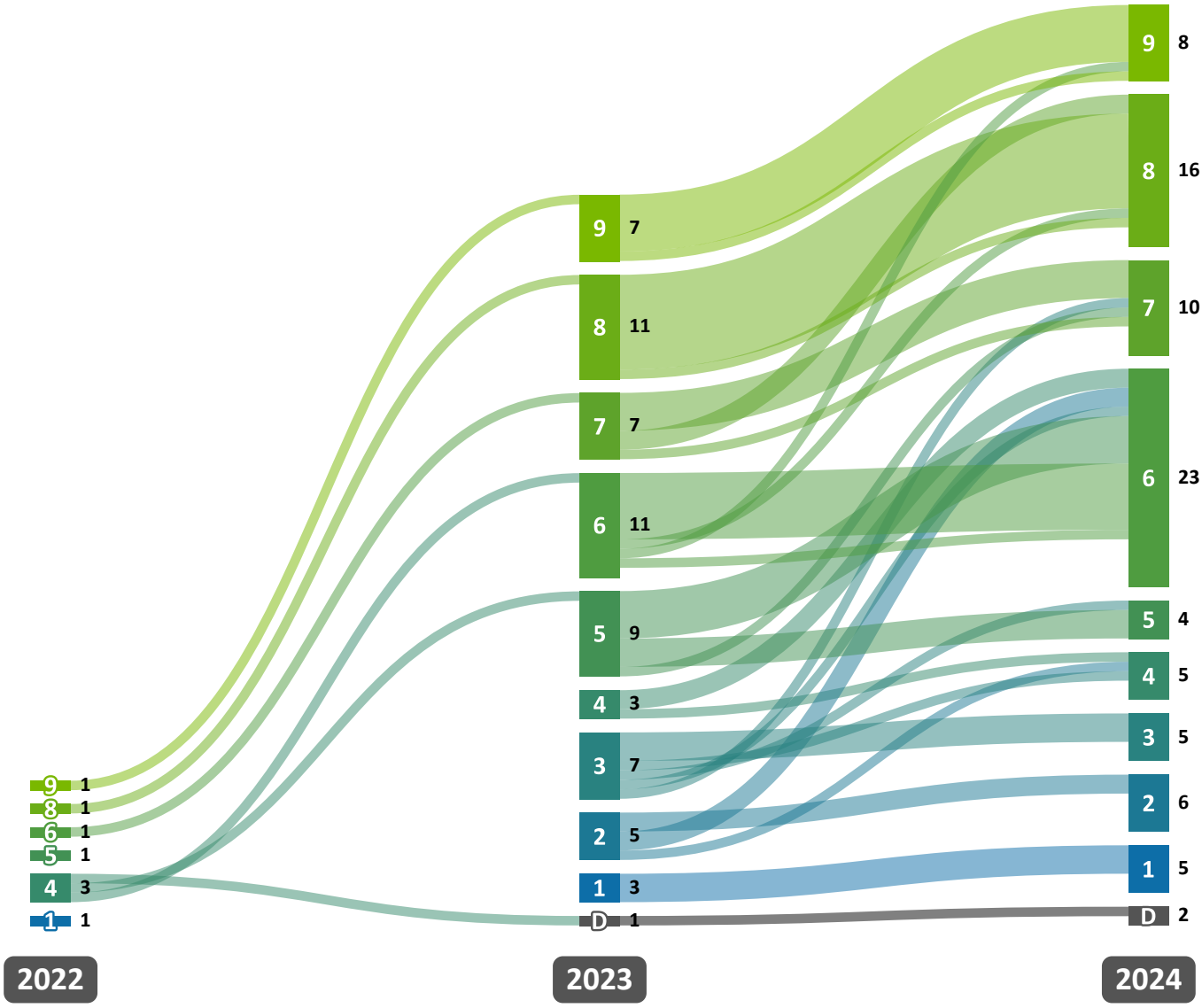


From 2022 to 2024, the number of individuals trained through AMD's short-term training clearly trended upward. The number of trainees rose from 6,996 in 2022 to 18,612 in 2024, indicating a substantial expansion of the Initiative's training efforts.

Number of innovations and their readiness levels

		Pipeline overview # of innovations
9	**Proven Innovation** The innovation is validated for its ability to achieve a specific impact under uncontrolled conditions	8
8	**Uncontrolled Testing** The innovation is being tested for its ability to achieve a specific impact under uncontrolled conditions	16
7	**Prototype** The innovation is validated for its ability to achieve a specific impact under semi-controlled conditions	10
6	**Semi-Controlled Testing** The innovation is being tested for its ability to achieve a specific impact under semi-controlled conditions	24
5	**Model/Early Prototype** The innovation is validated for its ability to achieve a specific impact under fully-controlled conditions	5
4	**Controlled Testing** The innovation is being tested for its ability to achieve a specific impact under fully-controlled conditions	6
3	**Proof of Concept** The innovation's key concepts have been validated for their ability to achieve a specific impact	5
2	**Formulation** The innovation's key concepts are being formulated or designed	6
1	**Basic Research** The innovation's basic principles are being researched for their ability to achieve a specific impact	5
0	**Idea** The innovation is at idea stage	0

Innovation readiness trend (2022 - 2024)

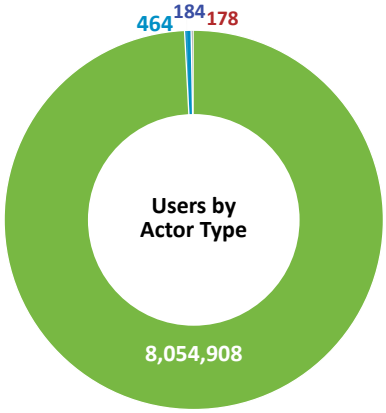


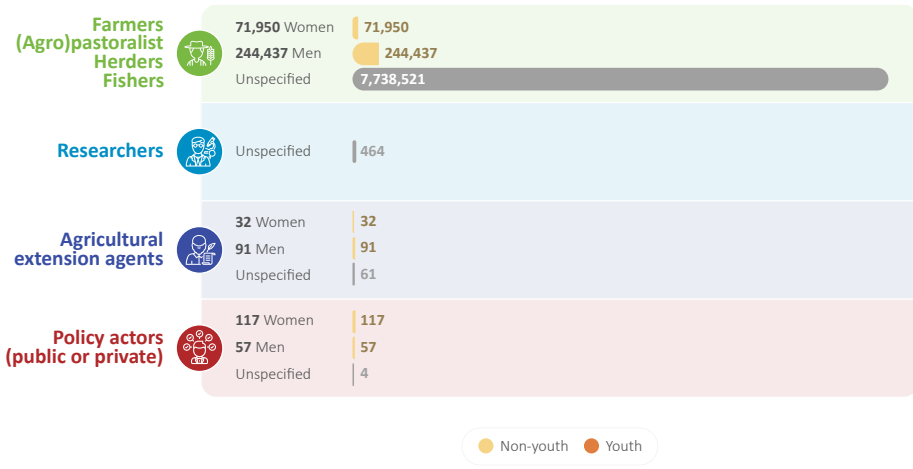
9 Proven Innovation • 8 Uncontrolled Testing • 7 Prototype • 6 Semi-Controlled Testing • 5 Model/Early Prototype • 4 Controlled Testing • 3 Proof of Concept • 2 Formulation • 1 Basic Research • 0 Idea • D Discontinued

Most of AMD's innovations were in the mid-to-late stages of development, with a significant number in the semi-controlled testing or prototype phases, and a notable name already in the proven phase. Overall, the pipeline indicates the progression of innovations toward maturity and impact.

Field demonstration showcasing innovations under Viet Nam's 1 Million Hectares Program. Credit: IRRI

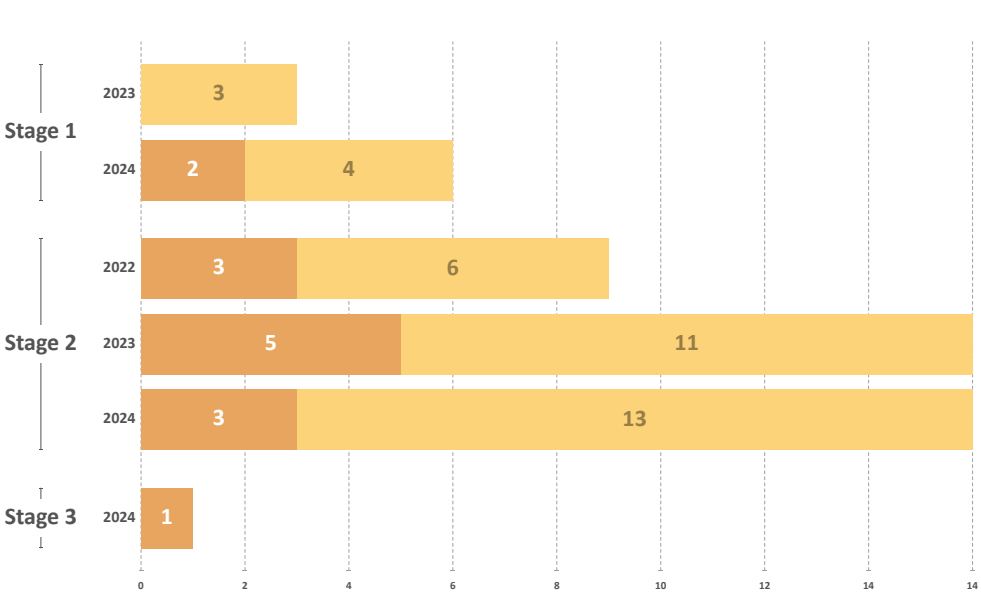
Innovation users by type of actors





AMD had the highest engagement of innovation users among farmers/(agro)pastoralists, totaling more than 8 million, which indicates a strong focus on on-the-ground adoption of innovations.

Policies by stage and by type



STAGE 1
Research taken up by next user, policy change not yet enacted.

STAGE 2
Policy enacted.

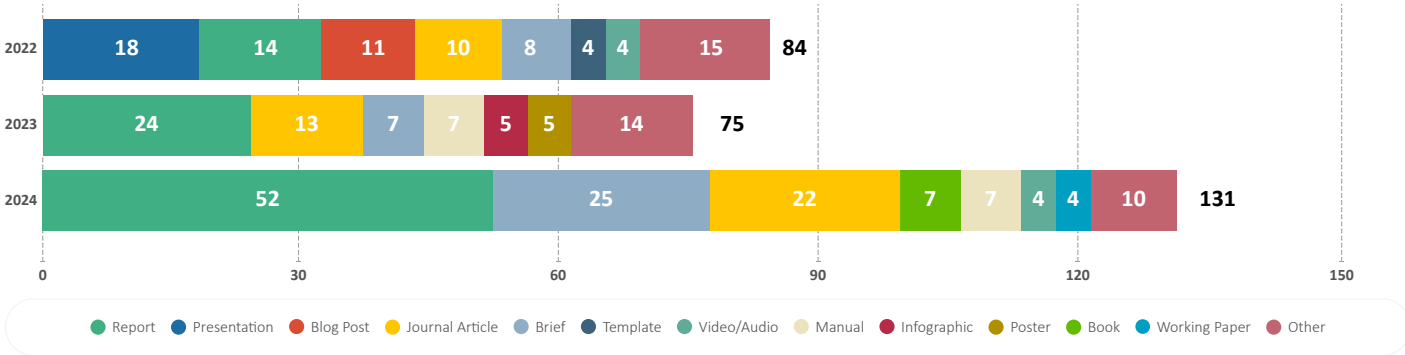
STAGE 3
Evidence of impact of policy.

POLICY OR STRATEGY
Policies or strategies include written decisions on, or commitments to, a particular course of action by an institution (policy); or a (government, NGO, private sector) high-level plan outlining how a particular course of action will be carried out (strategy). These documents show the intent of an organization or entity. Examples are country growth strategies, country agricultural policies, organization strategic plans or road maps. This could also be observed as information campaigns (e.g., for improved diets). These documents set the goalposts but then require other instruments for implementation.

PROGRAM, BUDGET OR INVESTMENT
These are implementing mechanisms that often follow from a strategy, policy or law. There is typically a well-defined set of actions outlined over a specific period of time and with a specific budgetary amount attached. National Agricultural Investment Plans is an example, the budget within a ministry is another, investments from the private sector fit here, as well as programs launched by public, private and NGO sectors.

AMD progressively achieved policy outcomes, with the majority of these outcomes related to policy or strategy. The Initiative demonstrated increasing success from Stage 1 to Stage 2, with Stage 2 (policy enacted) demonstrating the highest number of policy outcomes.

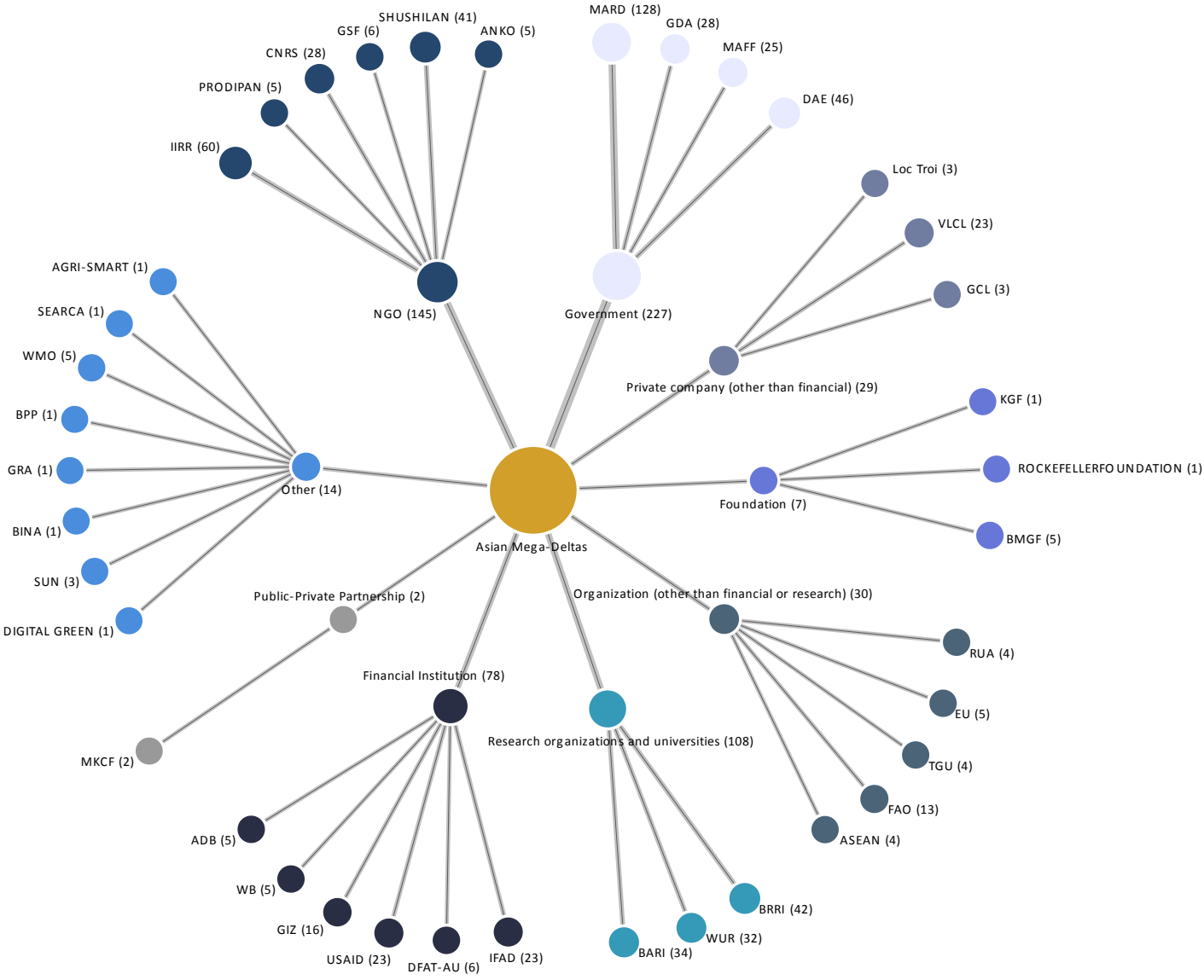
Knowledge products by type



AMD produced a variety of knowledge products, with a shift in emphasis over time.

Demonstration of combined harvester in the pilot field of Viet Nam's 1 Million Hectares Program in the Mekong Delta.
Credit: IRRI

Asian Mega-Deltas's external partners



The diagram maps the external partners of Asian Mega-Deltas Initiative, organized by partner type. The numbers in brackets represent the number of results each partner has contributed to, reflecting the scale and diversity of collaborations. To allow for a clearer view, a maximum threshold of five partners was applied for each typology. The list of partner acronyms is available here.

Partnerships and Asian Mega-Deltas's impact pathways

AMD operated through a comprehensive network, engaging with nearly 200 diverse partners across its operational countries. This vast network encompassed national government agencies, prominent research institutes, esteemed academic institutions, influential international organizations, and key funding agencies. In Viet Nam, AMD forged a particularly strong collaborative relationship with MARD and its affiliated agencies. This collaboration proved instrumental in the successful implementation of a wide array of AMD activities, resulting in significant achievements in both policy and investment outcomes. Among the various MARD agencies, DCP stood out as AMD's most frequent and significant collaborator. Their joint efforts spanned a broad spectrum of activities, ranging from the development and implementation of the ambitious 1mHa Program to the scaling of mDSR and the promotion of a rice straw-based circular economy. This also included the development and scaling of ACBs and the deployment of the innovative RiceMoRe system within MRD. Expanding beyond the DCP, AMD also worked closely with the Institute of Policy and Strategy for Agriculture and Rural Development, DCRD, Center for Agriculture Digital Transformation and Statistics, and various local Departments of Agriculture and Rural Development. Moreover, AMD extended its collaborative reach to agencies outside of MARD, such as NIN, which operated under the Ministry of Health, demonstrating a holistic approach to addressing multifaceted food systems and nutrition challenges.

In Bangladesh, AMD's collaborative efforts extended to a wide range of pivotal government agencies. These included the Department of Agriculture Extension, Bangladesh Agricultural Research Institute, Bangladesh Water Development Board, Bangladesh Rice Research Institute, Bangladesh Agricultural Development Corporation, Bangladesh Meteorological Department, and Institute of Water Modeling. Similarly, in Cambodia, AMD established robust

partnerships with key national agencies, such as the General Directorate of Agriculture within the Ministry of Agriculture, Forestry, and Fisheries , Inland Fisheries Research and Development Institute, Fisheries Administration, and various Provincial Departments of Agriculture, Forestry, and Fisheries. Furthermore, in India, specifically within the West Bengal region, AMD actively engaged with government institutes such as the Central Soil Salinity Research Institute, addressing critical regional challenges.

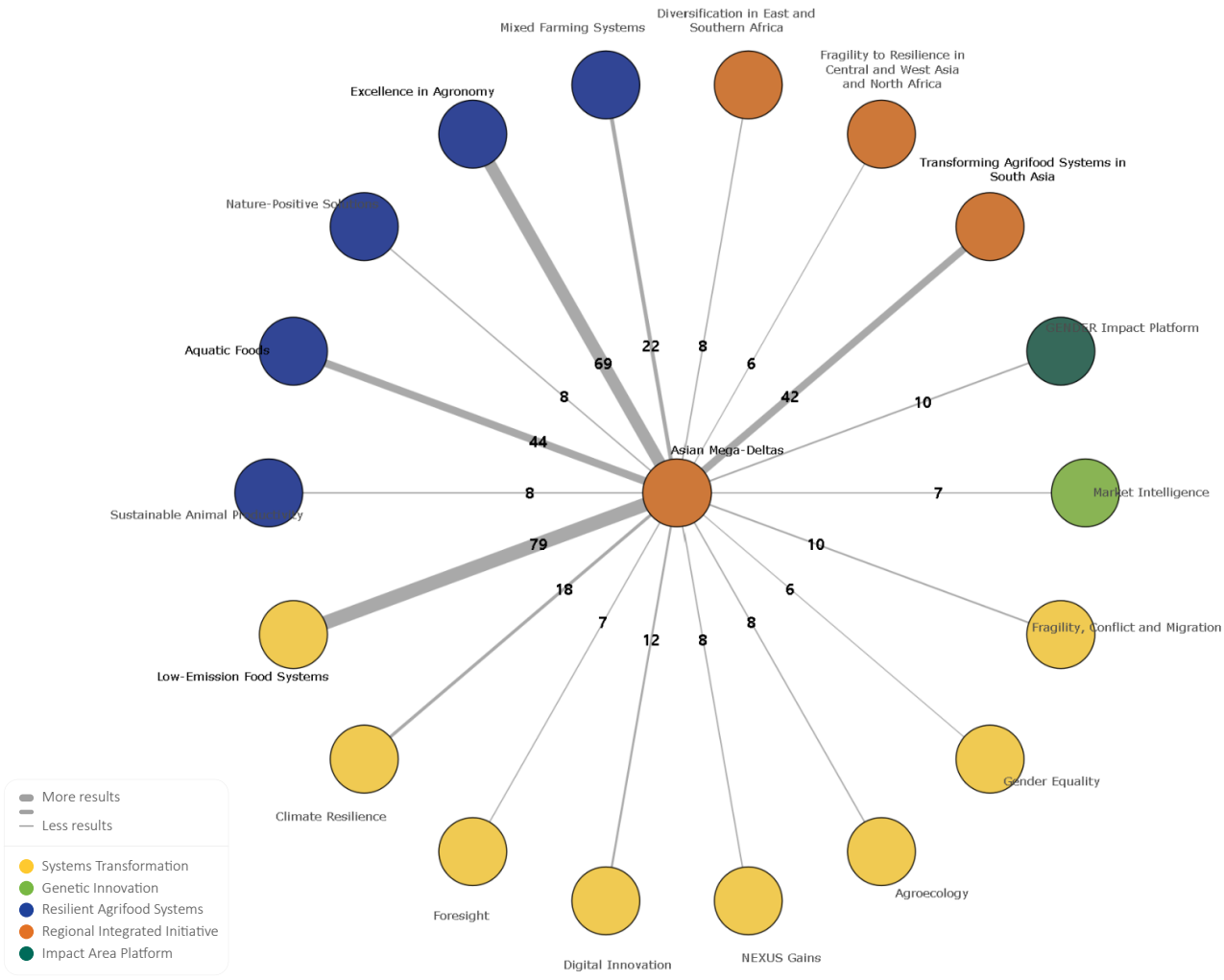
AMD also strategically cultivated partnerships with a multitude of international NGOs and research institutions to bolster its initiatives in both Bangladesh and Cambodia. In Bangladesh, these collaborations included organizations such as Shushilan and the Center for Natural Resources Studies, leveraging their expertise in local development and natural resource management. In Cambodia, AMD formed significant partnerships with institutions such as the International Institute of Rural Reconstruction, CDRI, and Cambodian Agricultural Research and Development Institute, fostering a collaborative environment for research and development. Additionally, AMD actively engaged in research activities with esteemed academic partners, including Wageningen University and Research Centre, Can Tho University in Viet Nam, Royal University of Phnom Penh and Royal University of Agriculture in Cambodia, and Bangladesh Agricultural University, ensuring the integration of cutting-edge scientific knowledge into its initiatives. Private-sector engagement was also a crucial aspect of AMD's endeavors, with partnerships established with companies such as Village Link Company Limited in Myanmar and Binh Dien Fertilizer Joint Stock Company in Viet Nam. Partnerships with start-up companies in Cambodia were also established.

At the regional level, AMD collaborated with various organizations, including the FAO Regional Office for Asia and the Pacific, Association of Southeast Asian Nations, and Southeast Asian Regional Center for Graduate Study and Research in Agriculture, among others. AMD activities linked to bilateral projects received financial support from institutions such as the International Fund for Agricultural Development, USAID, German Agency for International Cooperation, Mekong-Republic of Korea Cooperation, Australian Government's Business Partnerships Platform, Gates Foundation, and Rockefeller Foundation.

These partnerships underscore AMD's commitment to a diverse and comprehensive collaborative approach, driving innovation and advancing agricultural and development initiatives across the region

AMD worked with local stakeholders to implement integrated food systems governance in the Cambodian Mekong Delta.
Credit: WorldFish

Asian Mega-Deltas's internal network of collaborations



The diagram presents the internal collaborations of Asian Mega-Deltas Initiative with other CGIAR Initiatives, Impact Area Platforms. Connections are sized according to the number of shared reported results, highlighting the depth of collaboration across the CGIAR Portfolio. A results threshold filter is applied (set to a minimum of six results) to focus the view on the most significant collaborations. Thicker lines represent stronger collaborative links based on a higher number of shared results.

Portfolio linkages and Asian Mega-Deltas's impact pathways

Acting as a pivotal RII, AMD served as a central platform for harmonizing the efforts of diverse CGIAR Initiatives operating across South and Southeast Asia.

In Bangladesh, AMD actively engaged with numerous Initiatives to promote agricultural practices and address climate-related challenges within the vulnerable delta regions. Working closely with Aquatic Foods, AMD improved aquaculture production by enhancing extension delivery through private local service providers and facilitating farmer access to improved G3 rohu fish. Excellence in Agronomy and AMD evaluated the risks associated with different agronomic climate adaptation strategies, specifically focusing on rice planting strategies in the Indo-Gangetic Plains. Additionally, through a partnership with the Mixed Farming Systems, AMD examined the gender dimensions of floating agriculture and studied the effectiveness and adoption determinants of Sorjan farming as a climate-smart practice, while also working to develop and scale resilient cropping systems in sensitive coastal regions. Moreover, in collaboration with Fragility, Conflict, and Migration, AMD examined the interconnected themes of climate, food security, and conflict, including community perceptions of climate events as security issues and the relationship between climate change and migration decisions. In partnership with Transforming Agrifood Systems in South Asia, AMD studied the conditioning factors and decision space related to hard and soft climate-smart investments in aquaculture and developed and implemented an IVR service to provide timely harvest warnings to mung bean farmers, enhancing regional agricultural outcomes.

In Cambodia, Aquatic Foods worked with AMD on enhancing food security and nutrition through integrated approaches, analyzing water security, improving food system governance, and promoting innovative models and dialogues for decentralized governance. Plant Health spearheaded a diversification experiment focusing on rice-watermelon systems; through joint efforts with AMD, participatory learning activities were conducted to ensure that both male and female farmers could effectively observe and learn from the experimental processes. Collaboratively, AMD and Excellence in Agronomy produced training videos on MDSR for Cambodian stakeholders and farmers, and promoted diversified farming systems through rice-sweet potato production. Both Initiatives also drove the scaling of mDSR within the Mekong Delta, encompassing both

Cambodia and Viet Nam. This effort aimed to minimize input usage, reduce carbon footprint, and enhance seeding precision, seedling vigor, and overall yield compared to traditional rice cultivation methods.

In Viet Nam, AMD collaborated extensively with Excellence in Agronomy to contribute to the development of MARD's ambitious 1mHa Program, producing and launching technical guidelines and manuals on high-quality and low-emission rice production in the MRD, and organizing events to promote their adoption, along with rice straw-based circular economy practices and mechanized rice farming. Furthermore, AMD conducted collaborative research with Climate Resilience, examining farmers' conflict and cooperation behaviors concerning land use transitions within rice-shrimp systems in the MRD. Additionally, AMD worked with Low-Emission Food Systems on the development and promotion of RiceMoRe and FarMoRe, digital tools for monitoring and reporting rice farming activities, and on conducting extensive training sessions across Viet Nam for various stakeholders, including government officers, extension agents, private-sector representatives, and farmers, to facilitate their adoption and effective use.

Other collaborations in Viet Nam included work with Climate Resilience and Fragility, Conflict, and Migration on studies and training that explored the relationship between human mobility and food and nutrition security in MRD, as well as with the CGIAR Research Initiative on Sustainable Healthy Diets on developing and piloting training materials and guidelines in Vietnamese on nutrition-sensitive agrifood systems for provincial and district staff in the Mekong Delta, Viet Nam.

At the regional level, AMD collaborated with Low-Emission Food Systems on co-organizing workshops in Cambodia and Thailand in 2024 to promote climate finance, resilient agrifood systems, and investment mobilization through carbon markets in the Asia-Pacific region. Another collaboration with Digital Innovation involved a workshop aimed to assess, develop, and scale various digital tools (including farm management tools, GHG calculators, and RiceMoRe) for farmers and cooperatives, addressing challenges, scaling readiness, funding, and institutional protocols.

The Fragility, Conflict, and Migration Initiative and AMD examined the relationship between climate change and migration decisions.
Credit: ABC

Section 7: **Key result story**

Mainstreaming CGIAR innovations in Asian Mega-Deltas

CGIAR innovations are being integrated into climate change and food system policies by governments in Asian Mega-Delta regions.

Rice straw mushroom cultivation is part of the Innovation Package under Viet Nam's 1 Million Hectare Program. Credit: IRRI

Primary Impact Area

Other relevant Impact Areas targeted

Contributing Initiative

Excellence in Agronomy · Low Emission Food Systems · Sustainable Healthy Diets · Aquatic Foods

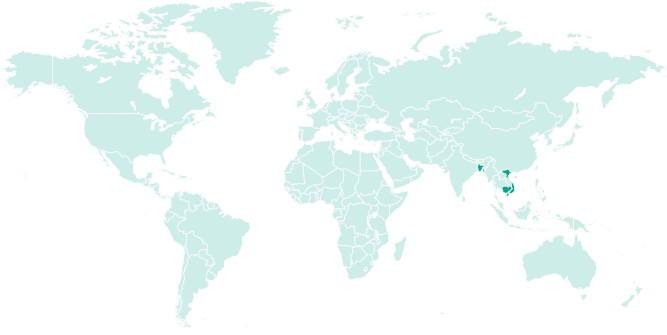
Contributing Centers

IRRI · IWMI · Alliance of Bioversity and CIAT · WorldFish

Contributing external partners

Department of Crop Production, MARD · Department of Cooperatives and Rural Development, MARD · Department of Agriculture and Rural Development (DARD) in MRD · General Department of Agriculture

Geographic scope



Regions: South Asia · Southeast Asia

Countries: Bangladesh · Cambodia · Viet Nam

Countries in Asian mega-delta regions, such as Bangladesh, Cambodia, and Viet Nam, are highly vulnerable to climate change. To ensure food and nutrition security, they must intensify their efforts in climate adaptation and mitigation, particularly within their food systems. To support these efforts, several of AMD's innovations—such as agroclimatic bulletins, alternate wetting and drying, climate-smart mapping and adaptation planning, a decentralized food system governance approach, the rice straw-based circular economy, and RiceMoRe—are being mainstreamed into national and subnational policies and programs, including Nationally Determined Contributions, the National Strategy on Green Growth, the 1mHa Program, the Poverty Reduction National Target Program, and Zero Hunger.

Asian mega-deltas support a large population and are vital for regional food systems, but they are nearing a critical point due to escalating threats to food and nutrition security. Climate change is a significant driver, causing increased floods, sea-level rise, and salinization, and potentially leading to substantial economic losses and increased poverty. In response to these challenges, countries in the region have updated their Nationally Determined Contributions to pursue more ambitious mitigation goals and are prioritizing programs to enhance adaptation and resilience. These nations are also focusing on policies to safeguard food and nutrition security.

In 2023, Viet Nam launched the 1mHa program to adapt its rice sector to climate change, reduce greenhouse gas emissions, and meet its international climate goals, including achieving net-zero emissions by 2050. AMD has played a vital role in supporting this program by providing technical expertise, promoting knowledge exchange, and demonstrating innovative practices. The 1mHa program will utilize AMD innovations such as alternate wetting and drying (AWD), mechanized direct-seeded rice (mDSR), and climate-smart mapping and adaptation planning (CS-MAP). The Vietnamese government has directed collaboration between subnational departments and the International Rice Research Institute (IRRI) and issued policies to scale up AMD innovations, specifically integrating IRRI's rice straw-based circular economy and mDSR approaches into national guidelines.

AMD's involvement also led to the institutionalization of the Rice Monitoring and Reporting System by the Ministry of Agriculture and Rural Development (MARD) in the Mekong River Delta (MRD) region. The RiceMoRe tool, developed by the AMD Initiative, was officially transferred to MARD for broad implementation, with MARD requesting ongoing technical support from IRRI. IRRI also contributed to the development of monitoring, reporting, and verification (MRV) systems for Viet Nam's 1mHa Program. The Vietnamese government has sought IRRI's expertise to expand these MRV pilot models.

The integration of AMD innovations into policy frameworks was exemplified by the inclusion of AWD in Viet Nam's updated NDC. AWD, an irrigation technique developed by IRRI, was formally listed as a key measure for reducing methane emissions from agriculture.

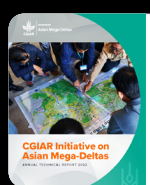
CS-MAP, developed by IRRI and Viet Nam's Department of Crop Production to promote evidence-based delta development planning under AMD, was integrated into MARD Decision No. 3444 on the Action Plan to implement the National Strategy on Green Growth 2021–2030. Implemented effectively in five agroecological regions of Viet Nam, including the MRD region, AMD scaled CS-MAP to Cambodia and Bangladesh. In collaboration with the General Department of Agriculture, AMD supported local policymakers in piloting climate-smart risk adaptation measures in the Cambodian Mekong Delta provinces using CS-MAP. In Bangladesh, AMD worked with the Bangladesh Water Development Board, the Bangladesh Rice Research Institute, the Bangladesh Agricultural Research Institute, the Department of Agricultural Extension (DAE), and the Bangladesh Agricultural Development Corporation to implement CS-MAP in 10 districts of the coastal region and provided the maps to Deputy Directors of DAE at a launch event.

Moreover, agroclimatic bulletins (ACBs), developed to provide agricultural advisories based on climate and weather forecasts, were integrated into the 2024 work plans of the Department of Agriculture and Rural Development in MRD, with MARD directing continued implementation across the region. ACBs were scaled to 714 communes in 71 districts, reaching more than 290,000 farmers through various media, with financial support from MARD. Recognizing ACBs as a valuable technical advancement, MARD supported their wider implementation, leading to the establishment of a regional working group and the allocation of budgets for further scaling and piloting of ACBs in other provinces.

AMD also played a key role in shaping food systems and nutrition policies in Viet Nam and Cambodia. In Viet Nam, MARD's Department of Cooperatives and Rural Development acknowledged AMD's technical support in the development of the National Action Plan on Zero Hunger and included AMD scientists in their expert group. AMD representatives also participated in the technical working group for the National Action Plan on food systems transformation. Furthermore, the guidelines for nutrition-sensitive agrifood systems, co-developed by AMD, were integrated into Viet Nam's Poverty Reduction National Target Program. AMD's research also influenced food security and nutrition strategies in Cambodia, shaping the Third National Strategy for Food Security and Nutrition for 2024–2028 and the Food System for Sustainable Development 2030 Roadmap. These policies in both countries prioritize enhanced food security, nutrition, and health, and emphasize sector-led responsibilities and multisectoral collaboration.

AMD also promoted decentralized food system governance. District-level technical working groups in Cambodia are integrating AMD's decentralized food system governance approach into their water resources management plans for Boeng Sneh Lake and Boeng Ream Community Fish Refuge, and the Fisheries Administration of Cambodia committed to scaling this approach with support from the International Water Management Institute and World Fish. Additionally, AMD's research informed the priorities of Bangladesh's Department of Fisheries, which committed to supporting actionable pathways toward sustainable and inclusive canal water management in coastal Bangladesh

> The Asian Mega-Deltas (AMD) Initiative integrates vital CGIAR innovations into our agriculture. AMD coordinates and consolidates CGIAR Centers' support for MARD, and provides technical assistance for capacity building and implementation, especially for the One Million Hectares Program and food systems transformation. It's a key partnership for Viet Nam's resilient agricultural future.
>
> Dr. Nguyen Do Anh Tuan, Director General of the International Cooperation Department, Ministry of Agriculture and Rural Development



2022 key result story

Scaling AMD Innovations in the Mekong Delta

2023 key result story

Viet Nam government is scaling Asian Mega-Deltas innovations to support Mekong River Delta development

CGIAR

INITIATIVE ON

Asian Mega-Deltas

Collaborative research to develop measurement, reporting, and verification of greenhouse gas emissions and mitigation in agriculture was conducted by the Low Emission Food Systems Initiative and AMD.

Credit: IRRI