Agroecological TRANSITIONS Programme

# Using digital tools for a sustainable transition in small-scale livestock farming in Brazil

Results from workshops with local action partners

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**Photos**

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## About the authors

Solidaridad is an international civil society organization that has been working in Brazil for 15 years to develop socially inclusive, environmentally responsible and economically profitable agricultural value chains. It seeks to accelerate the transition to inclusive low-carbon production, contributing to food and climate security in the country and around the world. It is currently developing sustainability initiatives with its partners in the following supply chains: cocoa, coffee, sugar cane, yerba mate, oranges, livestock and soy. Globally, Solidaridad has been active in more than 40 countries for more than half a century.

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- Veterinary Diagnostic Center (CEDVET)
- SICREDI
- Institute for Forest Development and Biodiversity of Pará State (Ideflor-bio)
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- Center for Life Institute (ICV)
- Campo S/A

# Contents

## Introduction

This report summarizes the results of three workshops about the use of digital tools to support the sustainable transition of family livestock farming in Brazil, organized by Solidaridad in November 2024 in the context of the Inclusive Digital Tools (ATDT) project. The Inclusive Digital Tools Project (ATDT) aims to make digital technologies accessible to all, to integrate resilience and climate change mitigation with agroecological objectives and train farmers to develop new practices. It is an initiative of the Agroecological Transitions Program for Building Resilient and Inclusive Agricultural & Food Systems (TRANSITIONS), funded by the European Union through its DeSIRA initiative and managed by the International Fund for Agricultural Development (IFAD). The TRANSITIONS program seeks to support large-scale agroecological transitions through the development and adoption of multidimensional performance indicators for food and agricultural systems, inclusive digital tools, incentives and public and private sector investments for food systems.

Solidaridad has been working in the South of Pará, along the Transamazonian highway for over 10 years, supporting rural families in the adoption of better production practices with the objective of boosting family income while reducing carbon emissions and deforestation. As part of the ATDT project, Solidaridad conducted a highly collaborative co-creation process involving over 90 extension staff, farmers, and IT developers that resulted in the development of a mobile application called Solis.

Launched publicly in October 2024, this innovative tool replicates social media mechanisms to enable farmers and extensionists to continuously engage in the co-creation of knowledge, providing them with the opportunity to share their own experiences and insights. With a simple and intuitive interface, Solis allows users to publish videos—whether produced by themselves or shared from other social networks—on techniques, experiences, and knowledge related to agricultural production, thereby fostering an interactive environment for the generation and dissemination of local knowledge. As an open application available to any user with the Android operating system, Solis can also be accessed by other stakeholders interested in exchanging knowledge and techniques for more sustainable agricultural production. In this way, Solis serves as a valuable tool for promoting the ongoing exchange of information among small producers, researchers, policymakers, decision-makers, market agents, expand

outreach of technical assistance, and support the transition from a traditional bottom-up approach to a more interactive, two-way communication model with farmers.

In addition to the development of Solis, the ATDT project also resulted in the publication of a comprehensive training curriculum for sustainable livestock production. This curriculum outlines the methodology for co-creating locally relevant practices with farmers, extension staff, and experts, drawing on insights from its application in the Transamazon region. It includes a detailed overview of Solis, as well as practical guidance on using the platform to disseminate information about sustainable livestock farming practices.

Following the launch of Solis and the publication of the curriculum, Solidaridad organized three workshops with key stakeholders in the livestock value chain at the municipal level in Novo Repartimento and at the state level in Pará and Mato Grosso. The workshops aimed to discuss how digital tools can support and accelerate the transition to a sustainable livestock production model, as well as gather suggestions from participants to make the Sustainability Curriculum and the Solis app useful and relevant in their local context. Attendees included representatives from municipal and state environmental and agricultural secretariats, farmer organizations, NGOs, private sector entities, and academic institutions.

The objective of this report is to document and share key contributions from these stakeholders, with the hope that this will facilitate the adoption of the curriculum in other regions for the co-creation of relevant sustainable and agroecological practices tailored to the local context, as well as promote the use of Solis as a channel for the dissemination and sharing of knowledge about sustainable practices.

# 1. CONTRIBUTIONS FROM LOCAL STAKEHOLDERS IN NOVO REPARTIMENTO – PARÁ

In Novo Repartimento, the workshop brought together representatives from two federal universities: the Federal University of Pará (UFPA) and the Federal University of South and Southeast of Pará (UNIFESSPA), along with a technical agricultural school. From the public sector, representatives from the Municipal Secretariat of the Environment (SEMMA) and the Municipal Secretariat of Agriculture (SEMEAR) participated, as well as employees from the municipal public company for technical assistance and rural extension (EMATER – Novo Repartimento) and the State Agency for Agricultural Defense of Pará (ADEPARÁ). The event also had the participation of representatives of rural workers, represented by the Union of Workers in Family Agriculture of Novo Repartimento (SINTRAF), and farmers, through the Cooperative of Rural Producers of Maracajá (COOPERMAR). The private sector was also present, represented by the Veterinary Diagnostic Center (CEDVET) and employees from SICREDI, a credit cooperative.

During the discussion, participants contributed additional suggestions of practices to be incorporated. In addition to productive practices, the group suggested broader actions aimed at strengthening the livestock sector as a whole.

These contributions were organized into two main categories: demands for the sustainable development of the livestock chain and production practices. This categorization reflects both the origin of the suggestions and the expected level of application, highlighting the specific research needs, local implementation, and sectoral articulation.

### *1.1. Practices suggested by Key Actors from Novo Repartimento*

Demands for Sustainable Development of the Livestock Supply Chain

- Conduct research on forest-pasture integration;
- Develop genetic improvement programs;

- Promote traceability;
- Support the establishment of local agroindustries;
- Support programs aimed at developing biodiversity chains.
- Production Practices
- Ensure water quality in the corral and troughs;
- Provide adequate shading (natural or artificial) in pastures, animal leisure areas, and feeding areas;
- Ensure proper stocking rates;
- Implement irrigation systems for pastures;
- Conduct soil analysis, correction, and fertilization to improve pastures;
- Promote diversification and integration of agricultural and livestock activities;
- Adopt organic fertilization and the use of poultry, sheep, and goat manure;
- Monitor plant health and animal health, including vaccination and disease control;
- Adopt confinement and semi-confinement;
- Rational use of pesticides;
- Intensify the use of agricultural machinery.

These practices provided valuable insights to adjust the Livestock Sustainability Curriculum to the specific demands and conditions of the consulted territories, expanding its potential as a tool for sustainable development.

### *1.2. Suggestions for Improving the Solis App*

The workshop participants also provided specific contributions for improving the Solis app, suggesting functionalities that could increase its usability and impact among family farmers and technical agents.

The suggestions focused on including tools that favour personalization, user interaction, the organization of thematic content, and integration with other digital systems. These proposals reflect the search for a more dynamic, accessible app aligned with the target audience's needs.

Below are the main suggestions categorized by functionality:

### Search and Content Organization Features

- Search bar;
- Filter by theme (menu with thematic segments);
- Search through hashtags (#);
- Directed searches on specific topics.

### Posting and interaction Features

- Identification with photos of the post author;
- Date of posts;
- Comment notifications;
- Access user profile with all posted videos (filter by user).

### Communication and connection

- Chat/direct messages;
- Discussion forum;
- Adopt as a professional communication tool

### Usability and accessibility

- Offline mode;
- iOS access;
- Swipe-up function (navigation management).

### Engagement and Integration

- Monetization;
- Professional disclosure;
- Integration of academic practices (theory and practice);
- Environmental education.

### Advanced features

- Financial management feature for the property;
- Feature for verification, inspections, or audits.

### Improvement of user experience

- Satisfaction survey

# 2. CONTRIBUTIONS FROM LOCAL STAKEHOLDERS IN MARABÁ – PARÁ

In Marabá, the workshop included participation from the academic sector, represented by the Federal Institute of Pará (IFPA), the public company for technical assistance and rural extension EMATER, which provides services to producers in 21 municipalities in the region, including Novo Repartimento, the Marabá Agriculture Secretariat, and the Institute for Forest Development and Biodiversity of Pará State (Ideflor-bio), a state agency responsible for promoting sustainable development in the Amazon, through forest resource and biodiversity management, focusing on environmental conservation and sustainable use of these resources.

## *2.1. Practices suggested by Key Actors from Marabá*

Demands for Sustainable Development of the Livestock supply Chain

- Development of agricultural research projects more applicable to the needs of farmers;
- Sector strategies for family succession, encouraging youth engagement;
- Actions to strengthen cooperatives and associations;
- Genetic improvement for breeds adapted to the local climate;
- Overcoming challenges with suppliers of inputs (fertilizers, seeds, etc.) and energy;
- Strengthening the network for collecting and processing certified seeds;
- Programs like "Bom Destino," which donates stakes of wood seized by the federal police for fences and other rural constructions;
- Resources for expanding technical assistance (ATER) to support 25,000 producers in the region.

Production Practices

- Irrigation;

- Use of electric fencing;
- Adoption of solar energy systems in the field;
- Environmental regularization for water resource use;
- Use of reforestation wood for fences;
- Differentiated management for dairy and beef cattle;
- Reuse of waste for construction;
- Adoption of forage (e.g., EMBRAPA's capim-açu) for pasture management;
- Silage production (feasible structure models for producers);
- Integrated crop-livestock-forest systems (ILPF);
- Sanitary management: disease monitoring, vaccination, and animal health;
- Financial management and market cycles;
- Protection of springs.

### *2.2.Suggestions for improving the Solis app*

The group of participants in Marabá also highlighted some functional improvements for the Solis app, such as creating an exclusive area for content produced by technical organizations to differentiate it from content produced and posted by farmers, and a filter allowing content to be searched by region. However, the group discussed in-depth the challenges and potentialities that the proposal of combining a digital tool with the agroecological transition agenda may face in the region.

For the group, the use of tools like Solis faces significant challenges, mainly due to the lack of connectivity and gaps in ATER (technical assistance and rural extension), which limit the reach and effectiveness of these technologies in more remote areas. It is important to note that in the areas where the project was implemented, almost all producers have access to satellite internet, but the service may remain economically inaccessible for many farmers in more remote or less developed areas. On the

other hand, the group also highlighted how Solis has great potential for innovation and strengthening rural communities. In this regard, the participants emphasized the importance of promoting the tool at fairs and events like the Marabá Agrocultural Fair, which can increase its visibility and strengthen producers' engagement.

Regarding content generation and dissemination, the group reported that critical issues like reducing family labor and climate change arise as major obstacles, requiring solutions adapted to the local reality. The recovery of degraded areas, with its high cost compared to deforestation, also presents a challenge, but the search for innovative and sustainable solutions could drive the adoption of appropriate technologies. Continuous training is another crucial point, highlighting the need to invest in developing local skills to ensure the effectiveness of agroecological practices, and in this sense, Solis can play a key role by enabling local actors and institutions to generate and disseminate content on these important topics for the local population.

The contributions from participants reinforce the need to expand the scope of the suggested practices and features, emphasizing innovation, sustainability, and local-regional integration. Implementing these suggestions could make Solis and agricultural support programs more robust, effective, and aligned with the needs of family farmers.

# 3. CONTRIBUTIONS FROM LOCAL STAKEHOLDERS IN ALTA FLORESTA – MATO GROSSO

In Alta Floresta, the workshop included participation from representatives of the Ouro Verde Institute (IOV) and the Center for Life Institute (ICV), two third-sector organizations with a strong history of promoting sustainable development with small-scale farmers in the region. Private sector representatives from an ATER service company (Campo S/A) and a specialist in technical assistance projects also contributed regularly to public, private, and third-sector organizations in the region. Representing the public sector, the agricultural secretary of Alta Floresta was present.

According to the event participants, although there is beef cattle farming, family farming is predominantly focused on milk production, even though there is a trend of reducing milk production in favor of beef cattle. The viability of local agricultural activities is strengthened when family farmers are integrated into cooperatives and associations, which provide not only marketing channels but also additional benefits such as access to credit, technical assistance, and better negotiation conditions. This cooperative model contributes to the sustainability of production activities and helps farmers face market and production challenges.

In terms of challenges, the pressure from large-scale agriculture, especially soy, on family farming territories and livestock farmers makes it difficult to preserve resources and adopt more sustainable production models. Climate change, in turn, affects the availability of essential water resources, such as water for irrigation and animal consumption, further exacerbating the situation. Additionally, the difficulty of accessing credit makes investments in technologies and infrastructure improvements practically unfeasible for many producers. Lack of support for commercialization and logistics is also an obstacle, preventing farmers from efficiently selling their products. Scarcity of inputs, such as animal supplements during dry periods, and the need for new knowledge to implement practices like organic and agroecological production make the transition to sustainable models even more challenging. The lack of ATER and limited access to specific technical knowledge are additional barriers that hinder the adoption of new practices, requiring more support and training for farmers to overcome these challenges.

Additionally, resistance to technology is seen as a notable issue, as many farmers, especially the older ones, struggle to understand how new tools and practices can benefit production. The lack of labor in the communities is also a limiting factor, making it difficult to implement and maintain activities in the field. The market, with its uncertain and unpredictable prices, as seen with milk, creates an economic insecurity for farming families, who are unable to predict the profitability of their activities. Although technology is available, it often does not reach small producers due to access and adaptation difficulties. Moreover, solutions for the field need to be localized, as each region faces specific challenges, and the supply of alternatives must consider these different realities. The pressure from land concentration, with the migration of older producers and the reduction of dairy farming in favor of cattle, which requires less labor, also contributes to the shift in production dynamics.

### *3.1. Practices suggested by local stakeholders in Alta Floresta*

In the Alta Floresta region, there are several alternatives that have been satisfactorily consolidated on a small scale, but are promising and could contribute to the sustainability and diversification of family farming. Thus, the adaptation of the Curriculum for the territory should incorporate these successful experiences so that they can be disseminated among a larger number of producers.

For workshop participants, the most promising productive technology for family farming is the silvopastoral system, which aims to integrate pasture production with tree planting, promoting the recovery of degraded areas and improving environmental conditions. Initially, Agroforestry Systems (SAFs) were implemented in the more distant and degraded areas of the properties, with species focused on the cutting of valuable wood, without integration with other productive activities. However, the new concept of agro-silvopastoralism, which seeks to integrate livestock farming, tree planting, and other productive activities, creating more sustainable and efficient systems, has shown excellent results where it is implemented. The fact that many producers are also seed collectors reflects the potential for exploring local resources, in addition to strengthening biodiversity and sustainable production in the region.

Regarding milk production, although it is a challenging activity, it provides a continuous cash flow for producers, which can be a major economic incentive, despite the management difficulties. For this reason, financial management stands out, especially in the case of women, who play a leadership role in this process, contributing to strategic planning and the economic feasibility of adopting new practices.

The protection of water sources and proper water management have become priority issues for producers in the region. The management of organic and inorganic waste, along with effluent treatment, has also been a growing concern, reflecting the search for solutions to minimize environmental impacts. Techniques such as pest control and the use of sprays have also been successfully implemented in the region and need to be scaled up to increase the sustainability of the area.

### *3.2. Suggestions for improving the Solis app*

The use of digital tools has become increasingly common in the region, and WhatsApp is one of the main platforms used by producers, proving effective for sharing audios, short videos, and quick messages. Although it offers convenience and speed, one of the main challenges of this approach is the difficulty in filtering quality information. Many producers receive content from various sources, which can lead to confusion or misinformation. Examples like the ICV YouTube channel, which offers technical videos, highlight the growing digital presence, but direct interaction with technicians remains essential. Human contact, with the commitment to follow-up and the execution of plans, is seen as a key differentiator. This underscores the importance of balancing the use of digital tools with maintaining technical-personal relationships, ensuring that producers not only receive information but also have continuous and adequate support to apply practices in the field.

When evaluating Solis, the group emphasized the importance of information exchange between farmers, extension agents, and other stakeholders involved in promoting sustainability in Alta Floresta's agricultural production. According to the participants, this exchange through videos allows farmers to connect with relevant content and fosters more direct and effective communication between them, adding value to the collective learning process.

The suggested improvements for the app are as follows:

### Improvement of user experience

- Topic filter to allow users to access content more relevant to their specific needs.
- Live sessions within the app to engage producers in real-time, promoting interactive learning on topics relevant to their activities.
- Implement an algorithm that automatically directs users to topics of specific interest could optimize navigation and increase content personalization.
- Implement a central hub for questions that facilitates interaction with users' comments and inquiries
- Create regional forums where project partners and members could exchange information and experiences to strengthen the local support network and increase collaboration among stakeholders.
- Direct messaging (DM) between users to enhance communication and foster connections within the community.
- Layout and features: option to view videos in full-screen mode
- Simplified registration: Streamlining the registration process, allowing users to easily copy the verification code number
- Diversity: The current logo, which focuses on a white man and a homogenous farm, needs to be revised to better reflect the diversity of rural communities and producers
- Content: include content about aspects of local culture (for example cassava recipes) to create connections between production and consumption

# Agroecological TRANSITIONS Programme

The Program on Agroecological Transitions for Building Resilient, Inclusive, Agricultural and Food Systems (TRANSITIONS) aims to enable climate-informed agroecological transitions by farmers in low- and middle-income countries through the development and adoption of holistic metrics for food and agricultural systems performance, inclusive digital tools, and transparent private sector engagement. The *Inclusive Digital Tools to Enable Climate-informed Agroecological Transitions* (ATDT) aims to scale agroecological practices by enabling smallholder farmers to participate in co-design of digital tools and farming practices. Learn more about ATDT & find more outputs here.

It is led by:

TRANSITIONS is financed by:

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