

# PROGRAM FOR CLIMATE-SMART TIKUNA AGRICULTURE

By: Environmental Women ORG



## PROGRAM FOR CLIMATE-SMART TIKUNA AGRICULTURE

*Under Tikuna Indigenous techniques, uses, customs, and community governance*

Issued by: Environmental Women ORG

Beneficiaries: Tikuna Indigenous Reserve

Territory: 10,325 ha of humid tropical forest, Colombian Amazon basin



## DOCUMENT STRUCTURE

This document presents a general sponsor-facing program for supporting climate-smart, regenerative agriculture under Tikuna Indigenous uses and customs in the Colombian Amazon basin. It is organized as a practical framework for technical implementation, education, sustainability, communication, and accountable sponsorship. Each section can also be used independently in concept notes, donor briefs, grant inquiries, or partnership conversations.

Section	Purpose
1. Executive Program Statement	Define the program rationale and sponsor-facing value.
2. Territorial and Climate Context	Explain the climate and agricultural problem in the reserve.
3. Goal, Population, and Theory of Change	Clarify causal logic and expected change.
4. Raised Beds and Flood Adaptation	Detail the technical response to prolonged flooding.
5. Erosion Control and Soil Recovery	Detail living barriers, contour logic, compost, and cover.
6. Agroforestry Diversification and Seeds	Explain crop diversification and the native seed bank.
7. Educational Strategy	Describe field schools and capacity transfer.
8. Indigenous Governance	Define the Tikuna Secretariat and community management.
9. Digital and AI Support	Describe low-cost digital agricultural assistance.
10. Sustainability and Communication	Explain continuity, sponsor value, and visibility.

## 1. Executive Program Statement

Environmental Women ORG issues this General Program for Climate-Smart Tikuna Agriculture as a sponsor-facing framework for strengthening Indigenous food systems in the Colombian Amazon basin. The beneficiaries are Tikuna families living in a 10,325-hectare humid tropical forest territory where agriculture is not only an economic activity, but also a foundation of food autonomy, territorial stewardship, and intergenerational knowledge. The program responds to a concrete failure point: climate behavior has changed faster than the local agricultural system has been able to adapt. Heavy rainfall, flooding, erosive runoff, and concentrated drought are now damaging staple crops and reducing the food available inside the reserve.

Our program is designed as a practical agricultural adaptation package under Tikuna techniques, uses, and customs, validated by Indigenous authorities and implemented through family plots, community governance, and women-led field learning. We do not frame the territory as a passive recipient of aid. Tikuna families already hold agricultural knowledge, ecological memory, and community rules for land use. The program adds climate-smart regenerative tools to that foundation: raised beds for flood tolerance, living barriers for erosion control, organic soil cover for moisture regulation, diversified agroforestry modules for production stability, and a native seed bank for continuity across seasons.

The operational target is 300 farming families, with one woman-led production unit per family. Each family receives a complete adaptation module rather than isolated inputs. The model includes three raised beds, two living barriers, organic cover, one family composter, diversified planting material, participation in field schools, and access to a community seed system. The program also creates a Tikuna Secretariat for Adaptive Agriculture to coordinate local

monitoring, seed exchange, replication, and technical decisions with the Indigenous Council.

For sponsors, this is a high-clarity investment. The program converts funding into measurable physical units: 900 raised beds, 600 living barriers, 12,000 linear meters of soil protection, 300 composters, 300 diversified family modules, 20 conserved seed varieties, 12 farmer field schools, and at least 210 families applying three adaptive practices during the project period. The expected effect is a 25% reduction in crop loss within participating units, compared with the current community estimate of 66% annual losses.



The value of the program is its integrated architecture. Food access, land stewardship, Indigenous governance, women's leadership, soil recovery, and climate adaptation are treated as one production system. This makes the intervention technically coherent, culturally appropriate, and suitable for replication in other Amazonian communities facing similar hydrological stress.

This document can be used as a general program umbrella or as the basis for individual grant proposals. Its strongest advantage is operational clarity. A sponsor can see the number of families, the number of field units, the agricultural practices, the governance mechanism, and the monitoring approach before funds are disbursed. The program is therefore not a general promise to support agriculture; it is a structured adaptation model for a defined Indigenous territory, with measurable

units and a clear pathway from climate stress to field-level response.

The section will be operationalized through written field records, community validation, and sponsor-ready evidence. This ensures that the *Program at a glance*

program remains understandable to external partners while staying anchored in local decision-making, practical agricultural work, and the concrete reduction of crop loss under climate stress, securely.

Element	Operational definition	Sponsor relevance
Program issuer	Environmental Women ORG	Responsible implementation, fiduciary management, and reporting.
Beneficiaries	Tikuna Indigenous Reserve, 300 farming families	Direct community farming and food security focus.
Territory	10,325 ha of humid tropical forest	Amazon basin landscape with climate-sensitive production.
Core model	Climate-smart regenerative agroforestry	Adaptation through soil, water, seeds, and local governance.

## 2. Territorial and Climate Context

The Tikuna Indigenous Reserve in the Colombian Amazon basin is a humid tropical forest landscape where food production depends on the stability of water, soil, forest cover, and family labor. The program works across a 10,325-hectare reference area, with nearly 5,000 inhabitants and approximately 300 families maintaining regular agricultural production. These families are the productive backbone of local food access. When their crops fail, the effect is not limited to household income; it affects daily nutrition, seed continuity, community exchange, and the ability of the reserve to feed itself under its own territorial rules.

The climate pattern affecting the reserve is structurally adverse for conventional field management. The community reports approximately nine months of intense rainfall and flooding, followed by three months of drought. This cycle saturates root zones, accelerates runoff,

opens erosion channels, and then leaves crops exposed to water deficit. Staple crops such as plantain, pineapple, beans, and watermelon are highly sensitive to these oscillations. The current estimate of crop loss is 66% per year, with losses reaching up to 95% in the most exposed plots.

From an agricultural engineering perspective, the core problem is hydrological instability at plot level. Excess water during prolonged rainfall produces root stress, nutrient leaching, compaction, and disease pressure. Concentrated drought then reduces moisture availability, weakens seedlings, and lowers the survival of crops that already entered the dry period under stress. The soil is not simply wet or dry; it is forced through repeated cycles of saturation, erosion, exposure, and scarcity. The productive system needs to be redesigned for that reality.

The erosion process is particularly damaging. Community reports describe channels reaching up to one meter in depth. Such erosion removes fertile soil horizons, cuts across planting areas, destabilizes parcel borders, and damages

surrounding vegetation. Once this happens, the plot loses more than current yield. It loses its capacity to retain water, host roots, recycle organic matter, and recover after the next rainy season.

The program therefore treats climate adaptation as a field design issue, not a general awareness issue. It aims to modify the physical conditions of production: raising planting surfaces above saturation zones, slowing runoff, keeping soil covered, restoring organic matter, diversifying crop structure, and protecting native seeds. This approach respects Tikuna agricultural knowledge while adding technical responses to an abnormal climate regime that is now shaping food insecurity.

This context also has a public policy dimension. Food security, climate adaptation, Indigenous governance, and ecosystem conservation are

*Problem chain and program response*

Climate pressure	Agricultural effect	Program response
Nine months of rainfall and flooding	Root stress and crop loss	Raised beds and drainage logic
Runoff and erosion channels	Loss of fertile soil	Living barriers and contour lines
Three months of drought	Moisture deficit and crop stress	Organic cover and compost
Dependence on few crops	High risk of total loss	Diversified agroforestry modules

**3. Program Goal, Population, and Theory of Change**

The general goal is to reduce climate-driven crop loss among 300 Tikuna farming families by implementing an Indigenous Model of Climate-Smart Regenerative Agroforestry adapted to flooding, erosion, and drought. The program focuses on two variables that directly respond to the problem: crop survival and community adoption of adaptive agroforestry practices. These variables are sufficient to keep the intervention disciplined. If crops survive better and families apply the model without permanent external

usually managed through separate institutional channels. In the reserve, those issues converge in the same plot. A damaged crop is also a nutrition issue, a household economy issue, a territorial autonomy issue, and a climate resilience issue. The program is designed to make that convergence manageable through one integrated agricultural model rather than through disconnected activities.

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assistance, the program creates a measurable pathway toward food autonomy.

The direct beneficiary unit is the farming family. The operational lead within each family is the woman responsible for crop care, because women are central to daily agricultural maintenance, seed selection, household food decisions, and intergenerational transmission of practice. The program does not inflate beneficiary numbers by treating every activity as a separate population. It works with 300 families and organizes implementation through one module per family, supported by Tikuna authorities, elders, community volunteers, and Environmental Women ORG.



The theory of change is direct. If 300 families install climate-adapted agroforestry modules that include raised beds, living barriers, organic cover, diversified crops, compost, and native seeds, then plots become less exposed to flooding, erosion, and drought stress. If those same families are trained through field schools and supported by a Tikuna Secretariat for Adaptive Agriculture, then the model becomes locally managed rather than externally delivered. If local monitoring records crop survival, seed use, and replication, then sponsors can verify both technical performance and community ownership.

This logic avoids the weak assumption that training alone produces change. The program combines infrastructure at plot scale, ecosystem-based techniques, Indigenous governance, and practical learning. The first change happens in the field: root zones are elevated, runoff is slowed, soil is covered, seeds are stored, and crop diversity increases. The second change happens in the community system: families learn to maintain the *Theory of change scheme*

modules, measure crop condition, and adjust decisions according to rainfall, flooding, and drought.

The expected result during the project period is a minimum 25% reduction in crop losses in participating production units, moving from a 66% loss pattern to a maximum of 49.5% in the intervened cycle. At least 210 of the 300 families are expected to adopt and replicate three adaptive practices. This level of performance is realistic because the model uses low-cost materials, local labor, and productive techniques compatible with community farming.

The program does not measure success only by counting installations. Installations are necessary, but the decisive test is whether families continue using the practices during the agricultural cycle. For this reason, each output is linked to a field behavior: raised beds must remain planted, barriers must remain alive, compost must be applied, seeds must circulate, and families must record crop status. This is the practical difference between delivering materials and building adaptive capacity.

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Cause	Field mechanism	Direct result
Climate-driven crop failure	Raised beds, soil cover, seed system	Higher survival of staple crops
Erosion and soil loss	Living barriers and contour lines	More stable productive plots
Limited adaptive capacity	Field schools and protocols	Families apply practices autonomously

Weak continuity mechanisms	Tikuna Secretariat	Community monitoring and replication
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#### 4. Technical Strategy: Raised Beds and Flood Adaptation

The first technical strategy is the construction of raised agroforestry beds. This is the most immediate response to prolonged flooding because it changes the elevation and drainage behavior of the planting area. In flooded or saturated soils, roots suffer from oxygen limitation, disease pressure, nutrient leaching, and delayed growth. A raised bed does not eliminate flooding from the landscape, but it gives the plant a higher and better-structured root zone, allowing cultivation to continue under conditions that currently destroy a large share of the harvest.

The program will build 900 raised beds, three per family, in 300 Tikuna production units. Each bed will measure approximately 1.20 meters wide by 10 meters long, with a minimum height of 40 to 60 centimeters. This produces 10,800 square meters of adapted productive area. The beds will be located in plots with a history of waterlogging, poor root survival, or crop failure during the rainy months. The design is intentionally simple because the model must be maintained by families with available tools and local labor.

The raised beds will be used for the priority crops of the program: plantain, pineapple, beans, and watermelon, combined with agroforestry support species where plot conditions allow. Planting will not be random. Each family will receive guidance on placement, spacing, soil preparation, organic cover, and drainage continuity. The bed surface will be enriched with compost and mulch to reduce compaction and improve moisture retention after the rainy period. Side slopes will be stabilized with vegetation or organic material to avoid collapse.

The implementation method is family-based. Environmental Women ORG provides

coordination and field guidance; Tikuna community volunteers support installation; the Indigenous Council validates participant selection and work days; the University of Magdalena supports measurement criteria. Each family contributes labor and local materials where possible, which reduces cost and increases ownership. The project avoids high-maintenance infrastructure that cannot be replicated without external contractors.



The verification system is physical and straightforward. Each bed will be recorded through installation forms, measurements, photographic evidence, and crop survival counts. Monthly monitoring will identify which crops remain productive, which beds need correction, and which design details work best in specific micro-sites. This is important for sponsors because it transforms an agricultural adaptation concept into an accountable unit: one bed can be measured, inspected, maintained, and replicated.

Raised beds are not the full solution; they are the foundation. They protect roots from prolonged saturation and create the physical platform on which soil recovery, diversified planting, compost use, and seed protection can operate.

The program will also document technical adjustments made during implementation. In

humid tropical conditions, one standard design rarely works perfectly across all micro-sites. Bed height, side stabilization, planting density, and cover thickness may require small adaptations according to soil texture, water retention, and family labor. These adjustments will be recorded by the Secretariat and technical team so that the final model is not theoretical, but derived from field performance inside the Tikuna territory.

*Raised bed design parameters*

Parameter	Program value	Verification
Number of beds	900 total; 3 per family	Installation records and physical measurement
Approximate size	1.20 m x 10 m	Field measurement and photos
Height	40-60 cm minimum	Monthly technical review
Adapted area	10,800 m <sup>2</sup>	Consolidated parcel inventory

**5. Technical Strategy: Erosion Control and Soil Recovery**

The second technical strategy addresses erosion, which is one of the most damaging effects of intense rainfall in the reserve. When runoff cuts channels through a parcel, it removes the soil fraction that supports roots, nutrients, biological activity, and water retention. In the Tikuna context, erosion has been reported in channels up to one meter deep. This is a serious agricultural and ecological loss. A crop can be replanted after a bad season, but soil structure takes much longer to recover.

The program will establish 600 living barriers along contour lines, equivalent to 12,000 linear meters of soil protection. Each family will install two barriers of approximately 20 meters. These barriers will be placed along plot edges, runoff routes, slope transitions, and eroded sections where rainfall concentrates flow. Their function is to slow water, retain sediment, stabilize borders,

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and reduce the velocity of surface runoff before it becomes destructive.

Living barriers are selected because they are consistent with ecosystem-based adaptation. They use vegetation to perform an engineering function. Instead of relying on concrete channels or external materials, the program uses rooted plants, local species, and field layout to protect productive land. Species selection will be validated with Tikuna authorities and local knowledge holders, prioritizing plants with rapid rooting, low invasiveness, usefulness to the community, and compatibility with humid tropical conditions.

Soil recovery also requires organic matter. For that reason, each family will establish one composter of at least one cubic meter, for a total of 300 family composters. The program will produce at least 300 cubic meters of organic fertilizer during the agricultural cycle. This material will be applied to raised beds and agroforestry modules with plant cover, leaf litter, clean residues, and local mulch. The purpose is to improve soil structure, moisture retention, microbial activity, and fertility without

increasing dependence on external chemical inputs.

The methodology combines layout, installation, and monitoring. The University of Magdalena will support basic contour guidance and stability criteria. Community volunteers and trained families will install barriers and composters. Environmental Women ORG will coordinate documentation. The Tikuna Secretariat for Adaptive Agriculture will monitor maintenance and record which barriers remain active after rainfall.

The main variable for sponsors is visible soil stabilization. The outputs are concrete: 12,000 meters of barriers, 300 composters, 300 cubic meters of organic fertilizer, and 300 family plots applying organic soil cover. These are not symbolic actions. They directly respond to erosion, water stress, and declining productivity, while remaining affordable and locally manageable.

*Soil recovery package*

Component	Quantity	Immediate agricultural function
Living barriers	600 barriers / 12,000 linear meters	Reduce runoff and retain soil
Family composters	300 units of at least 1 m3	Produce organic fertilizer
Organic cover	Applied to 900 beds	Protect moisture and soil structure
Monitoring	Monthly and quarterly reviews	Measure maintenance and soil stability

This component is also important for long-term restoration of production capacity. If soil loss continues unchecked, future investments in seed, training, or planting material will have weak returns. The barriers and composters protect the agricultural base before expanding production. That sequence is deliberate: first we stabilize the plot, then we improve soil condition, and then we consolidate diversified production. This order reduces waste and makes the grant investment more efficient.

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**6. Agroforestry Diversification and Native Seed System**

The third technical strategy is diversification. A production system concentrated in few crops becomes highly vulnerable when climate conditions change. In the Tikuna reserve, plantain,

pineapple, beans, and watermelon are priority crops for household consumption and community exchange, but their survival is affected by prolonged rain, flooding, erosion, and drought. The program therefore diversifies each family plot without abandoning the staple crops that families already know and use.



Each participating family will establish one diversified agroforestry module, for a total of 300 modules. Each module will include at least four staple crops and two native or useful species selected with Tikuna knowledge holders. The purpose is to distribute risk across different crop structures, root depths, growth cycles, and uses. The module combines food production with ecological functions: shade regulation, soil cover, nutrient cycling, habitat support, and microclimate buffering.

The design follows agroforestry principles. Crops and useful species are organized by strata and function rather than planted as a single crop block. Plantain can provide structure and shade; pineapple can occupy intermediate spaces; beans can contribute ground-level productivity; watermelon can use defined areas where drainage and cover are appropriate. Native or useful species will be selected according to local suitability, cultural relevance, seed availability, and ecological behavior. The specific species list will be validated before implementation to avoid imposing external materials that do not fit Tikuna practice.

A community seed bank will support this diversification. The program will establish one central seed point and four satellite collection boxes. At least 20 local or native varieties will be

### *Diversification and seed system*

registered, stored, exchanged, and monitored for viability. Each family will contribute or receive at least two seed lots, creating a minimum movement of 600 family seed lots during the program period. This system protects genetic continuity and reduces dependence on external seed purchases.

The seed bank is also a governance tool. It requires rules for registration, loan, return, storage, replacement, and community access. The Tikuna Secretariat for Adaptive Agriculture will manage the system with guidance from elders and women farmers. This approach respects the fact that seed is not only an input; it is part of cultural memory, food preference, adaptation capacity, and local autonomy.

For sponsors, the combined output is clear: 300 diversified modules and 20 conserved varieties. The expected field effect is reduced vulnerability to total crop loss and a stronger local food base. The seed system gives the program continuity beyond the grant period because families can replant, exchange, and improve their modules without waiting for external procurement.

The seed system also strengthens community resilience during supply disruptions. If floods, transport costs, or market shortages affect external seed access, the reserve needs local seed reserves that are known, viable, and governed by community rules. The bank will not be a storage room alone; it will be a managed circulation system. Families will know which seeds are available, where they came from, who used them, and how replacement will be organized.

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Unit	Target	Function
Family modules	300	Diversify food production and reduce total loss risk
Staple crops	4 per module	Maintain household food relevance
Native/useful species	2 per module minimum	Strengthen ecosystem functions and cultural fit
Seed bank	20 varieties	Maintain local seed availability and continuity

### 7. Educational Strategy: Tikuna Farmer Field Schools

The educational strategy is based on Tikuna Farmer Field Schools, not classroom-style training detached from the field. The program will train 300 farming families through 12 practical field schools organized in six groups of 50 families. Each group will work directly on demonstration plots and family modules. The objective is to ensure that families can build, maintain, monitor, and replicate the adaptation package with their own hands, tools, and decision-making structures. The content is organized around the actual failure points in the production system. Families will learn how to build and maintain raised beds for flooded conditions, install living barriers along runoff lines, apply organic soil cover, manage compost, diversify crops, select and conserve seeds, register crop survival, and adjust field decisions during rainfall and drought. Each module links a technical action to a climate stress. This keeps the training practical and avoids generic climate education.



Each participating family must implement or replicate at least three adaptive practices. The operational target is that at least 210 families, equivalent to 70% of the direct beneficiary group, complete the practical learning route and demonstrate adoption in their plots. Adoption will be measured through attendance, field assessment, family records, and technical visits. The key indicator is not how many people listen to a

workshop; it is how many families apply practices that reduce crop loss.

The methodology recognizes different forms of knowledge. Environmental Women ORG coordinates the curriculum and logistics. Tikuna elders and authorities validate cultural compatibility and local practices. Women farmers demonstrate crop care and seed management. The University of Magdalena supports evaluation tools and evidence collection. Community volunteers help organize sessions, field materials, and household follow-up. This structure allows formal technical knowledge and Indigenous agricultural practice to work together.

The field schools also build a peer-to-peer extension network. Families that apply the practices earlier become local references for families that need correction or reinforcement. This matters because agricultural change in Indigenous territories is more sustainable when it is observed in nearby plots and discussed through community trust. The program will use demonstration days, family practice records, and small group visits to ensure that learning does not stop after the training session.

The educational strategy is therefore a productivity strategy. It gives families the technical autonomy

*Field school curriculum structure*

Module	Practical content	Expected evidence
Flood adaptation	Raised beds and root protection	Beds measured and planted
Erosion control	Living barriers and contour logic	Barriers installed and maintained
Soil recovery	Compost and organic cover	Compost records and soil cover checks
Adaptive management	Monthly crop monitoring	Family records and field visits

to maintain raised beds, repair barriers, manage organic matter, keep seed records, and interpret crop survival data. Sponsors can verify the process through 12 field school records, attendance lists, applied assessments, 300 family monitoring forms, and documented adoption in at least 210 plots.

The field schools will use simple technical language and visible demonstrations. A family should leave each session knowing exactly what to do in its own plot: how high to build a bed, where to place a barrier, how to layer organic cover, how to identify crop stress, and how to record plant survival. This level of specificity is necessary because adaptation is not achieved by changing discourse; it is achieved by changing repeated agricultural decisions.

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## 8. Indigenous Governance and Community Management

The governance strategy is built around Tikuna authority, community legitimacy, and operational accountability. The program is issued by Environmental Women ORG, but it is not designed as an external intervention imposed on the reserve. The Tikuna Indigenous Council is the central partner for territorial authorization, participant selection, cultural validation, and integration of results into local decision-making. This is essential because agriculture in Indigenous territory is linked to land use, family roles, food customs, environmental rules, and collective authority.



The program will create a Tikuna Secretariat for Adaptive Agriculture. This will be a 15-member community management structure composed of women farmers, youth monitors, representatives of the Indigenous Council, and knowledge holders with direct responsibility for agriculture or local governance. The Secretariat will coordinate

monthly monitoring of the 300 family modules, seed bank management, crop loss records, protocol validation, and replication decisions. Its role is operational, not symbolic.

A short internal regulation will define functions, meeting frequency, decision rules, responsibilities, and reporting practices. The Secretariat will produce 12 monthly minutes, maintain 300 family monitoring forms, supervise seed bank records, and organize correction visits when modules show weak performance. It will also help determine which practices can be scaled within the 10,325-hectare territory after the initial project cycle.

Women's leadership is treated as part of production governance. Each of the 300 participating families will identify a woman agricultural lead for the module. This does not exclude men or youth; it recognizes that women are often responsible for daily crop care, food preparation decisions, seed handling, and continuity of household farming. The program therefore places women where the technical decisions are made: soil cover, seed selection, planting timing, crop survival records, and maintenance of productive units.

Youth participation is also functional. Youth monitors can support digital records, photographs, simple georeferencing, and use of the AI-assisted tool. This creates a practical bridge between Indigenous agricultural knowledge and low-cost digital monitoring. Elders provide criteria on local uses, seed relevance, and cultural acceptability. The governance model is intergenerational by design.

Sponsors should read this as a risk management mechanism. Many agricultural projects fail because they fund inputs without local administration. This program creates a community structure that monitors assets, verifies practices, maintains records, and supports replication. The governance output is one Secretariat with 15 trained members, 12 months of operation, and verified responsibility over 300 modules.

This governance design also protects cultural appropriateness. Any external technical recommendation must pass through local validation before becoming part of the protocol. If a proposed species, planting arrangement, digital record, or communication product conflicts with Tikuna uses and customs, it will be revised. The program therefore treats Indigenous governance as a technical requirement for quality implementation, not as a ceremonial step attached to the project.

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*Community governance structure*

Actor	Role	Accountability product
Tikuna Indigenous Council	Territorial authorization and legitimacy	Acts and community validation
Women agricultural leads	Daily module management	Family monitoring forms
Youth monitors	Digital records and field documentation	Photos, app records, georeferencing
Elders/knowledge holders	Cultural validation of practices and seeds	Protocol review and seed criteria

**9. Digital and AI-Assisted Agricultural Support**

The program includes a low-cost AI-assisted agricultural support tool because field information must be converted into decisions. The tool is not presented as an expensive technology platform or as a replacement for Tikuna knowledge. It is an extension instrument that organizes crop records, climate stress observations, technical protocols, and locally validated recommendations into a format that families and monitors can use during the project period.

The tool will operate as a lightweight mobile web application, offline form, or WhatsApp-compatible system depending on connectivity conditions. It will register 300 families, 900 raised beds, 600 living barriers, the community seed

bank, crop types, planting dates, monthly crop status, and basic alerts related to flooding, drought, soil cover, and maintenance. The target is monthly active use by at least 210 families, supported by 25 trained community monitors.

The AI component will be constrained and practical. It will not make autonomous decisions over the territory. It will generate simple recommendations based on the project’s technical protocol and Tikuna uses validated by elders and authorities. For example, when a family records waterlogging in a bed, the tool can remind them to check drainage, reinforce bed sides, renew organic cover, and report survival counts. When drought stress is recorded, it can suggest mulch reinforcement, watering priorities where feasible, and compost application timing.

Data protection and cultural control are central. The Tikuna Secretariat and Indigenous Council

will define what information is collected, who can access it, and how it is used for reporting. Personal data will be minimal. The main records will be agricultural: modules, practices applied, seed lots, crop status, and maintenance needs. The program will avoid collecting sensitive cultural information unless authorities explicitly approve it for community use.

The digital strategy improves sponsor accountability. Instead of relying only on final reports, the program can produce monthly summaries: number of active modules, beds installed, barriers maintained, families using practices, seed exchanges, and crop survival observations. This makes monitoring cheaper, faster, and more transparent. It also helps community leaders detect failure early and correct it during the project rather than after the harvest is lost.

The tool is designed for continuity. If internet access is weak, paper forms and offline records remain valid. Digitalization follows the community process; it does not force the process

*Digital support logic*

Function	Data captured	Use
Crop monitoring	Monthly status of crops and beds	Early correction of field problems
Seed system	Seed lots and exchanges	Seed availability and continuity
Erosion and flood alerts	Barrier and bed condition	Maintenance priorities
Sponsor reporting	Aggregated progress data	Transparent evidence and accountability

**10. Sustainability, Communication, and Sponsor Value**

The sustainability strategy is based on low-cost maintenance, local governance, seed continuity, and practical knowledge transfer. The program does not depend on heavy infrastructure,

to follow the technology. The expected output is one operational AI-assisted tool with records for 300 families and active monthly use by 210 families.

The tool will also help build a practical data culture. Families and community monitors will be able to compare practices across plots and identify which combinations perform better under flooding or drought. This information can support future negotiations with sponsors or public institutions because the community will have its own evidence. The goal is not to extract data from the territory, but to return useful information to the families making agricultural decisions.

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specialized machinery, or permanent external consultants. Its core assets are family-managed modules, living barriers, organic soil practices, local seeds, field schools, and a Tikuna Secretariat that remains in the territory after the grant period. This makes the model technically durable and financially realistic.

Maintenance costs are intentionally modest. Raised beds can be repaired with family labor and local soil management. Living barriers can be replanted or reinforced with community material. Composters use household and agricultural residues. Organic cover uses local biomass. Seeds are conserved and exchanged through the community bank. The AI-assisted tool reduces monitoring costs by allowing local records and summarized reporting. These features make the program suitable for sponsor investment because each funded unit remains useful beyond the initial purchase or installation.

The program’s sustainability also depends on institutional integration. The Tikuna Indigenous Council and the Secretariat for Adaptive Agriculture will review results and define how the model is incorporated into local food security discussions, environmental decisions, and community protocols. The University of Magdalena will support a technical policy brief that translates field results into recommendations for Indigenous authorities, environmental institutions, food security actors, universities, and climate adaptation programs. This creates a bridge between community evidence and public or philanthropic replication.

The communication strategy will be precise and respectful. It will not expose families as victims or use Indigenous identity as decoration. Communication will focus on field evidence: beds built, barriers installed, seeds conserved, families trained, modules operating, and crop survival improvements. Materials will include a sponsor brief, photo documentation approved by the community, monthly progress summaries, a short field story series, and a final technical report. All public communication will be coordinated with the

Tikuna authorities and Environmental Women ORG.

For sponsors, the value proposition is clear. A contribution supports regenerative food access, women-led community farming, Indigenous land stewardship, climate adaptation, and measurable agricultural recovery in the Amazon basin. The program converts resources into concrete outputs: 900 beds, 12,000 meters of barriers, 300 composters, 300 diversified modules, 20 seed varieties, 12 field schools, one Secretariat, one digital tool, and at least 210 adopting families.

The scale is intentionally disciplined. We are not claiming to transform all Amazonian agriculture through one grant. We are proposing a replicable Tikuna model that proves how an Indigenous community can adapt staple food production to flooding, erosion, and drought using regenerative agroforestry, local governance, and practical technical support.

The sponsor relationship will be handled as a partnership in measurable adaptation. Environmental Women ORG will provide concise reporting, field evidence, financial accountability, and clear recognition according to each sponsor’s visibility rules. At the same time, the dignity and decision-making authority of the Tikuna community will remain central. Communication will show results without exposing private household conditions or reducing Indigenous families to images of vulnerability.

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*Sponsor-facing communication products*

Product	Frequency	Purpose
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Monthly progress note	Monthly	Track physical outputs and adoption
Field photo package	Quarterly	Show evidence of implementation
Sponsor brief	Midterm and final	Summarize results for partners
Final technical report	End of program	Document model and replication pathway