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Cattle farming, Armed Conflict, and Climate Change: Possibilities and Limitations in a Case Study in the Colombian Amazon

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Introduction

Caquetá, one of the departments comprising the Colombian territory, is viewed as a transitional corridor between the Andean and Amazonian regions. Economically, Caquetá has integrated into the country through extractive activities such as quinine extraction, rubber, wood, coca, livestock farming, oil, and gold mining (Tobón, 2018); the unsustainability generated by these extractive activities has direct and indirect impacts on climate change. Parallel to this, the weak State presence and precarious economic conditions turned Caquetá into a hub for drug trafficking and the operations of illegal groups such as the FARC-EP guerrilla since the mid-1960s, and the United Self-Defense Forces of Colombia (AUC) paramilitary group, especially between 2001 and 2005 (CNMH, 2013). This has led the people of Caquetá as victims of massacres, kidnappings, extortions, and other crimes that resulted in poverty, displacement, and migration.

This study, is part of the research initiative of the CGIAR Livestock and Climate initiative, aiming to understand the relationship between "traditional" livestock practices, their effects on greenhouse gas emissions, climate change, and the willingness of livestock producers across various territories to adopt sustainable practices and technologies. In the case of Colombia, this project introduces the variable of armed conflict and livestock land use in Caquetá, magnifying extensive land use and hindering the transition to sustainable livestock farming. The primary interest of the study is to understand the implications arising from conflict dynamics, climate change and livestock farming in the Caquetá department. Many producers, amid the project, have decided to undergo livestock conversion processes such as water harvesting, livestock aqueducts, pasture division, tree strip establishment, pasture renewal, food security, and mixed forage banks. However, different challenges arise in this scenario. In this research endeavor, we focus on addressing the following questions through qualitative work: What are the dynamics of conflict in the study area, and how have they impacted livestock farming, livestock farmers, and livestock farming? How is the relationship between livestock farming and climate change understood?

Material and Methods

The study's objective proposed a qualitative methodology, and involved designing and conducting workshops, focus groups, and interviews in the municipality of Puerto Rico, Caquetá (Colombia), which is part of the Program for Territorial Development with a Territorial Focus (PDET), established in 2017 within the framework of the peace agreements between the Colombian government and the FARC-EP. The first stage of this project was carried out with 32

livestock families in the municipality of Puerto Rico. For the collection of qualitative data, five "reflection circles on conflict" were conducted and 10 complementary interviews.

Results and Discussion

The results and discussion will be presented in two separate topics: Perceptions of the impact of armed conflict on Livestock Farming and Perceptions of the impact of climate change on Livestock Farming and the practices associated with reducing this impact among the developed project of Livestock and Climate and Rutas PDET.

Perceptions of the impact of armed conflict on Livestock Farming

Armed Conflict Cattle rustling or livestock theft, extortions (called "vaccines"), kidnapping and population displacement were the primary crimes. Ranchers, their farms, animals, and productive activities were configured as a "war booty" from which armed actors could obtain funding. Crimes against ranchers increased between 1997 and 2006, with 2002 being the year with the highest reported crimes, related to the entry of paramilitaries into the areas in the 90s (CNMH, 2013, Comisión de la Verdad, 2022). Currently, after the signing of the Peace Agreements with the FARC-EP guerrillas in 2016, the armed conflict is perceived as a permanent shadow in the lives of Puerto Rico's farmers, a constant uncertainty in the lives of families. In focus groups, producers mention that extortions were previously based on the number of cattle, but currently, they include a percentage for each liter of milk and there are rumors it will extend to the number of owned hectares. Interviewees claim that non-payment of these vaccines implies death, forcing them to comply with the directives of the armed groups or forced displacement. Also, the existence of various dissident groups, criminal bands, and narcoparamilitary groups makes the current situation confusing, as there is no way to identify who they are or where they come from.

Production Costs One of the main problems directly faced by livestock families was related to roadblocks (which difficult the transport of milk, cheese, or livestock) and the destruction of public infrastructure (bridges, roads). Restrictions on the mobility of people and inputs cause the prices of these inputs to rise, increasing the direct costs of livestock production.

Food Security The blocking of access routes to supply centers, prevention of going to populated areas to acquire groceries, the regulation, control, and surveillance of the quantity of food that could be purchased resulted in "shortages", "scarcity," "price increases," and "hunger." If a family finally managed to reach the town through alternative routes to stock up, they faced other challenges: the cash that livestock farmers have is earned from selling milk or cheese, so with no transportation, they cannot sell and lack cash to buy food; second, even if the producer has money, there might be nothing to buy because no food enters the town; third, the few minimarkets with supplies unjustly raise prices, having a monopoly on the supply.

Dairy Production Milking, being a daily activity, is most affected by mobility restrictions. The conditions in which producers find themselves, especially small producers living in remote areas with limited access, mean that they must bear the additional costs arising from unforeseen circumstances. The sale of fresh milk is reserved for farms near access roads or urban centers with investments in refrigeration tanks. On the other hand, small and medium-sized livestock farmers in remote areas must focus on selling salted cheese. The price is lower if the distance for collection is long. Intermediaries in the milk marketing process have become significant actors in the conflict. Nestlé entered Caquetá in 1975, causing a shift in the land's productive vocation. By 2007, the company was forced to leave certain municipalities in the department due to FARC-EP pressure, as it refused to pay extortion or comply with the guerrilla's proposed milk purchase rates. This withdrawal led to changes in milk marketing chains, resulting in the establishment of numerous cheese producers and dairy distributors to sustain the regional economy, reaching up to 80% of product commercialization at one point. Interviewees mentioned that the price of milk per liter continues to decrease, paralleling the trend in cheese prices.

According to economists, events that directly affect the marketing and sale capacity of products are perceived as additional costs to agricultural production, impacting costs and discouraging subsequent investment, innovation, and improvements in production process efficiency (Pinilla de Brigard, 2013). However, this perspective ignores the existence of a plurality of actors within livestock farming in Colombia, where different interests converge, involving small, medium, and large producers (Van Ausdal, 2009). Previous observations have determined that this economic logic of yields prevails, especially among actors with profitable livestock or a "cutting" livestock system: they decrease their investment in livestock farming when episodes of violence intensify since the risk of losing what is invested is high. Larger producers, with extensive livestock production systems, may see this as a profitable activity that involves lower risks, as the business can be managed remotely, with sporadic visits, and intermediaries can intervene in case of vaccines, extortions, and dialogues with armed actors (CNMH, 2013; Ponce de León-Calero, 2019). On the other hand, producers whose dedication is focused on dual-purpose livestock and with few heads of cattle may not necessarily be influenced in their work and investment intentions on the farm by obstacles caused by the destruction of infrastructure. Studies in rural economics (Pinilla de Brigard, 2013) have asserted that in contexts of armed conflict, the perceived risk of land dispossession reduces the trust and sense of security among producers; to minimize losses, they may exploit the land below its potential. This can be a strategy of "not showing off" and maintaining a low profile to avoid extortion and theft. However, it also reflects a lack of willingness on the part of producers to adopt technified production processes or greater efficiency. In a context where people's life plans have been radically disrupted by events related to the conflict, decisions regarding productive activities go beyond the economic aspect, involving family tradition, life plans, and their relationship with their surroundings. It is interesting to see this strategy of maintaining a low profile as a way not only to avoid economic extortion but also to reduce the chances of losing land and what that entails. Based on the fieldwork conducted, it would be unfair to overlook the fact that, despite the events experienced and the way these phenomena are analyzed from an economic perspective, the traces of conflict have not erased the will and interest in livestock activities and the attachment to the tradition of these livestock farmers. While the interviewees are aware of the market dynamics affecting small producers, some of them maintain hope that by implementing livestock-inclusive projects, such as the present project, they can improve their conditions and find a better price for milk. This discussion is not aimed at denying the economic rationality of the producer but rather introducing other biases to avoid reductionism and consider aspects beyond the economic realm.

Perceptions of the impact of climate change on Livestock Farming and the practices associated with reducing this impact among the developed project of Livestock and Climate and Rutas PDET

During the workshops, producers mentioned that there used to be a greater distinction between summer and winter, and that the seasons nowadays have become "uncontrollable." There is a perceived increase in extreme events, both in the dry season and the rainy season, even if they do not have formal information about climate trends in their territory. In the summer, there is a decrease in water availability for the animals, as well as a reduction in grass growth. This implies that animals experience heat stress and may have episodes of diarrhea from drinking stagnant or hot water, or they may develop lameness due to hoof infections. In the winter, in terms of pasture damage, this season causes weeds to grow rapidly, and due to the soil, there are waterlogged conditions, coupled with the pastures being susceptible to a type of frothy bloat. In terms of animal impact, winter increases the chances of mastitis, foot-and-mouth disease, and lameness in cows and calves. There is also a higher presence of flies on the cows.

Regarding perceptions of reducing the impact of livestock on climate change through the project "Livestock and Climate and Rutas PDET", producers mention a generalized change, especially due to trees for shade and cattle comfort, soil oxygenation, and soil decompaction.

Optimization of cattle feed and a reduction in the distances cattle must travel to drink water are also mentioned, impacting the prevention of damage to water sources by cattle. In terms of pastures, the establishment of pasture strips reduces soil compaction, promotes faster grass growth, and, consequently, cows produce more milk. It is mentioned that the implementation of these technologies should align with the needs of each territory and farm, as not everyone requires the same. Producers say that in the case of water harvesters, it would be important to also provide an electric pump or motor pump for farms without electricity, as well as hoses and a grass chopper for cut grass. Regarding food security practices, it is said that, although the idea is good, cassava and plantains do not thrive in that area, or the delivered seeds were of poor quality. The same is said about the planted trees, which have died or are small in many cases, and they would have preferred them to be timber trees.

Conclusions and Outlook

The way traditional livestock systems in Caquetá are established makes small livestock systems more vulnerable to climate change and extreme weather events, with few adaptability strategies to external threats. This adaptability depends on the availability of different types of capital, whether natural, physical, social, or human. Despite the awareness of the need to adopt more sustainable production systems, there are still other variables working against small producers. They are at the mercy of traders who dictate quality and production conditions and monopolize the price paid for milk. They are burdened by the rising costs of inputs, jeopardizing remittances, and family sustainability. Also, there is the structural and unequal land tenure problem in Colombia. In other words, the interviewed small producers find themselves immersed in what authors have referred to as an "agricultural squeeze," where they are forced to sustain the mechanization of agricultural production for intensification; lacking the reproductive capital to do so, they are pushed into bankruptcy and displaced from their livelihoods (Bernstein, 2010). This situation is compounded by their presence in contexts of armed conflict where motivations, past events, and prospects are affected by uncertainty and fear of displacement or involvement in other violent situations. In such contexts, it is important to consider climate change adaptation as a multi-faceted situation, highlighting the interconnections between livelihood strategies, capitals, and various stressors, and incorporating this understanding into the planning of strategies, technologies, and techniques tailored to their needs (Aguilar-Jiménez et al., 2019).

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