

Stakeholder Engagement in the Development of Kenya's Nature-based Solutions Monitoring & Evaluation Framework: *Outcomes and Lessons from Stakeholder Participation in the Chyulu Hills*

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Contributors & Acknowledgements

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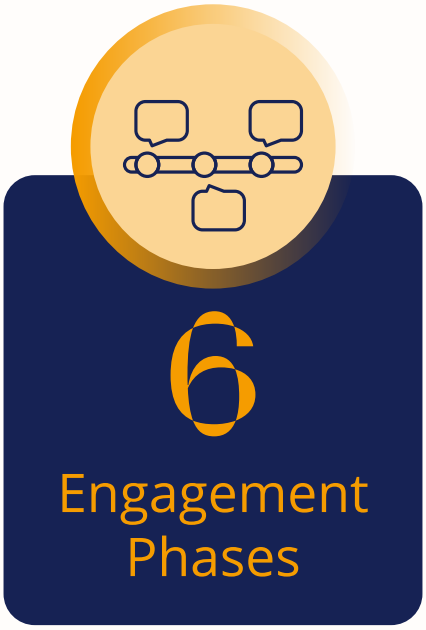
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Engagement at a Glance







1. Introduction

Nature-based Solutions (NbS) have emerged as vital approaches for addressing the triple challenges of climate change, biodiversity loss and ecosystem degradation while simultaneously advancing sustainable development goals. According to the International Union for Conservation of Nature (IUCN), NbS are "actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits" (IUCN, 2020). In Kenya, NbS are increasingly reflected in key national climate and development frameworks, including the National Climate Change Action Plan (NCCAP 2023–2027), the Second Nationally Determined Contribution (NDC 2023–2027) and the National Adaptation Plan (NAP 2015–2030), which collectively recognize ecosystem-based approaches such as reforestation, sustainable land management, Climate Smart Agriculture (CSA) and landscape restoration as essential pathways to reduce emissions, enhance resilience and generate co-benefits for livelihoods and biodiversity (MENR, 2023; GoK, 2022).

Kenya has numerous NbS initiatives already underway, but their effectiveness and scalability are constrained by the absence of systematic assessment and monitoring frameworks (GCA, 2025). This necessitates the establishment of a Monitoring and Evaluation (M&E) system that can track their outcomes in a credible, transparent and policy-relevant manner. In particular, the ability to link local-level interventions such as those in the Chyulu Hills landscape to national indicators and global reporting obligations is critical for demonstrating impact and informing future planning.

Through coordinated stakeholder engagement, the NbS M&E Framework developed under the Initiative for Climate Action Transparency (ICAT) project is designed to strengthen Kenya's NDC reporting by ensuring that data from NbS initiatives are systematically captured, aggregated, and used to track progress toward emission reduction and resilience targets. The project, implemented by the Alliance of Bioversity International and CIAT, primarily supports the Ministry of Agriculture and Livestock Development (MoALD) in developing a M&E Framework for monitoring the outcomes of NbS interventions.

The development of the NbS M&E framework involved an extensive stakeholder engagement process, which was not treated as a one-off consultation, but as a foundational and strategic pillar for the framework's design. NbS are inherently multi-sectoral and multi-level, involving diverse actors with different mandates, knowledge systems and capacities. The development of a credible and usable framework therefore required the perspectives of national government ministries, county governments, research institutions, academia, community-based organizations, private sector actors and NbS implementation partners. Their structured involvement was essential to align the framework with existing monitoring systems, avoid duplication and promote data harmonization with instruments such as the CSA M&E Framework, forest restoration monitoring systems and broader NDC tracking mechanisms (UNEP, 2021).

Why Stakeholder Engagement?



Align framework with existing monitoring systems and avoid duplication



Incorporate local and indigenous knowledge on ecosystems and resilience



Promote trust, accountability, and institutional buy-in for sustained data generation



Ensure culturally appropriate, ecologically relevant, and practically implementable indicators

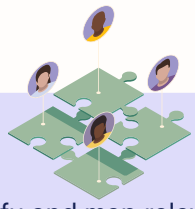
Engaging stakeholders ensured that the framework meaningfully incorporates local and indigenous knowledge on ecosystems, production systems, and resilience practices.

Communities and local actors hold a nuanced understanding of landscape dynamics, climate risks, and adaptation strategies that are often underrepresented in formal monitoring systems. By bringing these perspectives into indicator design and data collection protocols, the NbS M&E Framework is better positioned to be culturally appropriate, ecologically relevant, and practically implementable (FAO, 2022; IPBES, 2019). Inclusive and participatory processes promote trust, accountability, and institutional buy-in, which are critical conditions for sustained data generation, validation, and use over time (ICAT, 2020).

The stakeholder engagement process was guided by a deliberate engagement plan that outlined how stakeholders were identified, consulted and involved, as well as the methods used and the management of information and feedback. The CIAT technical team worked closely with the MoALD Climate Change Unit (CCU) that supported coordinative engagements at the national level. At the county level, the CSA multi-stakeholder platform coordinators organized forums on behalf of County Executive Committee Members (CECMs) for Agriculture. This approach ensured both vertical coordination between national and county institutions and horizontal coordination across sectors and initiatives. Engagement modalities included in-person workshops, virtual consultations, technical review meetings and targeted follow-ups. Communication and information sharing were maintained to ensure that stakeholders remained involved throughout the different stages of framework development. This iterative and co-creative approach was designed to build ownership of the NbS M&E framework, while ensuring its alignment with Kenya's NDC reporting architecture under the UNFCCC transparency framework, NAP implementation and sectoral monitoring frameworks (MENR, 2023; GoK, 2022).

The stakeholder engagement process also served several interlinked purposes, supporting the co-design of NbS indicators and data flows; clarifying institutional roles and responsibilities; identifying capacity gaps and support needs; and building a shared vision for an integrated and adaptive NbS M&E system that can inform both national and county decision-making as well as international reporting.

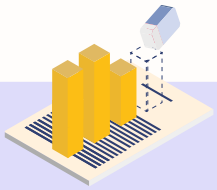
The specific objectives of the stakeholder engagement were to:



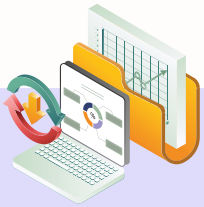
- identify and map relevant stakeholders involved in NbS interventions planning and implementation, data generation, and policy formulation;



- facilitate consultation and collaborative design of NbS-specific results areas, indicators, data flows and reporting protocols for NbS tracking;



- align the NbS M&E Framework with the NDC reporting architecture (Climate t) and sectoral M&E systems (including CSA, forestry and water);



- strengthen institutional capacity and ownership for sustainable data management and reporting at national and sub-national levels; and



- establish communication and feedback mechanisms for continuous learning across national and local policy levels.

2. Participatory Stakeholder Engagement and Co-Design Methodology

2.1 Framework for Stakeholder Identification and Mapping

Stakeholder identification and mapping provided a systematic foundation for recognizing all actors who influence, contribute to, or are affected by NbS implementation, monitoring, and reporting. This process was critical for ensuring an inclusive and coordinated development process, strengthening cross-sectoral collaboration, and ensuring that community perspectives and knowledge systems are integrated into national and sub-national monitoring mechanisms. This exercise was essential for ensuring the development process reflects both policy priorities and field-level realities

The identification process followed a multi-tiered, participatory approach to encompass actors from national, county, and community levels, as well as from technical, policy, and implementation domains. To ensure inclusion of all relevant actors at national, county and community level the following steps were undertaken (Table1):

- **Policy and Institutional Review:** Analysis of Kenya national policies and institutional mandates to identify key actors with NbS-related responsibilities within the Chyullu landscape.
- **Key Agency Consultation:** Engagement with the Ministry of Agriculture and Livestock Development (MOALD) to identify institutions actively operating in the landscape, particularly in data collection, coordination, and policy reporting.
- **Coordination Structure Mapping:** Review of existing multi-stakeholder platforms and fora at national and county levels to map current coordination pathways.
- **Stakeholder Categorization:** Classification of stakeholders by their level of engagement, interest, and influence, guided by established methodologies (ICAT, 2020; UNDP, 2019).

Given the aim of the framework to inform support NDC reporting, the mapping also sought to describe the NbS institutional landscape, identify data sources, clarify responsibilities, and outline coordination pathways essential for tracking NbS contributions to national adaptation and mitigation targets under the Paris Agreement's Enhanced Transparency Framework (ETF) (UNFCCC, 2018; MENR, 2023).

Three Levels of Consultation

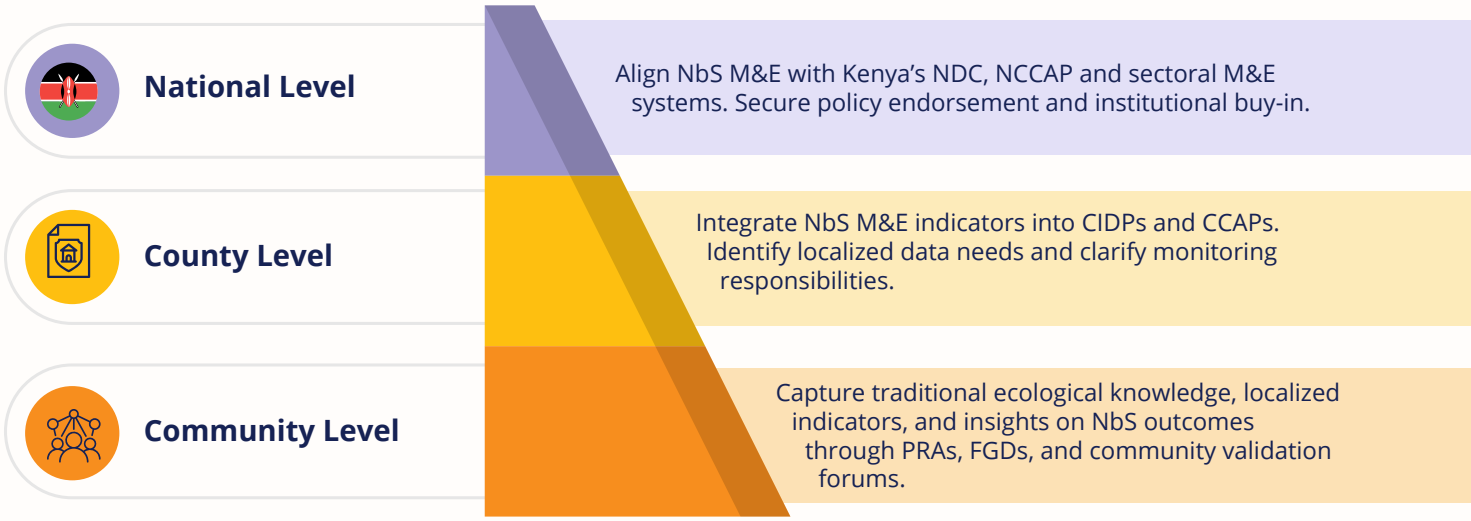


Table 1: Stakeholders involved in NbS interventions in Kenya, and Chyulu Hills

Institution	How they support NbS	Areas of Coverage
Government Agencies		
Kenya Forest Service (KFS)	Forest conservation, afforestation, forest landscape restoration	Chyulu Hills Forest Reserve and adjacent forested areas
Kenya Wildlife Service (KWS)	Wildlife protection, management of Chyulu Hills National Park, anti-poaching	Chyulu Hills National Park and other protected areas
National Environment Management Authority (NEMA)	EIA/SEA reviews, coordination of environment policies, monitoring	All counties including Makueni, Kajiado, and others around Chyulu
Kenya Water Resource Authority (KRTA)	Management of Chyulu as a water tower, ecosystem rehabilitation	Chyulu Hills and other national water towers
Ministry of Environment, Climate Change and Forestry	Policy direction, climate action, funding support for NbS	National with county-level implementation
County Governments (Makueni, Kajiado, Taita Taveta)	Local planning, implementation of NbS in agriculture, water, forestry	Chyulu ecosystem landscape
Multilateral Organizations		
UNDP	Supports Climate Information Management System (CIMS), biodiversity and climate projects	Chyulu and broader Kenyan ecosystems
UNEP	Ecosystem restoration, NbS frameworks, monitoring indicators	National and transboundary ecosystems
FAO	Promotes agroforestry, sustainable land management, FLR	Agriculture zones bordering Chyulu Hills
IUCN	Policy guidance, community-based NbS, assessment tools	Protected areas including Chyulu Hills
World Bank	Financing NbS through programs like KCSAP, climate-smart agriculture	Wider Kenyan landscapes including ASALs
Non Governmental Organizations		
The Nature Conservancy (TNC)	Chyulu Water Fund, watershed protection, REDD+	Chyulu Hills and Tsavo Conservation Area
African Wildlife Foundation (AWF)	Landscape conservation, wildlife corridors, community NbS	Chyulu-Tsavo-Amboseli landscape
Wildlife Works	REDD+ carbon projects, community conservation, sustainable land use	Kasigau, Chyulu REDD+ Project
Conservation International	Climate resilience, forest restoration, ecosystem valuation	Chyulu Hills and other biodiversity hotspots
Green Belt Movement	Reforestation, community tree planting	Forest-adjacent communities, including Chyulu periphery

Institution	How they support NbS	Areas of Coverage
Research & Academic Institutions		
World Agroforestry (ICRAF)	Agroforestry research, landscape restoration, NbS M&E	National with pilot sites around Chyulu
Kenya Forestry Research Institute (KEFRI)	Research on indigenous trees, forest management, FLR	Chyulu Hills forest and other water towers
University of Nairobi (UoN)	Research, policy evaluation, biodiversity and NbS studies	National; research in protected areas
Southeastern Kenya University (SEKU)	Community-based NbS, dryland ecosystem research	Eastern Kenya including Chyulu zone
Civil Society Organizations (CSOs), and Community-Based Organizations (CBOs)		
Chyulu Hills Conservation Trust	Community benefit-sharing, forest conservation	Greater Chyulu ecosystem
Makueni/Kajiado Water Resource Users Associations (WRUAs)	Watershed management, catchment protection	Chyulu catchments
Community Forest Associations (CFAs)	Co-management of forests, reforestation, fire control	Chyulu forest reserves
Pastoralist and farmer cooperatives	Restoration of degraded lands, sustainable grazing, climate-smart agriculture	Buffer zones of Chyulu Hills

2.2 Guiding Principles for Stakeholder Engagement

Inclusivity
Involving local communities in consultations ensuring diverse representation

Transparency
Sharing all draft materials and reports with all stakeholders

Accountability
Clear feedback mechanisms ensuring contributions were valued

Knowledge Diversity
Integrating community-based monitoring with scientific data

Empowerment
Providing pre-consultation training for capacity strengthening

Continuous Learning
Periodically reviewing and refining engagement strategies

The stakeholder engagement process was guided by a set of structured principles that promote inclusivity, transparency, accountability, and continuous learning. The framework's design ensured the meaningful involvement of all relevant stakeholders (from national policymakers to local communities), ensuring their inputs were incorporated in shaping its design, piloting, and operationalization. This approach is grounded in, and draws from several frameworks and mandates, including: The ICAT Stakeholder Participation Guidance (2020,) The UNDP Stakeholder Engagement Framework (2019,) and The Kenya Climate Change Act (2023), which legally mandates participatory approaches in climate governance.

This approach ensured inclusivity and representation by involving local communities in consultations, while transparency was maintained by sharing all draft materials and reports. To ensure contributions were valued, a clear accountability mechanism was implemented through feedback mechanisms, and respect for knowledge and diversity was

demonstrated by integrating community-based monitoring with scientific data. Furthermore, the process aimed at empowerment and capacity strengthening by providing pre-consultation training, and it embedded continuous learning and adaptation by periodically reviewing and refining engagement strategies based on stakeholder feedback.

2.3 Power/Influence Analysis

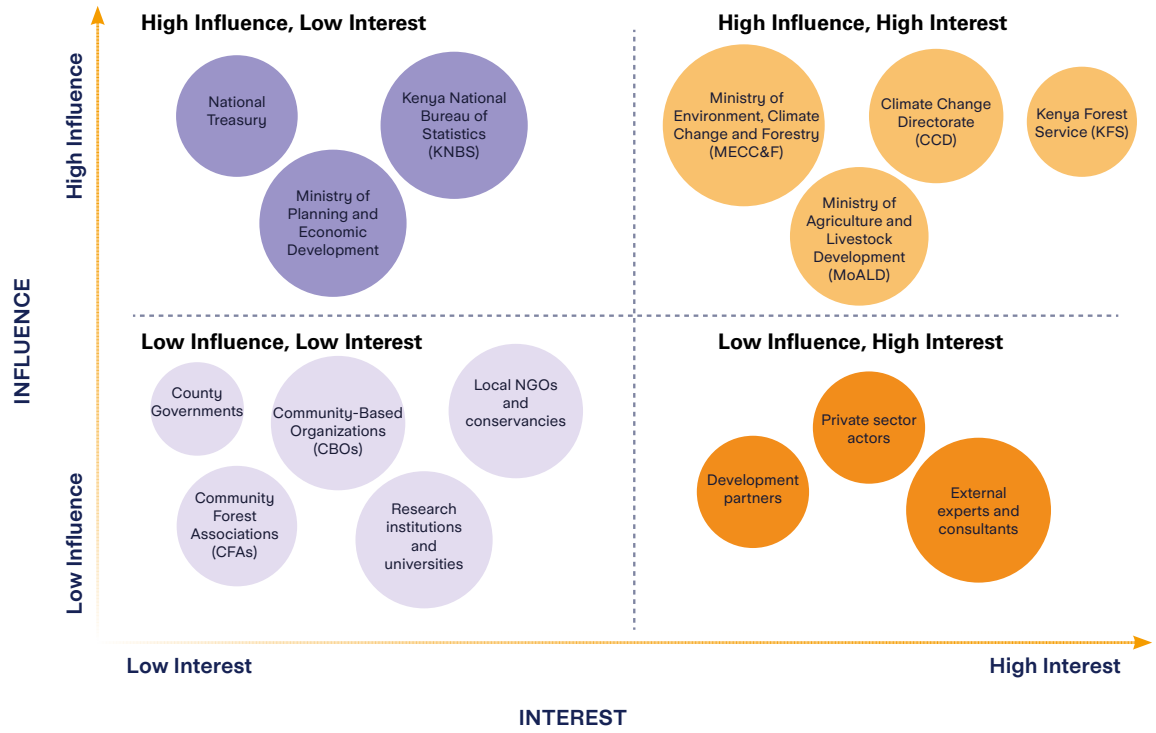
Building on the foundational mapping, a power-influence analysis (Table 2) was conducted to strategically categorize stakeholders according to their levels of authority and engagement. The rationale for this was to identify stakeholders in terms of their level of influence in the NbS space. This was conceptualized broadly as a scoping mission exercise to have the ability of different actors to shape knowledge, experiences, networks, and intervention pathways around NbS. Further, the framing underpins the rationale for identifying and categorizing stakeholders according to their varying levels and forms of influence within the NbS landscape.

This was essential for targeted engagement, effective multi-sectoral coordination, and resource efficiency, while directly advancing the framework's core principles of inclusivity and transparency.

The analysis segmented stakeholders into four key groups to guide the engagement strategy:

- **High Influence/High Interest actors:** that included national ministries, were engaged as core partners to integrate NbS into national systems.
- **High Influence/Low Interest institutions:** such as the National Treasury, were targeted for advocacy to align data and budgets.
- **Low Influence/High Interest groups:** including county governments and local communities, were prioritized for capacity building to ensure their vital ground-level data feeds into reporting.
- **Low Influence/Low Interest actors:** such as private sector partners, were identified for awareness-raising to unlock their potential catalytic role. This nuanced approach ensured that participation was not only broad but also strategically focused to clarify accountability and strengthen the entire NbS monitoring value chain for NDC reporting.

Table 2: Stakeholder influence-interest matrix



2.4 Stakeholder Categories



The categorization of stakeholders builds directly on the stakeholder identification and mapping process, which demonstrates how diverse institutions and community actors collectively enable an inclusive, coordinated, and knowledge-driven NbS monitoring system at both national and sub-national levels.

To ensure vertical integration and coherence across governance systems, stakeholder engagement was organized around three interlinked levels including national, county, and community. This structure ensured that insights, data, and responsibilities flowed effortlessly from local ecosystems to national climate reporting processes.

National Level Consultation: This level focused on aligning the NbS M&E Framework with Kenya's NDC, the National Climate Change Action Plan (NCCAP), and existing sectoral M&E systems. National consultations also aimed to secure policy endorsement, institutional buy-in, and harmonization of indicators across agriculture, forestry, water, and environment sectors. Engagement methods included national inception and validation workshops, technical working group meetings for indicator harmonization, and policy dialogues with development partners and private sector actors.

County (sub-national) Level Consultation: At the county level, the consultations aimed to integrate NbS M&E indicators into County Integrated Development Plans (CIDPs) and County Climate Action Plans (CCAPs). These engagements identified localized data needs, clarified monitoring responsibilities, and supported co-design of tailored county monitoring frameworks. Participatory planning sessions and county stakeholder workshops ensured that county governments, key implementers of NbS on the ground, could effectively generate data for national aggregation. Counties such as Makueni, Kajiado, and Taita Taveta, which host the Chyulu Hills landscape, provided valuable ecosystem-level insights that align with NDC objectives.

Community Level Consultation: Community engagement sought to capture traditional ecological knowledge, localized indicators, and insights on NbS outcomes that are essential for culturally grounded and context-specific monitoring. Participatory rural appraisals (PRAs), focus group discussions (FGDs), and community validation forums ensured community ownership and enhanced the sustainability of the monitoring process. Use of local languages, visual tools, and inclusive facilitation approaches strengthened accessibility and participation.

2.4.1 National Government Institutions

National ministries, agencies, and technical bodies play a central role in policy formulation, resource mobilization, indicator development, and national reporting under the Paris Agreement. Their leadership ensures policy coherence, data harmonization, and institutional coordination across sectors. These actors safeguard transparency and evidence-based reporting of NbS outcomes in national and international submissions.

2.4.2 County Governments

County governments are pivotal in NbS implementation because they manage natural resources at the landscape and community levels. Their responsibilities include coordinating local data collection, facilitating participatory monitoring, integrating NbS reporting into county climate and development plans, and feeding localized evidence into national NDC reports. The active work of counties in the Chyulu Hills landscape demonstrates the value of county-led NbS interventions.

2.4.3 Research and Technical Institutions

These institutions support data validation, modeling, and methodological standardization to ensure MRV-quality reporting. Their ongoing research in ecosystems such as the Chyulu Hills provides essential evidence and technical inputs that strengthened indicator development and the overall NbS M&E Framework.

2.4.4 Civil Society Organizations (CSOs), NGOs, and Community-Based Organizations (CBOs)

CSOs and NGOs contribute to inclusive and gender-responsive design and implementation of the M&E Framework. They facilitate community engagement, capacity building, and integration of equity considerations, ensuring that monitoring processes reflect diverse community realities.

2.4.5 Private Sector Actors

Private companies involved in ecosystem restoration, sustainable agriculture, and carbon markets contribute to the data-to-finance feedback loop essential for NbS investment justification. Their roles include supplying data on carbon credits and restoration outcomes, participating in verification processes, and mobilizing financing through public–private partnerships.

2.4.6 Development Partners

Development partners and donors support the framework through technical expertise, funding, and capacity building. They help harmonize project-level M&E systems with national requirements and facilitate alignment with global frameworks such as the UNFCCC Enhanced Transparency Framework (ETF) and SDGs.

3. Phases of stakeholder engagement and outcomes

Six-Phase Engagement Process

Ph.1	Ph.2	Ph.3	Ph.4	Ph.5	Ph.6
Inception & Scoping	M&E Co-Design	Indicator Refinement	Formal Validation	Piloting	County Capacity

Phase 1: Inception and Scoping

Objective: *To understand the NbS landscape in terms of interventions, implementers, tools used to measure NbS, and actors operating at various levels within the Chyulu Hills ecosystem.*

This phase aimed at identifying stakeholders, define the project's scope, and initiate the co-design of a robust Monitoring and Evaluation (M&E) framework. In collaboration with the Ministry of Agriculture and Livestock Development (MoALD) – Climate Change Unit (CCU), the Alliance of Bioversity International and CIAT, and with support from the Initiative for Climate Action Transparency (ICAT) and UNEP Copenhagen Climate Centre, an inception workshop was convened to address these goals. A diverse stakeholder group were represented in the workshop including other sectoral ministries like environment, water and irrigation both from national and subnational, national research institute, academia, government parastatals like KWS and KFS, development partners and CBOs.

The workshop provided a comprehensive overview of the project scope and its alignment with national (NDCs, NCCAP) and global (Paris Agreement) climate goals. It served as a scoping mission helped identify key NbS interventions, stakeholders, and existing monitoring tools in the Chyulu Hills landscape, and further identify and map stakeholders' roles to support their active participation in developing and implementing the NbS M&E framework development process.

Further, through plenary sessions and breakout room discussions, participants identified a wide range of NbS interventions currently underway in and around the Chyulu Hills, categorized as follows:



Land Restoration

Pasture reseeding, grazing plans, silvopasture, soil conservation, invasive species control



Water Resources

Spring and wetland protection, rainwater harvesting (sand dams, shallow wells), water level monitoring



Reforestation & Agroecology

Community tree nurseries, planting indigenous species (Mukau, Mwarubaini), afforestation, biofertilizers



Biodiversity & Human Wildlife Conflict Management

Wildlife corridors, livestock bomas, wildlife censuses, ecotourism, apiculture



Community Livelihoods

Sustainable Land Management training, beekeeping, drought-resistant crops, livestock improvement

The workshop also successfully mapped key actors essential for moving forward in the development of M&E frameworks. To guide engagement, these stakeholders were analyzed using a Power–influence/Interest Grid model[1], categorizing them by their influence (Power) and concern for project outcomes (Interest). Their roles were identified as:

- **Local Communities:** Farm-level implementers, primary beneficiaries, and holders of indigenous knowledge.
- **County Governments:** Responsible for policy coordination, county-level resource mobilization, and extension services.
- **National Government Agencies:** Providers of national policy direction, research, and conservation funding.
- **Academia and Research Institutions:** Offering technical expertise, data, and capacity building
- **NGOs/CSOs/Development Partners:** Supplying technical assistance, advocacy, and on-the-ground NbS interventions implementation.

1 Power-Influence Interest Grid Model

The insights from stakeholders formed an evidence base that informed the literature review and analysis of the NbS framework. In addition, the findings for the scoping stakeholder workshop highlight that effective development of NbS M&E frameworks should prioritize integration, inclusivity, and practicality. A key lesson is the value of building existing systems rather than creating new ones from scratch. Aligning NbS frameworks with established, government endorsed structures such as Climate-Smart Agriculture platforms not only reduces duplication and reporting burdens but also accelerates adoption and ensures consistency with national and global Climate Action reporting commitments. At the same time, the process underscores the importance of multi-stakeholder co-design, where national and local governments, researchers, NGOs, and communities collaboratively shape the framework development process. This approach helps reconcile top-down policy requirements with the actual situation, fostering ownership.

The synthesis further emphasizes that M&E frameworks must go beyond environmental metrics to include socio-economic dimensions and financing linkages. Understanding drivers such as land tenure, gender dynamics, and economic incentives is essential for explaining adoption and sustainability of NbS interventions. Moreover, positioning M&E as a tool for demonstrating impact can help unlock climate finance by providing credible evidence of benefits. To ensure usability, indicators must be simplified, clearly defined, and standardized, allowing data from diverse stakeholders to be comparable and actionable.

Phase 2:

M&E Framework Co-Design Process

Objective: *To create an initial draft framework grounded in evidence and multi-stakeholder input.*

A structured analysis of multi-stakeholder input during the scoping mission helped identify core problem areas that formed the basis for developing the draft M&E Framework categorized into three main themes: **Unsustainable agricultural practices among communities around the Chyulu Hills Conservancy, Increased climate change impacts and risks and Encroachment on protected ecosystems,** that drive ecosystem degradation in biodiversity hotspots and further mapped the corresponding NbS interventions.

A participatory approach guided the development of Logical Pathways and Indicators, serving as the synthesis step of the process. This co-design process was undertaken through a stakeholder workshop that brought together representatives from Ministry of Agriculture and Livestock Development Climate Change Unit (MoALD CCU), Second Mile, Adapt Kenya, Conservation International, ACT Network, UTANU Africa, Eco Adaptation, and Monitoring and Evaluation specialists from the Alliance of Bioversity International and CIAT. These participants contributed technical expertise and practical insights, and some formed part of the core team that played a critical role in the development of the CSA M&E framework, ensuring alignment across processes.

Using scoping inputs, and the inputs from this workshop, the core technical implementing team developed logical pathways (a Theory of Change) that articulated:



Drivers: Pressures such as soil erosion from unsustainable farming that intensify climate impacts, biodiversity loss, and ecosystem degradation.



Interventions: NbS actions, including conservation agriculture with trees, designed to reduce these impacts.



Outcomes: Desired changes such as improved soil health and stabilized slopes.



Indicators: Measurable metrics to track progress (such as percentage increase in vegetation cover, reduction in soil loss tons/hectare).

The three thematic areas emanated from multi-stakeholder input during the scoping mission areas, and the co-design workshop, provided the basis for mapping appropriate NbS interventions. Through a participatory process, these insights were translated into logical pathways (Theory of Change) that articulated the relationship between drivers (such as soil erosion and land degradation), interventions (including conservation agriculture with trees and ecosystem restoration measures), expected outcomes (such as improved soil health and stabilized landscapes), and measurable indicators (including vegetation cover change and reduction in soil loss). This structured approach ensured that the framework is grounded in real-world challenges while providing a clear pathway for monitoring progress.

Another key lesson that came from the engagement is the importance of developing a clear, context-specific, and manageable indicator system. The framework must distinguish between underlying drivers of environmental change and their solutions (interventions) to ensure that reporting focuses on actionable issues such as land use practices rather than broad demographic trends. At the same time, there is a need to balance comprehensiveness with simplicity by avoiding indicator overload and prioritizing a streamlined set of metrics that align with existing CSA systems. Global frameworks should also be localized, translating broad international commitments into practical, measurable outcomes that reflect national and landscape realities.

The findings further emphasize that NbS M&E systems must be socially inclusive, well-coordinated, and flexible. Integrating social and governance dimensions including land tenure, inclusion of marginalized groups, and community decision-making structures are essential for understanding the drivers of success and lack of achievement in NbS interventions. Clear definition of roles and responsibilities across stakeholders is also critical to ensure effective data collection and reporting. In addition, the framework should remain flexible enough to accommodate both existing and emerging interventions while recognizing synergies across NbS approaches to improve efficiency and avoid duplication.

During the first and second phases of the framework development, targeted bilateral engagements were undertaken with key institutions that have developed or applied NbS and related Monitoring and Evaluation (M&E) frameworks. These included organizations such as IUCN, WWF, and UNEP, which shared relevant tools, methodologies, and reference materials to inform the design process. In parallel, a structured review of existing NbS and sectoral M&E frameworks, including those developed by World Agroforestry (ICRAF) and other research and development partners, was conducted to draw lessons on indicator selection, data flows, and reporting structures.

These engagements and literature reviews were critical in ensuring that the NbS M&E framework was not developed in isolation but rather aligned with existing global and national frameworks. Emphasis was placed on identifying areas of complementarity, minimizing duplication, and ensuring consistency with established reporting systems, including CSA M&E frameworks and broader NDC reporting mechanisms. Stakeholders were informed throughout the process that the framework would continue to be iteratively refined to maintain alignment with these systems.

Building on this foundation, a virtual technical workshop was convened at the end of Phase 2, bringing together members of the core technical team and selected stakeholders who had participated in earlier engagements. The objective of this workshop was to present the draft NbS M&E framework, including the developed Theory of Change, and to assess its conceptual clarity, coherence, and practical applicability ahead of the next phase of refinement. This engagement served as a critical internal and external review point, allowing stakeholders to validate the logical pathways, provide targeted technical inputs, and ensure that the framework was sufficiently robust and aligned before progressing to Phase 3.

Phase 3:

M&E Framework Co-Design and Indicator Refinement

Objective: *To assess the draft M&E Matrix/framework's logic and practicality, ensuring clarity of indicators and overall structural soundness.*

This phase of implementation was informed by the subsequent workshops, which formed the core of the methodological approach and was structured as a participatory co-design process.

The process was grounded in a review of global NbS standards (including Bonn Challenge, UN Decade on Ecosystem Restoration) and Kenya's national reporting commitments (NDCs, NCCAP, BTR). This ensured the framework would not be created in isolation but would align with and feed into existing National reporting structures, particularly the national Climate-Smart Agriculture (CSA) M&E Framework.

The methodology emphasized harmonizing data collection, avoiding duplication of indicators, and integrating with the national CSA M&E system to streamline reporting for the NDCs and BTRs. Plenary discussions following group work led to several significant methodological refinements:

- Broad terms such as "exotic species" and "use of fertilizers" would be replaced with more precise, ecosystem-relevant language
- Indicators related to drivers and solutions would be structurally separated to clearly differentiate problem tracking from intervention monitoring.
- A formal stakeholder analysis would define ownership and responsibilities for data collection.
- The framework would shift from output-based measures (such as, number of trainings) to outcome-oriented indicators reflecting real behavioral and ecological change.
- The design would remain generic enough for national applicability while allowing NbS projects to tailor implementation to different ecosystems
- Capacity building and indigenous knowledge would be reframed as enabling conditions rather than NbS interventions.

Phase 4:

Formal Validation of the Matrix and Tools

Objective: *To get stakeholder buy-in by validating the accuracy, relevance, and practicality of the finalized M&E Matrix and data collection tools before piloting.*

This phase served as the final quality-assurance step. Through a structured review involving technical experts from government (Ministry of Agriculture and Livestock Development (MoALD) – Climate Change Unit (CCU), Ministry of Environment – Climate Change), development partners including IUCN and Global Alliance for Improved Nutrition and the Food and Land Use Coalition (GAIN-FOLU), and M&E specialists, stakeholders engaged in plenary discussions, breakout sessions, and detailed examination of each indicator and tool. Their feedback guided targeted refinements, including clarifying key drivers, adjusting or relocating sensitive indicators, enhancing feasibility through improved disaggregation, clearer tool guidance, and better enumerator preparation.

The validation exercise also confirmed the framework's relevance for national climate reporting, prompting further simplification and stronger alignment with existing CSA and GHG inventory tools. These insights were integrated into the methodology, resulting in a validated, practical, and ready-to-pilot system.

It emerged from both the validation and co-design processes is the importance of methodological clarity and structural rigor in framework design. Participants highlighted the need to distinguish clearly between drivers of degradation and the solutions (interventions) addressing them, ensuring that indicators track both problems and responses without conflation.

The iterative and inclusive engagement was critical for ensuring both technical quality and stakeholder ownership of the developed NbS M&E Matrix. The workshop, as the culmination of multiple rounds of consultations, demonstrated that continuous validation with diverse actors including government (MoLAD), technical experts, and development partners, strengthens the credibility, usability, and acceptance of the framework. This iterative co-design process ensured that indicators reflect real on-the-ground challenges while also aligning with national policy and reporting requirements.

Thirdly is the importance of refining indicators to balance scientific rigor with practical usability. While stakeholders confirmed that most identified drivers were relevant, they emphasized the need for context-specific adjustments, consolidation of overlapping metrics, and removal of less relevant indicators. This highlights that effective M&E frameworks should remain flexible and adaptive, allowing refinement based on user feedback. Additionally, separating data collection approaches such as using household surveys for quantitative indicators and Key Informant Interviews (KIIs) for sensitive or qualitative data emerged as a critical methodological improvement to enhance data accuracy and reliability.

The workshop also underscored the need to clearly define data collection roles, methods, and levels of responsibility. Another major lesson is that not all indicators can or should be collected at the same level; some require farmer-level data, while others depend on institutional or biophysical assessments. This distinction is essential for ensuring feasibility and data quality.

Furthermore, the importance of enumerator training, provision of clear guidance (such as bracketed hints for technical indicators), and consideration of alternative approaches like group-based data collection were highlighted as practical measures to improve consistency and reduce errors during field implementation.

Another important lesson relates to the integration of the framework within existing systems and its alignment with national Climate Action reporting processes. Stakeholders emphasized that the NbS M&E framework fills a critical gap in tracking adaptation outcomes and contributes directly to Kenya's reporting under the NCCAP, NDCs, and Biennial Transparency Reports (BTRs). However, to remain sustainable, the framework must be harmonized with existing tools such as the CSA M&E system and GHG inventory. This integration reduces duplication, enhances efficiency, and ensures that collected data feeds directly into national and international reporting obligations.

Finally, the workshop highlighted the importance of contextualization, verification, and scalability. Differences in landscape contexts (including conservancies versus community land areas) require that the framework be adaptable to local realities while maintaining standardized reporting structures. The emphasis on data verification, stakeholder mapping, and collaboration with technical institutions further reinforces the need for strong partnerships to support credible data collection. The planned piloting phase was identified as essential for testing practicality, refining tools, and ensuring that the framework is not only theoretically sound but also operationally feasible. Overall, the lessons point to the need for a pragmatic, flexible, and well-coordinated M&E system that bridges local data collection with national climate reporting systems.

Phase 5:

Piloting the NbS Monitoring and Evaluation Framework for the Chyulu Hills

Objective: *To assess the NbS landscape in the Chyulu Hills by identifying interventions and actors while testing the practicality of the NbS M&E Framework indicators to support policy development and guide projects in selecting context-appropriate measures.*

The pilot study in the Chyulu Hills landscape was essential for assessing whether the proposed indicators for monitoring NbS are practical, measurable, and relevant at the subnational level to ultimately support national reporting. Further, a key aspect of the pilot study was to function as a stakeholder engagement activity fostering early interaction with county extension officers, local administrators, and community leaders ensured smooth coordination and promoting ownership, given these actors are anticipated to carry out routine data collection once the tool is fully operational.

The study conducted in Kajiado South and Kibwezi East in Makueni County tested the feasibility of using the Household survey, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) tools to collect quality data in diverse ecosystems facing increasing climate pressures. The data gathering process relied heavily on strong partnerships with the county governments, local administrators, and community leaders. In addition to these immediate collaborations, the pilot also served as an early engagement platform with county extension officers, who are expected to take on routine data collection once the tool is fully operationalized.

Data Collection Methods Used



Household Surveys



Focus Group Discussions (4 sessions)



Key Informant Interviews(10 interviews)

In terms of operationalization, enumerators underwent training using both physical questionnaires and digital SurveyCTO platforms, enabling standardized household surveys and smooth coordination. Data was gathered on socio-economic characteristics, land and water management, nature-based enterprises, and climate impacts, complemented by four focus group discussions involving specific demographic groups (women, youth and the elderly), as well as ten key informant interviews with state agencies (Kenya Wildlife Services (KWS), Kenya Forest Research Institute (KEFRI), Kenya Forest Service (KFS), KALRO-Arid and Range Lands Research Institute), leading NGOs (WWF Kenya, IUCN, Big Life Foundation, Maasai Wilderness Carbon Trust), and community-based group (Pioneer Smart Environment – Makueni County)These activities also strengthened understanding of how communities being the primary implementers of NbS can better contribute as reliable data sources.

Insights from the pilot provided practical, context-specific inputs that will refine the monitoring and evaluation framework. For instance, communities shared existing experiences of shifting rainfall patterns, recurring droughts, water scarcity, and ecosystem degradation, along with examples of ongoing NbS initiatives that inform the adaptation of environmental and resilience indicators to reflect local realities.

It emerged that the importance of testing practicality and usability of indicators in real-world considering the complex landscapes is key. The Chyulu Hills pilot showed that indicators that appear robust in theory may face challenges in application across diverse socio-ecological systems involving protected areas, community lands, and agricultural zones.

The validation workshop further emphasized the need to simplify indicators, provide clear guidance to enumerators, and distinguish between data that can be collected at household level versus that requiring institutional or biophysical measurement. This highlights that effective NbS monitoring must balance scientific rigor with field-level feasibility.

A further lesson is the need for strong coordination and clearly defined roles across multiple actors and scales. The pilot demonstrated that NbS implementation and monitoring in landscapes like the Chyulu Hills require collaboration between national government, county authorities, local communities, and development partners. Validation discussions highlighted the importance of identifying data custodians, clarifying responsibilities, and aligning data flows across institutions. Without this coordination, there is a risk of fragmented data collection and inconsistent reporting, undermining the effectiveness of the framework.

The pilot also highlighted the importance of contextualization and landscape-specific adaptation. Differences between counties such as Kajiado (largely community rangelands) and Makueni (mixed farming systems) require that NbS interventions and indicators be flexible enough to capture local realities while still contributing to standardized national reporting. This reinforces that a one-size-fits-all approach to NbS monitoring is not viable. M&E frameworks must be adaptable to different ecological, social, and livelihood contexts.

Phase 6: Strengthening County Capacity for NbS Monitoring and Reporting

Objective: *To build county-level capacity to independently implement the NbS M&E framework, ensuring standardized, high-quality data collection aligned with national climate reporting.*

The final phase focused on technical capacity building for county staff stakeholders ensuring they were equipped to use the NbS M&E framework independently in the future. This phase targeted county-level stakeholders responsible for collecting, aggregating, and reporting data in alignment with national frameworks, including the National Climate Change Action Plan (NCCAP), Nationally Determined Contributions (NDCs), and Biennial Transparency Reports (BTRs). To ensure a, cross-sectoral approach, this phase engaged a wide array of institutions. At the county level, participants included representatives from the County Governments of Makueni, Kajiado, and Taita Taveta, spanning departments such as Environment, Climate Change and Natural Resources; Agriculture, Livestock, Fisheries & Cooperative Development; Water and Sanitation; and ICT. National and state agencies were represented by the State Department for Environment and Climate Change, the Ministry of Agriculture and Livestock Development (MoALD - State Departments for Agriculture and Livestock Development CCUs), the Kenya Forest Service (KFS), and the KALRO-Arid and Range Lands Research Institute. Furthermore, the capacity-building exercise integrated academic institutions, non-governmental actors, and technical partners, notably the University of Nairobi (UoN), IUCN, the Africa Centre for Climate Agri-food and Nature (AfriCCLAN), the Maasai Wilderness Conservation Trust, the Kenya Climate Smart Agriculture Multi-Stakeholder Platform (CSA-MSP), and software developers from Second Mile Limited. The training will provide stakeholders with practical skills for digital data management platforms (integrated with CSA-M&E and GHG tools), while reinforcing standardized protocols to ensure data quality and comparability.

Through strengthening the knowledge and competencies of local actors, the piloting and validation process demonstrated that practical operationalization of the NbS M&E framework depends on building local capacity, enabling county staff and implementers to serve as reliable, long-term custodians of data while translating NbS from policy ambition into measurable, on-the-ground impact.

Further it was noted that operationalizing monitoring systems is fundamentally about strengthening people, processes, and institutional systems not just designing technical tools. A central lesson is that capacity building is the foundation of both data quality and long-term sustainability. Training enumerators, extension officers, and community data collectors using both digital tools like SurveyCTO and structured field exercises such as role plays proved essential for ensuring consistent and reliable data collection. Without this investment in human capacity development and clear guidance on indicators, data quality is easily compromised. As a result, effective NbS monitoring depends on embedding skills within county systems so that local actors can serve as long-term custodians of data for national reporting commitments such as BTRs, NCCAP, and NDCs.

4. Challenges in Stakeholder Engagement

i. The Challenge of Multi-Stakeholder Engagement in NbS Framework Development

A major challenge was the complexity of coordinating diverse stakeholders across time and space. Stakeholders at national, county, and community levels operate under tight schedules, making it difficult to secure consistent participation in workshops and technical sessions. This was compounded by the geographic dispersion of actors across the Chyulu Hills landscape, increasing travel costs and time burdens. Additionally, ensuring balanced representation across government, NGOs, private sector, and communities required deliberate planning, as inclusivity while valuable added layers of logistical complexity.

ii. Challenges in Consensus-Building and Indicators Alignment

Developing a shared NbS M&E framework required navigating diverse stakeholder priorities, mandates, and expectations. Different institutions brought their own monitoring frameworks, making it difficult to agree on a core, standardized set of indicators. Tensions also emerged between designing a comprehensive framework versus a practical and implementable one, with concerns that too many indicators would undermine usability. Managing expectations was critical, as not all proposed indicators could be included due to alignment with national reporting requirements (such as NDCs). Furthermore, even terminology required negotiation, as technical terms needed to be both accurate and accessible.

iii. Technical Complexity and Accessibility Barriers

The framework needed to balance of technical rigor with usability for non-technical audiences, including community data collectors. Translating complex scientific indicators into clear, user-friendly language proved challenging. There was also a need to bridge the gap between scientific knowledge and local experiential knowledge, ensuring that indicators were meaningful and answerable at the community level. Additional complexity arose in distinguishing between drivers of degradation and NbS solutions (interventions), as stakeholders initially combined the two, reducing clarity and coherence in the framework.

iv. Institutional and Coordination Gaps

The presence of multiple actors with overlapping mandates and unclear roles created risks of duplication, inefficiencies, and gaps in implementation. A key issue was the lack of clarity around data ownership and custodianship, raising concerns about who is responsible for data collection, management, and reporting. This ambiguity directly affects sustainability. Moreover, policy misalignments between national and county levels, particularly in devolved sectors like agriculture, created tensions where economic priorities (such as land use) could conflict with conservation objectives.

v. Data and Methodological Limitations

The absence of a harmonized, standardized NbS M&E framework posed challenges, as existing frameworks (such as from IUCN, WWF) varied widely in scope and approach. This made integration and alignment difficult. Stakeholders also struggled to identify gaps without presence of data points such as actual data. Additionally, there was a need to balance biophysical indicators (long-term, slow to show results) with social indicators (short-term, real-time insights), ensuring that the framework could provide both immediate feedback and long-term impact measurement.

5. Lessons from Stakeholders Engagement in Developing and Operationalizing the NbS M&E Framework

i. M&E System Integration and Institutional Alignment

A central lesson is that effective NbS M&E frameworks should build on existing systems rather than create parallel structures. Aligning with government ratified platforms such as Climate-Smart Agriculture (CSA) M&E system enhances efficiency, reduces duplication, and ensures consistency with national and global Climate Action reporting frameworks (including the NDCs, NCCAP, BTRs). Embedding NbS monitoring within institutional processes also strengthens sustainability, as data collection and reporting become part of routine government functions rather than project-driven activities.

ii. Participatory Co-Design and Stakeholder Ownership

The various stakeholder's engagement processes highlighted the importance of multi-stakeholder co-design involving governments, researchers, NGOs, and communities. Iterative engagement and validation ensured that the framework reflects both policy priorities and on-the-ground realities. This participatory approach fosters ownership, strengthens coordination, and enhances the credibility and usability of the framework. Continuous consultation also allows refinement of indicators to better align with NbS challenges, interventions and stakeholder needs.

iii. Practical, Simplified, and Context-Specific Indicator System

A key lesson is the need to balance scientific rigor with practicality. Indicators must be simplified, clearly defined, and standardized to ensure usability across diverse stakeholders while maintaining comparability. Avoiding indicator overload is critical where the NbS M&E framework should prioritize a manageable set of metrics aligned with existing M&E systems responding to Climate Action needs. Additionally, clear differentiation between drivers of unsustainable agricultural practices, biodiversity loss and ecosystem degradation and NbS interventions is essential to ensure meaningful and actionable reporting to Climate Action.

iv. Capacity Building as the Foundation for NbS M&E Framework Sustainability

Capacity development emerged as a cornerstone of effective and sustainable NbS monitoring. Training enumerators, extension officers, and community actors using both digital tools (including SurveyCTO) and practical exercises ensures consistency and reliability in data collection. Embedding these skills within local institutions including the CSA-MSP transforms the framework into an operational system, with county actors serving as long-term data custodians. Ultimately, strengthening people and systems is as important as designing the framework itself.

v. Multi-Dimensional Monitoring: Integrating Socio-Economic and Environmental Indicators and Metrics

NbS M&E frameworks must go beyond biophysical indicators to include socio-economic, governance, and financing dimensions. Factors such as land tenure, gender dynamics, and economic incentives are critical for understanding adoption and sustainability of NbS interventions. Positioning M&E as a tool to demonstrate impact also strengthens the case for climate finance by providing credible evidence of benefits.

vi. Strong Coordination, Defined Roles, and Data Governance

Effective implementation of the NbS M&E framework depends on clear roles, responsibilities, and data custodianship across actors and scales. NbS monitoring requires coordinated efforts between national institutions, county governments, communities, and development partners. Clearly defined data flows and responsibilities prevent fragmentation and ensure consistent reporting. Strong coordination mechanisms are therefore essential for both functionality and long-term sustainability.

vii. Importance of Piloting and Validation

Piloting played a critical role in ensuring that the NbS M&E framework is practical, usable, and grounded in actual context conditions. The Chyulu Hills experience demonstrated that indicators that appear robust in theory may face challenges in application (implementation). Testing in diverse landscape of Chyullu enabled refinement of indicators, tools, and methodologies before full-scale implementation, ensuring that the framework is both scientifically sound and operationally feasible.

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