Public policies for the development of a sustainable, forage-based cattle sector in Colombia, Argentina, and Costa Rica: A comparative analysis

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Abstract
Projected increases in global food demand highlight the importance of Latin America as one of the major future food suppliers, particularly regarding animal-source foods such as beef or milk. Despite the importance of the cattle sector for the region, its negative environmental impacts are numerous and the shift towards sustainability is perceived as slow and uncoordinated. This study aims to identify achievements and difficulties in the implementation of public policies for a sustainable cattle sector in Colombia, Argentina, and Costa Rica, for which policies focused on the use of silvo-pastoral systems and forage-based solutions are prioritized. Based on the review of scientific articles, government reports, and publications of international organizations, a comparative qualitative analysis was carried out, documenting the policy developments between 2010-2020. For the three countries, the findings highlight a large number of public policies focused on the implementation of silvo-pastoral systems, both at the local and national levels. At the same time, the efforts of the governments to include such strategies in the National Development Plans and stimulate legislative advances are evident. However, they also coincide in difficulties, such as the disconnection and lack of continuity between policies, unclear budgets for their financing, and little socialization within the communities. Another obstacle to the success of public policies is the way in which they are perceived by producers, who on many occasions refuse to make the transition from conventional to sustainable methods, considering that it implies the availability of economic resources, knowledge, and training that are difficult to access. The results also indicate that, despite the initiatives developed over the last ten years, problems such as deforestation and increasing greenhouse gas emissions persist in the three countries, although to different extents and at different levels. It is concluded that the policy efforts for the implementation of silvo-pastoral systems should be seen as initial steps in a long-term process towards achieving a sustainable cattle sector. Recommendations are provided that could help increase the success of these and new policies at different stages, from the identification of the problem to their evaluation, particularly given the difficulties of financing, disconnection, and participation of citizens and producers.

Introduction

By contributing with more than 25% of the global beef and 10% of the global milk production, Latin America and the Caribbean play an important role in the global cattle industry (CEPAL et al., 2017). The cattle sector generates internal and external benefits as it guarantees the food security of the countries and strongly contributes to their economies. Cattle production in the region not only has a long tradition but also is foreseen a promising future. By 2050, global meat consumption will increase by 100%, favoring the Latin American cattle industry due to the geographic location and availability of both human and natural resources (BID, 2018). Despite this positive panorama, traditional cattle systems are still predominant in the region and cause multiple impacts at the environmental level, such as on water and soil resources, the loss of biodiversity, the emission of greenhouse gases, and deforestation, among others (Rao et al., 2015). The political debate centers around the transition from traditional to more sustainable cattle systems, in which natural resources are being conserved, and social and economic benefits increased (Varijakshapanicker et al., 2019).

This short paper gives an overview on the successes and difficulties in the development and implementation of public policies for a sustainable cattle sector in Colombia, Argentina, and Costa Rica from 2010 to 2020.

Methods and Study Site

For this study, Colombia, Argentina, and Costa Rica were selected as countries of analysis considering their contrasting socioeconomic realities and the strong efforts they have already made toward the transition to a sustainable cattle sector, evidencing the ongoing political debate and goodwill toward meeting the targets established in the Paris Agreement and the Sustainable Development Goals (SDGs) 2015–2030.

Literature review was used as the main data collection technique. The analysis focuses on policies implemented during 2010–2020 and relates fragmented knowledge, contrasts different sources, and updates existing literature, aiming at providing a state of the art of public policies directed toward the development of a sustainable cattle sector. Data collection was carried out from January to May 2021 focusing on three types of data sources: (i) scientific articles, (ii) government reports and other official and legal documents, and (iii) publications by international organizations. These sources were consulted to contrast the official figures and positions of the countries. In total, 115 sources were used for the analysis (Lerma et al., 2022).

Results

Colombia

During the past decade, the different Colombian governments have put environmental protection at the center of their policies. The National Development Plan 2010–2014 comprised environmental sustainability as a priority for both well-being and equity of future generations. For the 2014–2018 period, this premise continued, emphasizing more strongly the importance of protecting natural reserves and regulating land use. The plan for 2018–2022 added a long-term project perspective, proposing the achievement of the SDGs by 2030. Likewise, three regulations emerged during the period of analysis with an influence on sustainable development: (i) Decree 870 of 2017, on the establishment of payments for ecosystem services (PES); (ii) Law 1876 of 2017, on the creation of the National Innovation System for the Agriculture and Livestock Sector (SNIA); and (iii) Law 1931 of 2018, on guidelines for climate change management by public and private entities.

Another is the Colombian Roundtable for Sustainable Cattle (MGS-Col), which consists of one national-level and 15 regional-level roundtables and aims at being a benchmark in the design and implementation of sustainable cattle programs, capacity building in rural areas, interinstitutional exchange, and policy development. The MGS-Col is a member of the Global Roundtable for Sustainable Beef (GRSB). Another multi-sector initiative was the Sustainable Colombian Cattle Project (GCS), which ended in 2019 and aimed at strengthening Colombian cattle production through the integration of environmentally friendly practices. Among the objectives were the transformation of 35,500 hectares into silvo-pastoral systems, the preservation of 15 hectares of native forests, the development of PES schemes, the creation of forage nurseries, and technical assistance for 3,900 cattle farms on sustainable intensification. Other initiatives are the Integral Program for Productive and Environmental Reconversion of the Cattle Sector (PIRPAG), aimed at supporting the transition of the national cattle sector toward sustainability over a period of 30 years, and the Zero Deforestation Agreements described in the National Development Plan for 2018–2022. Finally, as one of the suggested Nationally Appropriate Mitigation Actions (NAMAs), which respond to the Nationally Determined Contributions (NDC) agreed at the COP21 in 2015 in Paris, the Sustainable Cattle NAMA is being developed.

Parallel to these developments, the implementation of public policies at the regional level is happening, including, for example, (i) the Departmental Agricultural Extension Plans (PDEA), and (ii) the credit scheme for silvo-pastoral systems launched in 2020, seeking to promote sustainable practices in the different cattle regions of the country. Nationally, the Agricultural and Rural Development Policy 2018–2022 aims at promoting agricultural competitiveness and productive transformation based on three pillars. The strategy involves technology (access and implementation), agricultural extension, and financial instruments, and proposes the establishment of pilot farms in each of the country's cattle regions.

Argentina

To counteract problems such as water deficit and droughts, the Participative Federal Agri-Food and Agroindustry Strategic Plan for 2010–2016 proposed that, by 2015, all national policies should integrate the principles of sustainable development and thus reverse the loss of natural resources. For its part, the Territorial Strategic Plan (PET), launched in 2011, recognized the cattle sector as a promoter of desertification, particularly through overgrazing. It proposed that all citizens needed to achieve environmental sustainability and included the promotion of sustainable productive development in the guidelines for territorial and land-use planning in rural areas. The National Policy and Strategy for Territorial Development and Planning, launched in 2016, defined the achievement of an environmentally sustainable society as main objective, proposing strategies such as improving knowledge about natural resources and including the environmental dimension as a transversal axis in public territorial policies and actions at the federal, provincial, and local levels. Three laws that directly and indirectly influence the cattle sector and its sustainable development stand out: (i) Law 26331 on budgets for the protection of native forests; (ii) Law 27066 on regulating cattle production in (semi-)arid zones; and (iii) Law 27520 on budgets for climate change adaptation and mitigation.

One of the principal multi-sector initiatives is the public-private Argentine Sustainable Beef Board (MACS), which aims at promoting sustainability policies for the cattle sector. Another multi-sector initiative is Carne del Pastizal, aimed at stimulating cattle production based on practices that preserve biodiversity, in addition to generating positive impacts in economic and social terms. One of its main achievements was the export of certified grass-fed beef to Europe. Regarding the NAMA concept, no policy exists yet for the cattle sector, although various actions aim at reducing GHG emissions according to the NDCs defined in Paris in 2015.

At the regional level, it is necessary to refer to three important policies. The first is called Pastures and Savannas of the Southern Cone of South America, which since 2010 promotes sustainable cattle ranching in grasslands by integrating environmental conservation practices into agricultural production. The Santafesino Cattle Plan, launched in 2018, aims at generating suitable conditions for the growth of cattle production and the adoption of good animal husbandry practices and sector sustainability. The Enterriano Cattle Plan, launched in 2020, aims at strengthening the development of the sector at the provincial level and is based on four programs: (i) technical advice, (ii) beef differentiation and certification, (iii) financial assistance, and (iv) implementation of good animal husbandry practices.

The National Management Plan for Forests with Integrated Cattle (MBGI) was launched in 2015, responding to Law 26331 of 2007 and promoting the design and monitoring of forests with integrated cattle as well as the implementation of silvo-pastoral systems. The National Program on Natural Resources, Environmental Management, and Eco-Regions (PNNAT), launched in 2015, aims at contributing to the protection of the environment in the agricultural sector through a progressive improvement of sustainability in rural areas and production systems. Finally, as one of the most important public policy instruments nationally, Rural Change II, Innovation, and Investment (CRII) stands out. This program emerged in 1993 but was relaunched in 2013 with the objective to support association of small- and medium-sized enterprises, agri-food, and agroindustry to strengthen the sector. CRII has an improvement plan with an environmental sustainability component, in which aspects such as the appropriate use of agrochemicals and good water management are proposed.

Costa Rica

The 2011–2014 National Development Plan set out environmental protection as main objective, suggesting the incorporation of fundamental elements of sustainable development into the national policies and the reversion of natural resource degradation, while promoting an economy with minimum levels of greenhouse gas emissions in search of carbon neutrality by 2021. This last goal was reiterated in the 2015–2018 National Development Plan as well as the need for climate change mitigation and adaptation actions in the agricultural sector. For 2019–2022, these precepts were continued with specific measures, such as interventions on cattle farms applying the NAMA model and silvo-pastoral systems/agroforestry models. Regulations on environmental sustainability are diverse, but two stand out: (i) Executive Decree 37017 on the use of slurry from cattle to improve the characteristics of the soil, and (ii) Executive Decree 39482 on the National Strategy for Low Carbon Cattle (ENGBC) 2015–2034 and the objective of carbon-neutrality.

The Cattle NAMA stands out as an example for multi-sector efforts. Developed in 2013, it aims at transitioning the cattle sector toward productive efficiency, climate change adaptation, and GHG emission reductions. The mitigation potential of the NAMA is related to such as increasing forest cover, rational grazing, living fences, and pastures improvements and fertilization. In 2015, the design of Regional Livestock Development Plans started, responding to local problems in agreement with the national objective of carbon-neutrality.

At the macro-level, Costa Rica started the National Strategy for Low Carbon Cattle 2015–2034, proposing the promotion of cattle in areas with less exposure to climate vulnerability, the establishment of more silvo-pastoral systems, and a set of low-carbon technologies, including living fences, improved pastures, and rational grazing. The Costa Rican Policy for the Agri-Food Sector and Rural Development 2010–2021 incorporates climate change and agri-environmental management as one of its four pillars, referring to the need to promote sustainable production systems through an ecosystem approach, for which PES schemes were adopted as an instrument. This continues with the National Decarbonization Plan 2018–2050, whose ninth axis mentions the importance of eco-competitive cattle production based on productive efficiency and reduced GHG emissions.

Discussion [Conclusions/Implications]

Colombia, Argentina, and Costa Rica show a willingness of state institutions to promote a sustainable cattle sector, expressed by their National Development Plans and legislative advances. The strategies of the three countries are similar, focusing on the need to reverse the loss of natural resources, reduce GHG emissions, stop deforestation, and promote the use of silvo-pastoral systems. Although these documents usually contain

general statements regarding the problems, often without being reflected in tangible results, it is necessary to recognize that they have also been the starting point for large-scale initiatives. The carbon-neutrality objective of Costa Rica stands out, a commitment that has made the country an international benchmark.

The national, regional, and multi-sector strategies that exist in the three countries are another expression of this political will. The capacity for articulation among the actors is fundamental, linking state, private, academic, and other institutions, since it responds to the concept of public policy in which decisions are the result of joint work. It should be noted that the Sustainable Cattle Roundtables of Colombia and Argentina have had a preponderant role in the processes since they include both national and international actors. Regarding the continuity and association of the programs, disparate circumstances are evident. In the case of Costa Rica, the carbon-neutrality objective has been preserved in the different governments and National Development Plans as well as in multi-sector and regional initiatives, such as the Cattle NAMA. In Argentina, although without a purpose as defined as that in Costa Rica, the national policies have managed to articulate with those in the provinces in the adoption of silvo-pastoral systems. The situation in Colombia has not been as favorable because, for many years, no public policy coordinated local sustainability efforts, and thus their development has been independent and in a disorderly manner.

The results suggest the sustainable development of cattle as an unquestionable necessity. International demand, in addition to the role of different actors, limit the possibility of continuing with traditional production practices. This scenario prompts the national governments to take forceful actions, which is not always reflected in the same way, since each country has particularities that determine the processes and, therefore, the results. Colombia, Argentina, and Costa Rica demonstrate such contrasts. Therefore, understanding their public policies implies going beyond the numbers to consider their particular social and economic conditions. Although the three scenarios show dissimilar advances, the realities are not completely opposite to each other. On the contrary, the general perception is similar insofar as they are all in a process of evolution and still have many objectives to be achieved within the framework of the Paris Agreement and the SDGs 2015–2030. Even though the results are not fully satisfactory, the actors should persist so that public policies can lead to tangible effects. It is therefore necessary to strengthen both the articulation between the initiatives and the actors, while overcoming the fears of associations and producers to adhere to the transition process toward sustainability.

For the three countries of analysis, it is recommended to develop public policies with clear timelines and budgets that facilitate their application, development, and evaluation. At the same time, it is necessary to strengthen extension systems to provide cattle producers with the necessary knowledge for the transition to sustainable cattle systems. For Argentina, it is recommended that state institutions increase their efforts in deforestation policies, mainly for the Gran Chaco region. Colombia must formulate more ambitious objectives regarding the implementation of silvo-pastoral systems. In Costa Rica, it is essential to articulate actions of national and international institutions with a multi-sector platform for sustainable cattle. For the three countries, the consolidation of the use of technological innovations that contribute to the monitoring of deforestation is recommended. Likewise, communication channels should be established among the countries evaluated in this study that support the exchange of knowledge, mutual learning, and sharing of successes and difficulties in the implementation of public policies related to the sustainable intensification of the cattle sector.

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