SCALING SMART VALLEYS APPROACH FOR LAND AND WATER MANAGEMENT: INSIGHTS AND LESSONS LEARNED FROM 2022 TO 2025

Training Workshop Report

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Titles in this series aim to disseminate interim research on the scaling of climate services and climate-smart agriculture in Africa, in order to stimulate feedback from the scientific community.

Photos

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ABSTRACT

Rice production is rapidly increasing in Mali. However, population growth continues to outpace rice production, raising concerns about whether Mali can reach its goal of rice self-sufficiency. Additionally, rice production systems in Mali are vulnerable to the combined effects of recurring extreme weather events and the lack of co-designed relevant adaptation strategies. Without proper climate-smart agricultural (CSA) strategies, considerable yield declines have been reported in rice fields, with projections indicating that these declines may worsen in inland rice production systems. Hence, there is a need to continuously promote the widespread access and use of context-specific CSA innovations, such as the Smart Valleys' approaches to inland water management, which is key to enhanced rice productivity. Since 2022, the AICCRA Mali project has been promoting the dissemination of various CSA innovations in rice-based systems in Mali, particularly by engaging local partners who directly provide capacity-building and agro-advisory services to farmers. Between 2022 and 2025, 54 Smart Valleys have been developed in rice production systems in Mali, supporting the rice production activities of over 4500 rice farmers, about 84% of whom are female. The main objective of this workshop is to enhance and strengthen the capacity of different actors engaged in rice value chains on site selection, development, and post-development maintenance of Smart Valleys in inland rice production systems. The workshop also identified various constraints faced in adopting the Smart Valleys approach to water management. To ensure the ongoing expansion of the AICCRA initiative, key lessons and insights from implementing the AICCRA project between 2022 and 2025 were highlighted by workshop participants, which are essential for promoting sustained scaling of Smart Valleys in Mali.

This report summarizes the outcomes of a one-day AICCRA Mali training workshop, held on 18 November 2025 in Bamako, focusing on the scaling of the Smart Valleys approach for land and water management. The workshop was attended by 22 participants, with 35% being women. Facilitated by AfricaRice, the session brought together extension agents, local authorities, researchers, NGOs, and farmer representatives to strengthen participants' capacity and skills in inland Smart Valleys development and climate-smart rice production. Through five interactive modules, participants explored the ecological foundations of lowlands, criteria for selecting suitable sites, participatory techniques for developing bunds and drainage systems, and essential practices for maintaining structures and improving soil fertility. Lively exchanges between the trainer and participants enriched the training, allowing field-based questions to clarify technical principles and contextualize lessons learned from Smart Valleys implementation in Mali between 2022 and 2025.

The workshop highlighted both the strong adoption potential of the approach and the key constraints facing communities, including labour demands, technical capacity gaps, limited access to tools and materials, irregular rainfall, and the need for consistent maintenance. Insights from four years of implementation of Smart Valleys underscored the importance of community ownership, accurate technical execution, sustained mentoring, and the integration of Smart Valleys into local development plans as critical drivers of long-term success and ownership. Overall, the session strengthened participants' ability to

design, manage, and scale Smart Valleys interventions, offering a clear pathway for expanding climate-resilient land and water management practices across Mali as the AICCRA project progresses.

Keywords
Climate change; Climate smart agriculture; Smart Valleys; Capacity-building; Adoption; Scaling; Mali

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INTRODUCTION

Background information

Mali lies in the central Sahel, a region already experiencing rapid warming, growing inter-annual rainfall variability, and an increase in extreme weather events (heatwaves, intense floods, intense storms, and episodic droughts). These directional changes are well documented in the recent IPCC assessment and regional syntheses, which highlighted that mean temperatures in the Sahel have risen substantially in recent decades, heat extremes are becoming more frequent and severe, and the rainfall pattern is characterized by higher variability and shifting seasonality, all of which reduce the reliability of rain-fed agriculture and increase exposure to climate risk (IPCC, 2022). Such climatic shifts amplify the risks of both agricultural drought and episodic flooding, intensify land degradation, and heighten the vulnerability of smallholder rice farmers' livelihoods across Mali.

Rice is a rapidly expanding staple in Mali, but rice production systems, especially rain-fed lowlands and smallholder irrigated farms, are sensitive to the combined effects of higher temperatures, erratic rainfall, and water-management constraints. Without proper climate adaptation strategies, substantial decreases in rice yield have been reported in irrigated and dry-season rice production systems in Mali, while yield outcomes for rain-fed systems vary with changes in water availability and management (van Oort & Zwart, 2018). Given that rice production in Mali is affected by climate change and the population continues to rely heavily on rain-fed agriculture, it is important to promote system-specific climate-smart irrigation management and improved water control approaches to reduce projected yield losses.

The literature on Climate-Smart Agriculture (CSA) emphasizes three complementary objectives: increasing productivity, strengthening resilience, and reducing greenhouse-gas emissions where feasible, and identifies a portfolio of climate-smart interventions suitable for semi-arid and lowland contexts (Lipper et al., 2014). Proven smart-strategies include improved water management (e.g., Smart Valleys, alternate wetting and drying, controlled drainage, and small-scale irrigation), the introduction of drought-tolerant and early-maturing varieties, integrated soil-fertility management, and the use of climate information services to inform the timing of agricultural activities and the type of inputs to use (Defoer et al., 2017). Evidence also underscores that the adoption of CSA depends critically on local adaptation of technologies, farmer participation in design, access to credit and inputs, and the institutional anchoring of innovations in extension systems and annual agricultural development plans. Combining digital Climate Information Services (CIS) with low-cost field technologies (such as Smart Valleys) is consistent with CSA principles and enhances farmers' ability to make timely decisions under greater climatic uncertainty. Moreover, Smart Valleys approaches to water management are also key to Integrated Soil Fertility Management (ISFM). Hence, there is a need to strengthen rice producers and other rice value chain actors ' capacity to

implement Smart Valleys approaches to water management in drought-flood-prone inland rice production areas in Mali.

Against this background of climatic stress, agronomic vulnerability, and nutritional risk, the AICCRA Mali cluster, together with government agencies, local partners and farmers, organized an important workshop on scaling Smart Valley approaches for inland water management. The training combines two mutually reinforcing aims: (1) strengthen capacity to deploy digital CIS that provide timely, localized advisories for site selection of valleys; (2) the development of Smart Valleys and management of valleys that raise resilience in lowland rice systems in Mali. By linking CIS, community-led Smart Valley development, and capacity building for extension agents and producer groups, the workshop addresses critical adoption bottlenecks (technical knowledge, localized data interpretation, and institutional coordination). The workshop also provides an evidence-generating platform for monitoring outcomes from pilot Smart Valleys and associated yield, income, and nutrition gains, providing a rationale for continued scaling of the innovation in rice production in Mali.

Objectives

The main objective of the training workshop is to enhance and strengthen the capacity of farmers' organizations, National Agricultural Research and Extension Systems (NARES), extension agents, service providers, NGOs, and government agencies to continuously scale Smart Valley approaches to water management, while integrating them into donors and agricultural programs and policies. The main objectives of the training workshop are:

- To continue promoting scaling initiatives of the AICCRA Mali cluster, through equipping farmers organizations, NARES, extension agents, donors, development programs (e.g., FSRP), NGOs, and local governments with capacity and skills to implement effectively locally relevant and context-specific Smart Valley approaches to water management, with the aim to enhancing climate resilience, rice productivity, farmers' income and food and nutrition security.
- To make Smart Valleys approach to water management an integral part of value chain activities in rice-based systems, ensuring long-term and effective engagement of value chain actors in business-oriented farming, and improving their economic gains and livelihoods.
- Identify key constraints that have limited farmers' uptake of the Smart Valleys approach to water management

- Highlight insights and lessons learned from accessing and using the Smart Valleys approach to water management, as well as the constraints, which are crucial for guiding sustained scaling.

METHODS

Participants and organizations:

The training workshop held on the 18th of November 2025 at Bamako, Mali, was attended by 22 participants (researchers, extension agents, NARES, service providers, lead farmers) from the Niger Office, Institute for Rural Economy (IER), the National Meteorological Agency (Mali-Météo), Collective Actions for Sustainable Agriculture in Mali (ACAD-Mali), Malian Association for Support and Advice to Community Initiatives (AMACIC), Selingue Rural Development Office (ODRS)http://magriculture.gouv.ml/index.php/les-offices?layout=edit&id=173, lead farmer representatives from cooperatives, and other local NGOs who are actively engaged in rice-value chain activities. Among the 22 participants, 30% of the participants were female. Participants came from three of the major rice-producing regions of Segou, Sikasso, and Koulikoro.

Training Workshop Approach and Tools

The workshop employed a participatory, practice-oriented, learning, and knowledge-sharing approach designed to strengthen the technical capacities of extension agents, lead farmers, and other actors in the rice value chain. Led and facilitated by lead trainers from AfricaRice and the AICCRA Mali team, farmers, NARES, extension agents, and other stakeholders also played a key role in knowledge sharing based on field experiences. To maximize learning outcomes, a combination of instructional tools and facilitation techniques was used:

- PowerPoint presentations: Provided conceptual foundations, technical explanations, and contextual information on the Smart Valley approach to water management through slides, visualizations, and diagrams. Short visual modules were used to illustrate complex processes, comparative advantages of innovations, and real-world field applications.

- Demonstrations: Trainers conducted step-by-step demonstrations of tools, technologies, or methodologies to translate theoretical concepts into practical understanding.

- Interactive brainstorming: Participants shared knowledge, field experiences, and perceptions before and after each module, ensuring engagement and knowledge co-creation, which is crucial for scaling and use of the Smart Valleys innovation.

- Hands-on exercises and breakout discussion: Subgroup discussions were organized where participants were able to engage in more intense discussion on different scenarios on development and use of Smart Valleys to reinforce learning outcomes.

- Q&A sessions: Incorporated after each module to clarify misunderstandings and deepen technical comprehension.

This multi-modal approach ensured that the workshop addressed different learning styles and enabled inclusive participation, especially among women, youth, and actors with varying levels of formal education.

SUMMARY OF KEY OUTCOMES FROM THE WORKSHOP

The training workshop on scaling Smart Valleys approaches to water management was highly interactive, with participants often asking questions and the presenter providing engaging responses, drawing on practical field experiences. The workshop generated rich insights, practical learning, and knowledge sharing across all five training modules. The session brought together extension agents, government representatives, rice farmers, NGOs, researchers, and service providers, creating a dynamic environment for learning and knowledge sharing where scientific principles, field-based experience, and local knowledge converged. Participants actively engaged through discussions, demonstrations, and problem-solving sessions, which strengthened their understanding of the Smart Valleys approach and its relevance to climate-resilient rice production in Mali. The following subsections present the key results achieved under each training module.

Introduction to the Smart Valleys approach for inland valley development

In the introductory module, the trainer successfully established a common understanding of inland valley ecology, the rationale for smart valley development, and the main attributes of the Smart Valleys approach. Participants demonstrated strong initial knowledge of the functional role of inland valleys but gained deeper insights into why traditional valley rice cultivation remains vulnerable to climate variability and water management inefficiencies, particularly in flood-prone areas.

The trainer clarified that Smart Valleys is a low-cost, participatory, and climate-smart technology that enhances water control, reduces erosion, and supports sustainable intensification. Discussions showed that participants appreciated the innovative valley approach's flexibility and suitability for small- to medium-sized inland valleys, typically ranging from 0.5 to 10 hectares, where conventional engineering-based schemes are economically unfeasible.

Participants also actively engaged in clarifying the added value of Smart Valleys compared to existing farmer practices. Through guided questioning, they identified that Smart Valleys enhances water retention, optimizes natural drainage, and significantly improves yields relative to labor input. The trainer highlighted the three-step development cycle for smart valleys:

- site selection,
- participatory development, and

- post-development management, and emphasized its replicability across Mali's inland valley systems.

The Q&A exchange revealed practical concerns, particularly regarding rainfall variability, irrigation needs during deficit years, and the role of canals in managing water inflows and outflows. These discussions underscored participants' growing interest in understanding the operational nuances of the approach.

Phase of selecting inland valleys suitable for the Smart Valleys approach

Participants demonstrated enhanced capacity to identify suitable inland valleys using a triple-layered selection framework comprising physical, socio-economic, and land tenure criteria. The trainer emphasized that site selection is the most critical determinant of successful implementation, and participants agreed that selection errors often lead to underperformance or abandonment of developed sites. During the interactive trainer-participant discussion, it was emphasized that climate information is crucial for guiding site selection, underscoring the need to support and scale bundle climate-smart agricultural practices, which are key to promoting profitable rice production.

Throughout the session, participants analyzed the detailed criteria:

- Physical considerations, including slope gradient, soil type, vegetation cover, hydrological regime, and accessibility.
- Socio-economic conditions, such as the number of farmers, gender roles, land uses, technical experience, and ongoing development programs.
- Land tenure dynamics, including ownership types, land access arrangements, and farmer–landowner relationships.

The participatory nature of the selection process became evident as participants discussed the five-step procedure comprising exploration, village consultation, technical survey, community validation, and documentation. They recognized that this inclusive process promotes community ownership and reduces conflicts, especially in areas where multiple users depend on the same valley. A technical question about the use of well water (groundwater) for supplementary irrigation sparked discussions on water sustainability and the need for context-specific recommendations. Participants concluded that Smart Valleys is primarily designed for rainfed lowlands but can integrate complementary irrigation where appropriate.

Smart Valleys development phase of inland valleys

The development module provided participants with detailed technical skills on the design and physical implementation of Smart Valleys structures. The trainer presented visual examples from Mali, Côte d'Ivoire, and Niger, enabling participants to compare diverse valley morphologies and development challenges. Participants learned the roles of extension agents, lead farmers, and other technical facilitators in providing technical guidance, as well as community mobilizers and coordinators of participatory development. The module highlighted that the Smart Valleys layout must respect natural drainage patterns and avoid engineering designs that contradict site-specific hydrology.

Key development components discussed included:

- staking and mapping plots using ropes: stakes, and color-coded paints, constructing primary and secondary bunds according to soil type
- designing water inlets, outlets, and drainage structures
- allocating plot sizes based on slope and labor availability
- applying simple leveling techniques to enhance proper water distribution.

Participants asked critical questions about water movement and the sizing of bunds for variable rainfall conditions. The trainer clarified that Smart Valleys does not eliminate ecological pressures but mitigates water-related risks through improved design.

Engagement during this module was exceptionally high as lead farmers and extension agents related the technical standards to their field realities. Many indicated that these design principles would strengthen their confidence in guiding communities during Smart Valley development.

Management of developed inland valleys and integrated soil fertility management (ISFM)

This module deepened participants' understanding of post-development challenges and the need to continuously maintain Smart Valleys to ensure long-term functionality. Through illustrations and case examples, participants learned that Smart Valleys' structures are highly effective when maintained regularly but can be compromised by heavy rainfall, erosion, and poor water management.

The trainer shared real cases of structural erosion, misaligned drainage canals, and incorrectly positioned water inlets during development. Participants learned practical management actions such as:

- reinforcing bunds through reshaping and stabilizing materials
- correcting drainage axes by widening, deepening, or stabilizing sensitive areas
- leveling plots to minimize water stagnation or overflow

- regularly monitoring inlets and outlets for clogging or erosion
- using stones or sandbags to stabilize drainage points.

Integrated Soil Fertility Management (ISFM) was presented as a complementary pillar of Smart Valleys. Participants learned soil fertility principles, including soil conservation, nutrient cycling, organic amendments, crop rotation, and the role of Smart Valleys in reducing erosion and improving soil organic matter. Discussions showed strong interest in how Smart Valleys can enhance not only land and water management but also soil health and long-term rice productivity in rainfed lowland ecologies.

Adoption of the Smart Valleys approach, capacity building, and scaling

The final module focused on adoption trends, scaling strategies, and lessons learned from 2022 to 2025. Participants reviewed AICCRA achievements in scaling Smart Valleys in rice-based systems in Mali, noting that Smart Valleys have expanded across three of the major rice-growing regions of Sikasso, Ségou, and Koutiala. Data shared during the session indicated positive rice yield gains when Smart Valleys are accompanied by improved rice varieties such as KAFACI-1 and ARICA-3. Lead farmers also testified that farmers in their communities have been experiencing early yield gains from adopting Smart Valleys approaches to water management in their inland rice fields. Participants also acknowledged the AICCRA project's success in building the capacity of agricultural practitioners from government ministries, staff, and extension agents from NGOs, university students, and rice farmer groups.

Insights and lessons learned from 2022 to 2025

Four years of Smart Valleys implementation under AICCRA Mali have generated important lessons:

- Community ownership drives success: Smart Valleys works best where communities take full ownership of planning, construction, and maintenance. High adoption rates were seen in villages with strong local leadership, women’s participation, and transparent land management.
- Low-cost, climate-smart solutions are practical and desired: Farmers appreciate that the approach requires minimal external inputs and improves water control, especially in drought-prone or flood-prone areas. The yield gains observed from 2022–2025 confirm its agronomic value and potential to enhance better livelihoods.
- Technical accuracy matters: Mistakes in pegging, slope interpretation, or drainage alignment can compromise the entire system. Throughout the

workshop, participants learned that sustained mentoring, refresher training, and field coaching are essential to avoid such errors.

- Maintenance is critical for long-term impact: Initial structures are manual and vulnerable during the first rainy season. Communities that committed to regular maintenance, particularly reinforcing bunds and cleaning drainage canals, sustained benefits across multiple years.

- Integration into local government planning ensures sustainability: The municipalities that included Smart Valleys in their Local Economic and Social Development Plans (PDESC), such as the commune of Baya (Selingué), have shown greater continuity of the approach beyond project funding.

- Scaling requires partnerships and multi-actor engagement: Collaboration with government agencies, NGOs, extension services, producer organizations, and universities has proven essential. These actors serve as multipliers, disseminating the approach far beyond project boundaries.

Constraints limiting access and use of the Smart Valleys approach

A rich discussion arose around community constraints. Participants raised questions about ownership of developed fields, the organization of group-based versus individual management systems, and the availability of demonstration plots and field days to speed up adoption.

Despite its strong adoption potential, several constraints emerged from discussions:

- Labour and time demands: The participatory, manual nature of Smart Valleys requires sustained community mobilization, which can be difficult in villages with limited labour or competing livelihood activities.

- Technical capacity gaps: Some communities lack local facilitators trained in proper layout, pegging, bund construction, and drainage management, leading to technical errors that reduce effectiveness and yield losses and loss of livelihoods.

- Maintenance challenges: The structures, particularly bunds and drainage canals, require regular upkeep. Without consistent maintenance, benefits decline after the first rainy season.

- Material shortages: Communities often lack basic tools such as pegs, strings, paint, and shovels, necessary for accurate layout and construction.

- Climate risks: Irregular rainfall, extreme floods, and early stop of rains can compromise lowland development and reduce confidence among farmers.

- Limited institutional integration: While progress exists, Smart Valleys is not yet systematically adopted by all extension systems or fully budgeted in local agricultural planning agendas.

- Land governance issues: In some lowlands, unclear land tenure or competing land uses (grazing, vegetables, rice) can limit adoption or cause disputes.

These constraints underline the need for sustained institutional support, more trained facilitators, and better planning tools to scale Smart Valleys effectively. Participants agreed that Smart Valleys is a highly promising approach for climate-resilient lowland development, but scaling requires continued investment in capacity building, community mobilization, and institutional integration.

The module concluded with several strategic recommendations, including:

- Integrating Smart Valleys into local development plans (PDESC)
- Leveraging the savings for change (EPC) model to strengthen the farmer organization
- Adopting the center for mechanized (CEMA) business model to support community-based equipment access
- Reinforcing farmer governance and participatory decision-making systems
- Mobilizing NGOs and local authorities for technical dissemination
- Creating university curricula modules on Smart Valleys to institutionalize knowledge
- Strengthening monitoring systems and baseline data collection.

OVERALL REMARKS FROM WORKSHOP PARTICIPANTS

Workshop participants expressed high satisfaction with the clarity, practicality, and relevance of the Smart Valleys training, emphasizing that the visual presentations and facilitated technical discussions significantly enhanced their understanding of inland valley development. Many highlighted that the participatory nature of the approach, particularly the emphasis on community engagement and co-design, aligns well with the realities of rural Mali, where land tenure complexity, labor availability, and communal decision-making strongly influence the success of development initiatives. Participants appreciated the opportunity to compare experiences across neighboring countries, noting that the Smart Valleys methodology effectively addresses challenges posed by climate variability and offers a viable alternative to costly engineered lowland schemes. They emphasized that the training addressed critical knowledge gaps in water control, bund construction, drainage alignment, and post-development

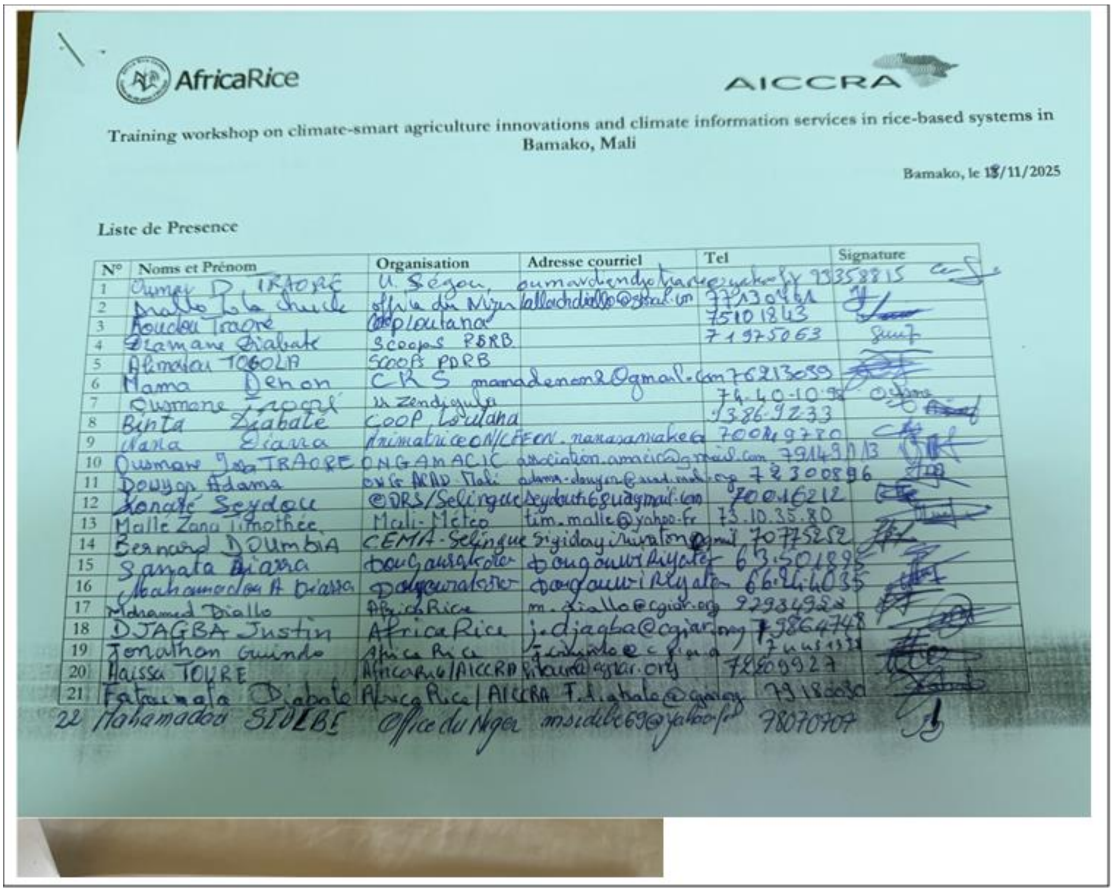
maintenance in areas that often limit the performance of existing lowland interventions.

Moreover, participants underscored the importance of continuous capacity building, especially for farmer cooperatives, women's groups, and local extension agents who play a central role in sustaining developed sites.
Several participants recommended stronger institutional integration of Smart Valleys into local development plans and agricultural extension systems, and called for increased resource allocation to support scaling efforts in additional lowland communities. Overall, participants recognized the Smart Valleys approach as a practical, climate-resilient, and scalable solution for improving rice productivity in Mali, and expressed strong commitment to applying and disseminating the knowledge gained during the workshop

CONCLUSION

In conclusion, the AICCRA Mali workshop successfully strengthened participants' technical and practical understanding of the Smart Valleys approach, combining scientific guidance with rich field-based exchanges. Through detailed modules, hands-on discussions, and collaborative problem-solving, participants deepened their knowledge of lowland selection, participatory development, water management, and post-development maintenance, which are all essential for scaling climate-smart rice production. The capacity-building workshop highlighted both the strong potential of Smart Valleys and the persistent constraints facing communities, including labour shortages, technical capacity gaps, maintenance challenges, and climate risks. Drawing on lessons from 2022–2025, participants emphasized the importance of community ownership, accurate technical execution, sustained mentoring, and integration of Smart Valleys into local planning systems. These insights provide a solid foundation for expanding the Smart Valleys approach across Mali as the AICCRA project advances toward the next phase of climate-resilient agricultural scaling.

APPENDIX



AfricaRice AICCRA

Training workshop on climate-smart agriculture innovations and climate information services in rice-based systems in Bamako, Mali

Bamako, le 13/11/2025

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Appendix 1: Attendance list

REFERENCE

IPCC (2022). Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the IPCC, Chapter 9 (Africa). Intergovernmental Panel on Climate Change.

van Oort, P. A. J., & Zwart, S. J. (2018). *Impacts of climate change on rice production in Africa and causes of simulated yield changes.* Global Change Biology, 24(3), 1029–1045.

Lipper, L., Thornton, P., Campbell, B. M., et al. (2014). Climate-smart agriculture for food security. Nature Climate Change, 4, 1068–1072.

Defoer, T, Dugué, M-J, Loosvelt, M, and Worou, S. 2017. Smart Valleyss: Trainer-facilitator's manual. Abidjan, Côte d'Ivoire: Africa Rice Center (AfricaRice). 130 pp.