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Increasing Bovine Productivity in the
South American Chaco Region
(ATN/RF-18079-RG)



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Abbreviations

INTA	Instituto Nacional de Tecnología Agroecuaría
ArgenINTA	Fundación ArgenINTA
INIAF	Instituto Nacional de Innovación Agropecuaria y Forestal
IPTA	Instituto Paraguayo de Tecnología Agropecuaria
FeGaSaCruz	Federación de Ganaderos de Santa Cruz
SENASA	Servicio Nacional de Sanidad y Calidad Agroalimentaria
CNA	Censo Nacional Agropecuario

Executive Summary

Despite the severe restrictions imposed by the COVID-19 pandemic, some activities have been carried out. Many activities of component 1 and 2 have been completed, while some activities of the component 3 and 4 were initiated in 2021. The main activities implemented in 2021 were:

- ✓ Virtual meetings with extension agents and private consultants were performed aimed at selecting livestock producers. Towards the end of the year, with COVID-19 related restrictive measures relaxed, meetings with farmer groups and visits to the pilot sites were done.
- ✓ Technological alternatives to be implemented and funded in each pilot site were selected and established in 41 farms in Argentina.
- ✓ In Bolivia and Paraguay, the pilot sites, along with the technologies to be implemented, are currently being defined.
- ✓ The baseline (weaning rate without project) was surveyed in 2021.
- ✓ The design of the registration system to monitor productive and economic indicators of the livestock systems, is now in progress.
- ✓ A survey was done to collect training demands from extension agents, consultants and farmers. This survey will be used in 2022 to establish the main contents of the face-to-face training program to extension agents, consultants and farmers and to develop the virtual training program.

I. INTRODUCTION

In recent decades there has been a rapid expansion and intensification of agricultural production in the South American Chaco region (Argentina, Paraguay and Bolivia), one of the largest remaining reserves of forest and uncultivated fertile land, globally. However, most livestock producers still maintain very low levels of productivity. A valid indicator to measure this low productivity is the low annual weaning rate (calves per cow per year), which is below 50%. The main problems that explain this low productivity are associated with the lack of farm infrastructure (e.g. pasture and paddocks), poor availability and planning of forage resources (e.g. forages crops, pastures, rangelands and reserves), inefficient herd management (e.g. lack of planning and organization of services, weaning) and lack of adequate health management (e.g. reproductive and parasitic diseases). In this context, the technical cooperation tries to improve the efficiency, stability and resilience of family livestock systems in the Chaco region, through the incorporation of alternative technologies for livestock management. Researchers, extensionists and producers from the three countries that share the South American Chaco, Argentina (INTA-ArgenINTA), Bolivia (INIAF and FeGaSaCruz) and Paraguay (IPTA-IICA), are participating in this cooperation. The project is not only focused on increased livestock productivity, but also on enhanced extensionist and producer capacities for the sustainable development of the region.

II. PROJECT EXECUTION AND RESULTS

2.1 Project objectives

- A** The project's objective is to improve efficiency, stability and resilience of the family livestock systems in the Chaco region, through the incorporation of technologies and capacities for enhanced livestock management. This is to be accomplished through the following main actions: (a) characterize the livestock production systems present in the project areas and to describe the main technological alternatives to improve the efficiency, stability and resilience of the farming systems; (b) establish pilot sites in farming systems for adoption, adaption, evaluation and demonstration of technological alternatives for sustainable livestock production; (c) implement a training and support program for innovation in sustainable livestock production, and (d) develop a system of registering and monitoring farms and to evaluate the adoption level of technological alternatives and their effects on the efficiency, stability and resilience of the livestock systems.

2.2 Advances in project activities

B In 2021, activities envisioned under component 1 and 2 were completed, and some activities under components 2 and 3 initiated. Meetings with extension agents and consultants were performed aimed at selecting the livestock producers to be participating in the project. Subsequently, meetings with farmer groups were conducted to characterize their production systems and to identify technological alternatives for improving livestock production. Following these events, the pilot sites were selected and visited by the project coordination team and extension agents to define the technological alternatives to be implemented and elaborate a work plan for each pilot site. Furthermore, a survey was done to obtain information regarding training demands from extension agents, consultants and farmers. This survey will be used in 2022 to establish the main contents of the face-to-face as well as virtual training program.

During 2021, the project was severely impacted by the COVID-19 pandemic that made meetings, visits, and other face-to-face activities challenging. Nevertheless and when possible, virtual meetings with extension agents and private consultants, were performed. Due to limited access to internet or travel restrictions, events with livestock producers could initially not take place. Towards the end of 2021, with COVID-19 related restrictions easing, onsite activities in Argentina, Bolivia and Paraguay were initiated (see Table 1 for an overview).

Table 1. Project Components and Activities

Component	Activities	Results	Current Status
1. Farming systems and technological alternatives	1. Characterization of the livestock production systems present in the project areas and description of the main technological alternatives to improve the efficiency, stability and resilience of the farming systems	One report (monograph) per country (3).	In execution in Argentina, Bolivia and Paraguay
2. Pilot sites in farmers' fields	2. Establishment of pilot sites in farming systems for adoption, adaption, evaluation and demonstration of technological alternatives for sustainable livestock production.	Pilot sites established (90)	Completed in Argentina (45). In execution in Paraguay (15) and Bolivia (30)
3. Training and support program for innovation in livestock production	3.1. Development of a face-to-face training program to extension agents, consultants and farmers. 3.2. Development of a virtual training course for livestock innovation.		Executing in Argentina, Bolivia and Paraguay Ejecuting in Argentina, Bolivia and Paraguay.
4. Farm registration system and level of technological adoption and effects on the livestock system.	4.1. Development of a system for recording and monitoring field data. 4.2. Conduct project start-up, follow-up and closing workshops. 4.3. Evaluation of the level of adoption of technologies and their effects on the farming system.	Recording system developed and in use by farmers. Extension agents and private consultants identified, and producer groups selected; all of them participating in the project. Publication containing the adoption and impact evaluation design.	Executing in Argentina, Bolivia and Paraguay Executing in Argentina, Bolivia and Paraguay Executing in Argentina, Bolivia and Paraguay.

2.3 Advances of activities by component

Component 1. Farming systems and technological alternatives

Activity 1. Characterization of the livestock production systems present in the project areas and description of the main technological alternatives to improve the efficiency, stability and resilience of the farming systems.

The meetings with extension agents, private consultants and livestock producers allowed for the gathering of information, characterization of the farming systems and identification of potential technological alternatives to improve livestock production. Moreover, secondary information was obtained from the last National Agricultural Census (CNA 2018) and the National Service of Health and Agrifood Quality (SENASA), such as on weaning rate per heard size and province (see Table 2). Reports (monographs) are in progress and will be presented in the coming months (Product 1).

Table 2. Properties, heads and weaning rate per herd size and province in the argentinean Chaco (SENASA, 2021)

Herd size province	0-500 Heads				>500 Heads			
	Properties	Properties (%)	Heads(%)	Weaning rate(%)	Properties	Properties (%)	Heads(%)	Weaning rate(%)
Sgo del Estero	8982	99	60	29	121	1	40	62
Salta	4226	98	51	31	75	2	49	66
Tucuman	1781	100	70	19	9	0	30	46
Formosa	8514	99	62	29	140	1	38	47
Chaco	12600	99	73	48	168	1	27	55
Mean	36103	99	63	31	513	1	37	55

Component 2. Pilot sites in farmers' fields

Activity 2. Establishment of pilot sites in farming systems for adoption, adaptation, evaluation and demonstration of technological alternatives for sustainable livestock production.

The pilot sites were selected in agreement with the farmer groups and visited by the coordinator team and extension agents to define

the technological alternatives to be implemented and funded in each site. In Argentina, 41 pilot sites were established in farms. In these sites, technologies have been adopted and are now under evaluation, mainly related to forage management (Table 3). A work plan has been elaborated for each pilot site. In Bolivia and Paraguay, the pilot sites, along with the technologies to be implemented, are currently being defined.

Table 3. Adopted technologies in the Argentinean pilot sites

#	Location	Farmers group	Adopted technology
1	Salta, Santa Victoria Este	Campo Largo N	Animal health management
2	Salta, Santa Victoria Este	Campo Largo S	Animal health management
3	Salta, Santa Victoria Este	Asoc Productores Real Frontera N	Animal health management
4	Salta, Santa Victoria Este	Asoc Productores Real Frontera S	Animal health management
5	Sgo. del Estero, Frías	Silvopastoril Frías	Forrage management
6	Sgo. del Estero, Frías	La Represa	Forrage management
7	Sgo. del Estero, Ojo de Agua	Ganaderos de Ojo de Agua	Animal health management
8	Sgo. del Estero, S. J. de Boqueron	Chañar Bajada	Livestock infrastructure
9	Sgo. del Estero, Santo Domingo	Ganaderos de Sto. Domingo	Livestock infrastructure

#	Location	Farmers group	Adopted technology
10	Sgo. del Estero, Mte Quemado	El Manfrullo	Forrage managment
11	Sgo. del Estero, Amama	Comunitario de El Hoyo	Livestock infrastructure
12	Sgo. del Estero, Tintina	Ganaderos en crecimiento	Early weaning
13	Sgo. del Estero, Sachayoj	Arbol Blanco Sur	Forrage managment
14	Sgo. del Estero, Juries	Union y amistad Este	Forrage managment
15	Sgo. del Estero, Juries	Union y amistad Norte	Forrage managment
16	Chaco, Colonia Benitez	Charadai	Forrage managment
17	Chaco, Colonia Benitez	Margarita Belen	Forrage managment
18	Chaco, Colonia Benitez	La Leonesa	Forrage managment
19	Chaco, Colonia Benitez	Puerto Eva Peron	Forrage managment
20	Chaco, Colonia Benitez	Makalle	Forrage managment
21	Chaco, Colonia Benitez	Basail Norte	Forrage managment
22	Chaco, Colonia Benitez	Basail Sur	Forrage managment
23	Chaco, Colonia Benitez	Las Palmas Norte	Forrage managment
24	Chaco, Colonia Benitez	Las Palmas Sur	Forrage managment
25	Chaco, Colonia Benitez	Las Palmas Este	Forrage managment

#	Location	Farmers group	Adopted technology
26	Chaco, El Colorado	Selva del Río de Oro	Forrage managment
27	Chaco, El Colorado	Colonia Pastoril	Forrage managment
28	Chaco, El Colorado	San Martín	Forrage managment
29	Chaco, El Colorado	Pampa del Indio Este	Forrage managment
30	Chaco, El Colorado	Pampa del Indio Oeste	Forrage managment
31	Chaco, Las Breñas	Pampa Mitre	Forrage managment
32	Chaco, Las Breñas	Pinedo	Forrage managment
33	Chaco, Sáenz Peña	Machagai Sur	Forrage managment
34	Chaco, Sáenz Peña	Machagai Norte	Forrage managment
35	Chaco, Sáenz Peña	La Plaza Vieytes	Forrage managment
36	Chaco, Sáenz Peña	La Plaza, 13 de junio	Forrage managment
37	Chaco, Sáenz Peña	Castelli	Forrage managment
38	Chaco, Sáenz Peña	San Bernardo	Forrage managment
39	Chaco, Sáenz Peña	Santa Sylvina	Forrage managment
40	Chaco, Sáenz Peña	Villa Angela Este	Forrage managment
41	Chaco, Sáenz Peña	Villa Angela Oeste	Forrage managment

Component 3. Training and support program for innovation in livestock production

Activity 3.1. Development of a face-to-face training program to extension agents, consultants and farmers.

During the field trips, a survey was done to collect training needs from extension agents, consultants and farmers. This survey will be used in 2022 to establish the main contents of the face-to-face and virtual training programs.

Activity 3.2. Development of a virtual training course for livestock innovation

A virtual meeting was done with the e-learning area of INTA to plan the next steps for developing the virtual course in late 2022.

Component 4. Farm registration system and level of technological adoption and effects on the livestock system.

Activity 4.1. Development of a system for recording and monitoring field data.

A registration system to monitor the main productive and economic indicators of livestock systems is currently being designed. Specific farm registration forms were prepared and are being used to determine the baseline (weaning rate without project).

Activity 4.2. Conduct project start-up, follow-up and closing workshops.

Virtual and some face-to face meetings with extension agents and private consultants were performed aimed at selecting livestock producers (see Appendix 1). Towards the end of the year, with COVID-19 related restrictive measures relaxed, meetings with farmer groups and visits to the pilot sites were done (see Appendix 2).

Activity 4.3. Evaluation of the level of adoption of technologies and their effects on the farming system.

Although this activity will be carried out in the last year of the project, some initial reflection were made regarding the technology's adoption process in a context of uncertainty to better understand the determinants of adoption and its potential benefits from the perspective of producers. Some of the questions for the evaluation will be: What has been the impact of the project on productive efficiency? What has been the impact of the project on the price perceived by the producer? What is the project's ex-post aggregate economic performance in terms of profitability and economic return?

4 CONCLUSIONS

Despite the severe restrictions imposed by the COVID-19 pandemic, project activities advanced fairly well. As long as the restrictions do not further limit the field work, the programmed activities with extension agents, private consultants and producers can continue to be conducted in the three countries.

5 DIGITAL REFERENCES

<https://www.fontagro.org/new/proyectos/chaco-productividad-bovina/es>

APPENDIX 1

Plate 1. Meetings with extension agents, private consultants and farmers in Argentina, Bolivia and Paraguay



APPENDIX 2

Plate 2. Visits to the pilot sites in Argentina, Bolivia and Paraguay.

