Policy Sciences (2023) 56:69–93
https://doi.org/10.1007/s11077-022-09485-z

RESEARCH ARTICLE

Environmental policy integration in a newly established natural resource-based sector: the role of advocacy coalitions and contrasting conceptions of sustainability

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Accepted: 10 November 2022 / Published online: 28 November 2022

Abstract
Contributing a new South American case study, this paper seeks to advance the research agenda on processes of policy integration by developing a better understanding of how nascent subsystems become integrated into mature ones and the role that changing beliefs of advocacy coalitions play in fostering policy integration. The paper examines environmental policy integration in Uruguay's forestry sector since the 1990s and is based on an inductive qualitative analysis of policy documents, sector reports, parliament hearings and semi-structured interviews with key stakeholders. This demonstrates that environmental policy integration has increased continuously since the 1990s, accelerating particularly during the 2000s. We can derive three insights that specifically address this path of integration: a change in the policy beliefs of the dominant advocacy coalition, international salience of the minority coalition`s beliefs and participatory policy processes that foster interactions between opposing coalitions. Despite this, the two advocacy coalitions have crystallized with fundamentally different deep core beliefs about what a sustainable forestry sector should be. While one coalition argues that commercial tree plantations are sufficiently regulated in environmental terms, the other coalition maintains that the way that the pulp industry has developed in Uruguay is fundamentally unsustainable and therefore seeks to change the forestry sector as a whole.

Keywords Policy integration · Advocacy coalitions · Forestry · Sustainability · Bioeconomy · Uruguay · South America

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Introduction

There is a general consensus that policy integration must be conceptualized as an ongoing process (Candel & Biesbroek, 2016; Cejudo & Trein, n.d.; Jordan & Lenschow, 2010). It is also a challenging process. Even though policy integration is often regarded as a desirable way to increase effectiveness, particularly in addressing complex problems, such as climate change, in practice it faces significant obstacles because it requires overcoming the sectoral logic that generally characterizes policy-making (Briassoulis, 2004; Peters, 2018; Rukundo et al., 2011; Tosun & Lang, 2017; Trein et al., 2021). This also means that policy integration is not just a technical question of how to make policy-making more effective, but it is a highly political process among actors with different interests, values and preferences (Cejudo & Trein, n.d.; Winkel & Sotirov, 2016). In these interactions some actors have more influence, resources and weight than others. Similarly, some subsystems are more mature than others (Sabatier & Weible, 2007).

Policy integration then reflects a process of change and politicization. Such a process is particularly significant if a nascent subsystem tries to become integrated into a mature one. A key empirical question is therefore: how does policy integration of nascent subsystems happen, how are the obstacles to policy integration overcome or what are the drivers and dynamics that have made this possible? In this paper we seek to address this question through an in-depth inductive qualitative study of policy integration of the nascent environmental subsystem into the mature economic one over 30 years between 1990 and 2020 in the forestry sector of Uruguay, a small, high-income country in the Southern Cone of South America. The forestry sector represents an important economic sector and source of foreign direct investment for Uruguay which has seen exponential growth with extensive eucalyptus plantations and the installation of large-scale pulp mills. As is often the case, environmental concerns were clearly subordinate to economic ones, but nevertheless over the 30 years, in a context of permanent conflict the integration of environmental policies was a fairly continuous process. The Uruguayan forestry sector therefore represents an insightful case study for the integration of environmental policy as a nascent subsystem.

To examine the main drivers and dynamics of environmental policy integration, we have identified three time periods between 1990 and 2020 reflecting the most significant changes in the level of policy integration. For each time period, using the dimensions developed by Candel and Biesbroek (2016), we first demonstrate that a continuous increase in environmental policy integration has taken place. Secondly, we use the Advocacy Coalition Framework (ACF) to examine how the interactions between, and within, the main actors evolved to understand this change. This shows that a dominant coalition, which we name "Weak Sustainability coalition" was present throughout the three decades, but in addition a second coalition, which we call "Strong Sustainability coalition" gradually emerged and gained in strength in the 2000s. A strong understanding of sustainability gives a central place to environmental concerns, whereas a weak understanding aims at taking environmental concerns into consideration more generally (Jordan & Lenschow, 2010, p. 148). Through politicization of the environmental issues, the Strong Sustainability coalition put pressure on the Weak Sustainability coalition, who consequently changed some of their policy core and secondary beliefs regarding environmental concerns. Yet, the two coalitions continue to hold very different deep core beliefs regarding the understanding of sustainability. While there is a consensus that environmental concerns in the forestry sector need to be addressed, the Weak Sustainability coalition argues that commercial tree plantations are sufficiently regulated in

environmental terms while the Strong Sustainability coalition maintains that the way that the pulp industry has developed in Uruguay is fundamentally unsustainable. The increase in environmental policy integration has therefore not resulted in a rapprochement of the positions of the two coalitions. From our inductive analysis of this case we develop three core insights, set out in the final part of the paper, which advance the research agenda on processes of policy integration, in particular regarding the integration of nascent subsystems and the role of changing beliefs in promoting policy change toward policy integration.

Theoretical framework

Our theoretical framework serves two functions. First, it provides a framework to assess the level of environmental policy integration in Uruguay`s forestry sector and, second, it outlines key concepts to examine the drivers and dynamics of this process. To assess the level of policy integration between economic and environmental policies in the Uruguayan forestry sector over the last three decades, we use the multi-dimensional framework developed by Candel and Biesbroek (2016). In order to understand the drivers and dynamics of policy integration, we use the policy processes theory of the ACF which was designed to explain major policy change in policy subsystems.

The field of policy integration has been recognized as a literature that "(re)discovered the importance of questions dealing with the integration of new and transversal policy goals when facing complex challenges" (Cejudo & Trein, n.d., p. 1). Particularly, the framework developed by Candel and Biesbroek (2016) synthesizes fragmented accounts of policy integration into a single, more refined model to study such dynamic integration pathways. Overall, policy integration denotes a process of policy and institutional change and design. This process is agency-driven, that is different actors play a crucial role (Candel & Biesbroek, 2016; Jordan & Lenschow, 2010).The ACF describes the political process as an adversarial competition in which actors form and maintain coalitions, engage in analytical debates with learning potential and advocate for their preferred issues and policy alternatives (Henry et al., 2014).

The ACF has often been used to examine the governance of cross-sectoral conflicts and complex multidimensional policy problems, but more recently it has also been applied specifically to understand dynamics and drivers of policy integration (Howlett et al., 2017; Milhorance et al., 2021). In particular, the focus given by the ACF to policy actors and their dynamics, as well as to the incidence of external shocks and policy learning in policy change, provide elements to understand some dimensions of policy integration. In addition, the scope and level of analysis of ACF, based on coalitions and subsystems, is valuable for studying policy integration, which is a type of policy change whereby policymakers link different policy subsystems. Moreover, the focus on belief systems provided by the ACF is useful for understanding how a cross-cutting problem is perceived. As we develop in the next section, this is a relevant dimension when assessing the level of policy integration. Finally, both theoretical frameworks agree on the relevance of policy-oriented learning. While environmental policy integration is conceptualized "as a process of policy learning in which sectoral policy perspectives evolve and reframe objectives, strategies and decision-making processes towards sustainable development" (Nilsson et al., 2007, p. 158), the ACF identifies it as one of the main pathways to foster policy change.

Policy integration as a process with four different dimensions

The framework developed by Candel and Biesbroek (2016) conceptualizes policy integration as a process consisting of various elements (Candel & Biesbroek, 2016; Cejudo & Michel, 2017). Although there are dependencies and interactions between different dimensions of policy integration, the different elements do not necessarily evolve at the same time or at the same speed and they may also stagnate or regress. Specifically, the authors identify four dimensions in policy integration; policy frame, subsystem involvement, policy goals and policy instruments. First, the policy frame describes the perception of a particular problem or "an organizing principle that transforms fragmentary or incidental information into a structured and meaningful policy problem, in which a solution is implicitly or explicitly enclosed" (Verloo, 2005, p. 20). Policy integration increases when the cross-cutting nature of a problem is recognized and governance moves toward a more comprehensive approach (Candel & Biesbroek, 2016). Second, subsystem involvement captures the range of actors and institutions (as organized in coalitions) involved in the cross-cutting policy problem. Policy integration increases when there is a high level of interactions between these subsystems with frequent and formal exchanges of information and coordination (Candel & Biesbroek, 2016, pp. 218–220). The third dimension, policy goals refers to the "explicit adoption of a specific concern within the policies and strategies of a governance system, including its subsystems, with the aim of addressing the concern" (Candel & Biesbroek, 2016, p. 220). Policy integration increases when the policy goals cover the different domains included in a cross-cutting problem and when they are coherent among them. The fourth dimension, is related to policy instruments, both procedural—which determine how policy is formulated and implemented—and substantive—which directly affect the policy outcome (Bali et al., 2021). In this case, the level of policy integration is higher when there is a combination of instruments that cover all aspects and which are designed to achieve a specific set of coherent objectives, and when the instruments are included in all potentially relevant aspects and related policies (Candel & Biesbroek, 2016; Howlett & Rayner, 2007; Rogge & Reichardt, 2016).

Policy beliefs and pathways of change: concepts from the advocacy coalition framework

The basic assumption of the ACF is that actors, within the same policy subsystem, from different institutions who share the same belief system (i.e., a set of basic values, causal assumptions and problem perceptions) form advocacy coalitions to translate their beliefs into policy (Henry, 2011; Sabatier, 1988). The ACF proposes an explicit model of belief systems which are viewed as a three-tiered hierarchy of beliefs: deep core beliefs, which refers to fundamental normative and ontological axioms that define a vision of the individual, society and the world; policy core beliefs, which establish the basic strategies and policy positions for achieving deep core beliefs in the policy subsystem; secondary beliefs, which compromise a multitude of instrumental decisions and information searches necessary to implement the policy core belief (Henry et al., 2014; Pierce et al., 2017). The different coalitions holding different beliefs about particular problems interact and compete with each other.

The framework assumes that policy beliefs are usually stable over longer periods so that major sudden policy change is rare. It is assumed that these structural categories of belief

systems show decreasing resistance to change, with the deep core displaying the most, and the secondary aspects the least, resistance (Kübler, 2001). The framework focusses on periods of a decade or more. Over such a time period, policy subsystems on new issues may also become more mature (Cejudo & Trein, n.d.; Sabatier & Weible, 2007). The level of maturity is based on the stability of the beliefs of its policy participants. Mature policy subsystems are characterized by "specialized subunits within agencies at all relevant levels of government to deal with the topic", while participants "regard themselves as a semiautonomous community who share a domain of expertise" and identify the issue as a "major policy topic" (Cairney, 2019, p. 17; Sabatier & Weible, 2007, p. 192). Nascent policy subsystems are characterized by amorphous and fluid sets of beliefs (Stritch, 2015). Policy change usually happens more incrementally over time through processes of learning between actors and advocacy coalitions. Change can also be fostered by significant events which draw public attention to particular problems leading to a redistribution of key political resources and therefore a shift in the balance of power between advocacy coalitions. Such events can be internal or external shocks. In addition, the ACF identifies four main pathways of change based on these shocks. The first one is based on external factors which are disturbances that are beyond the control of the actors involved in the subsystem, including socioeconomic conditions, crises or disasters (Kübler, 2001; Sabatier & Weible, 2007). The second one relates to internal events within the coalitions, such as political scandals, new information, etc., which modifies the system of beliefs of the actors (Henry et al., 2014; Sabatier & Weible, 2007) The third pathway is based on negotiated agreements, where policy change is possible through a negotiation process between the coalitions. The fourth pathway is policy-oriented learning, where changes result from experience with the attainment or revision of the precepts of the belief system (Sabatier & Jenkins-Smith, 1993).

Case study and data collection

Forestry in Uruguay: a challenging case for environmental policy integration

In Uruguay the forestry sector has grown very rapidly over a relatively short period of time. It became one of the main export sectors of the country which has been actively and continuously promoted by governments on both sides of the political spectrum. The sector has had a marked growth for years and currently it represents about 4% of the country´s GDP, with exports of the forestry complex (wood, wood products and cellulose pulp) accounting for nearly one fifth of the country's total exports of goods (Uruguay XXI, 2021, pp. 4; 19). This was a major change from a country mainly producing meat and agricultural products and it also meant important land use changes and a reduction of Uruguay's natural grasslands.[1] The forestry sector has two main industrial sub-sectors that could be differentiated by the type of industrial transformation of the wood. On the one hand, there is the chemical transformation of wood, turning wood to pulp that in turn is used for the production of paper. On the other hand, there is the mechanical transformation of wood by sawmills located in the northeast of the country. As shown in Fig. 1 below, the first sub-sector has been growing much faster than the second the second one, especially since the 2000s. A

[1] Between 2000 and 2011, the area of natural grasslands was reduced by almost 10% (MGAP & SNRCC, 2019).

first pulp mill, managed by a Finnish company (BOTNIA/UPM), became operational in 2007, followed by a second mill (Finish-Swedish-Chilean capitals, Montes del Plata) a few years later (2014). As a result, in 2020 Uruguay became the world`s eighth largest pulp exporter.[2]

The rapid expansion of tree plantations for the pulp industry has raised a number of environmental concerns, notably soil deterioration and detrimental impacts on water systems and biodiversity (Florit, 2013; Pérez-Arrarte, 2000). The plantations consist mainly of eucalyptus monocultures that are not endemic to South America. With their expansion, along with agriculture, Uruguay has seen a reduction in the natural grasslands that are an important ecosystem in large areas of the country. In addition Uruguay also has a native forest ecosystem which is also important in terms of biodiversity, but this covers a smaller area of around 5% of the country (FAO, 2020). As outlined below, there have been various initiatives to protect the native forests and they have been much less threatened by the expansion of the forestry plantations for the pulp industry than the natural grasslands.

To address environmental concerns in the forestry sector with the rapid expansion of the pulp industry, the integration of environmental aspects into economic policies is a crucial but challenging task. On the one hand, Uruguay is in a promising position to meet these challenges. It is a high-income country[3] (Uruguayan GNI per capita in 2021 was US$ 15.800[4]) and shows a high quality of democracy[5] with a small population of 3.4 million inhabitants. In these respects, it is similar to many European countries which are the focus of much of the research in policy integration. On the other hand, Uruguay shares several challenges with other South American countries. This includes a strong economic reliance on natural resource exploitation and export with relatively little value added locally. This also holds for the pulp industry where only the first part of the processing is done locally, but the pulp is exported to be turned into paper and paper products elsewhere. South American governments on both sides of the political spectrum have struggled to break this dependence on the primary sector which puts them into a relatively weak position in the global economy (Cimoli et al., 2017). Uruguay is no exception in this regard.

Data sources

In order to assess the level of environmental policy integration over time and to examine the main dynamics and drivers of policy integration in the Uruguayan forestry sector, we conducted an inductive in-depth qualitative analysis triangulating a number of different sources. We focus on the 1990s when the Forest Law of the late 1980s began to have an impact until now because in that time the forestry sector had its most significant growth, both in the primary and industrial sub-sectors. Our data sources fall into four main categories. First, there are 35 policy documents associated with regulations,[6] such as laws, decrees, resolutions promulgated by the state through the parliament and different

[2] Available at: https://www.fao.org/forestry/statistics/80938@180724/en/.

[3] High-income economies are those with a GNI per capita of $13,205 or more (available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups).

[4] Available at: https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=UY.

[5] The Economist Democracy Index 2020 classifies Uruguay as a 'full democracy', comparable to Germany or the UK (https://www.eiu.com/n/campaigns/democracy-index-2020), for more information see also https://www.worldbank.org/en/country/uruguay/overview#1.

[6] Available at: https://www.impo.com.uy/.

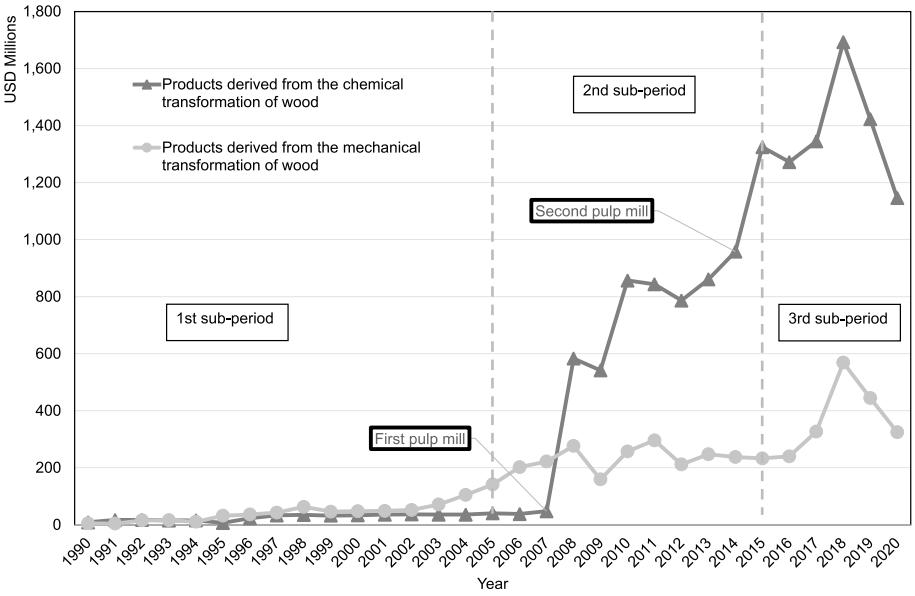

Fig. 1 Evolution of the value of Uruguayan exports in US dollars of forestry products (1990–2020). *Source:* Authors' elaboration based on data provided by FAOSTAT (http://www.fao.org/faostat/en/#data/FO)

ministries, as well as 13 policy documents associated with the government's strategy and more specific initiatives aimed to the sector.[7] Which institutions prepare these policy documents, what methodologies were used for their elaboration, what aspects are included in their content, among others, are elements that allow us to understand the degree and evolution of policy integration.

Second, transcriptions of parliamentary hearings[8] provide important information on how the different actors position themselves toward the forestry policies. On the one hand, the transcriptions from the sessions of the two chambers of Parliament, the Senators and the Representatives, are available. This includes the discussions on the laws related to the forestry sector. This allowed us to analyze the opinion of different political parties regarding the components of the laws. On the other hand, the transcriptions of the sessions of the working commissions of the Parliament are available. Different work commissions are divided by theme to study the bills that enter into the Parliament and to receive civil society representatives to present their concerns. These commissions convene technicians or associations of specialized professionals, business associations, workers' unions, NGOs, etc. These transcriptions, apart from delving into the opinion of legislators, allow mapping the civil society actors linked to the issue to be addressed by the commission and to know their opinion on the matter. We analyzed over 100 transcriptions of parliamentary hearings from five different Commissions from 1985 onward because from that year the Forest Law of 1987 began to be discussed in Parliament.

[7] Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/; https://www.gub.uy/ministerio-ambiente/; https://www.gub.uy/ministerio-industria-energia-mineria/.

[8] Available at: https://parlamento.gub.uy/documentosyleyes/documentos/versiones-taquigraficas.

Third, we conducted 19 in-depth semi-structured interviews with key stakeholders involved in the design and implementation of the relevant policies between September and December 2021. We included members of the stable technical body of the ministries and politically appointed authorities from the Ministry of Livestock, Agriculture and Fisheries (MGAP), the Ministry of Housing, Use of Land and Environment (MVOTMA) and the Ministry of Industry, Energy and Mining (MIEM). Additionally, we interviewed other actors linked to the sector who had been involved in the participatory process of designing policies to obtain their vision of the policies implemented. This includes research centers, notably the National Institute of Agricultural Research (INIA), the Faculty of Agronomy of Universidad de la República (UDELAR), an environmental NGO, as well as business representatives from the forestry sector. The interviews were essential to better understand the policy process and to triangulate and complement the document analysis. All interviews were conducted in Spanish by the first author. All interviewees quoted gave their permission for the recording and for the use of the data in the publications. The interviews were professionally transcribed and sent back to the interviewees for validation.

Finally, we examined different sector reports, mainly from the government (such as investment promotion agencies, and policy design and analysis offices) and international organizations (such as Food and Agriculture Organization (FAO), Economic Commission for Latin America and the Caribbean (ECLAC) and International Labour Organization (ILO), to have an additional source of the arguments of the different stakeholders regarding the sector and to complement the mapping of actors to be considered as well as media articles, the websites of organizations linked to the sector and publications on social networks. This allowed us to better understand the opinions of different stakeholders, including civil society organizations, regarding how economic and environmental aspects are contemplated in the forestry sector.

Methodologically, we used a theoretically informed, inductive approach to identify the patterns of policy integration that emerged from the different sources of information. Using the framework provided by Candel and Biesbroek (2016) we identified three main periods with significant changes in the level of policy integration of environmental and economic policies in the Uruguayan forest sector since 1990. The first runs from when the Forest Law was first implemented, 1990, until 2004; the second runs from 2005 to 2014 and the last starting in 2015. Further, we used the ACF framework as a heuristic to better understand the main drivers and dynamics behind these processes. Overall, our analysis mainly focusses on the design phase of policy integration but to a smaller extent also discusses the agenda-setting phase.

1990–2004: setting new policy goals: the economic promotion and rapid expansion of forestry as a new sector

The first period is characterized by a low level of integration where economic issues clearly dominates over environmental ones. Nevertheless, environmental policies are not completely absent and new institutions and regulations associated with environmental aspects were established throughout the time period. However, these actions were not necessarily carried out in an integrated manner with forestry policies. During this period, the forestry policy that prevailed was the Forest Law approved in 1987. This law centralizes and encompasses the strategy of the forestry sector during this period. The law was important to advance the priorities of the economic aspects because it strongly promoted the forestry

sector through subsidies and tax exemptions (ILO, 2018). The environmental consideration was present through the protection of native forests, through a logging ban, tax incentives to conserve them and the creation of a specific Unit in the General Forestry Directorate (DGF) in the MGAP (Pou, 2016). Additionally, within the entire Uruguayan territory, this law establishes which areas are suitable for tree planting ("forest priority soils") and directs economic incentives to these areas (Parlamento del Uruguay, 1987, sec. 5, art. a)).

The low level of integration of environmental aspects in forestry policy is also reflected in the institutional set-up where the economic dimension also predominates. The MGAP, through its DGF, is in charge of all aspects of the forestry policy. Both the economic aspects (tax exemptions and subsidies) and the environmental ones (native forests, forest priority soils), among others, were the responsibility of MGAP.[9] Additionally, at the state level, during this subperiod the first steps in the creation of institutions and regulations related to environmental issues were just being taken, with the creation of a National Environmental Directorate[10] (DINAMA) within the MVOTMA in 1990[11] and the Environmental Impact Assessment Law in 1994.[12] According to OPP et al. (1992), institutional gaps had been identified in the operational structure of the MVOTMA, where there was a lack of institutionalized horizontal technical relations, a lack of instruments to coordinate environmental policy through the competent institutions and a need to strength the regulatory framework for coherent and coordinated institutional action, including the participation of private organizations. Likewise, in 2003, a representative of the international civil society organization World Rainforest Movement, at a hearing of the Parliament Environment Commission, on the occasion of the future installation of a pulp mill, questioned the State`s capabilities to carry out real, effective and daily monitoring of the pulp mill`s liquid and gaseous effluents and doubted that the necessary resources and technicians were available to do so.

In terms of the policy frame dimension, although some environmental aspects are considered, the sustainability of the forestry sector is not yet recognized as a cross-cutting problem. Forestry development is predominantly seen as an economic concern. There is no push to integrate the environmental subsystem. Regarding the dimension of policy goals, this subperiod shows that concerns are mainly embedded in the economic subsystem. Although there are environmental objectives such as those mentioned, they do not have a cross-cutting logic. As for the integration of policy instruments, as mentioned above, in this period policy instruments of both aspects were identified, although the environmental ones are not sufficiently comprehensive. Despite this consideration of environmental policy instruments, statements by members of the environmental critics point out that these are not consistent with the objective of the Forest Law (Hernández Texeira, 2011). Consequently, policy integration initiatives are not undertaken and policy subsystems keep working around their sector-specific policies (Cejudo & Trein, n.d.).

[9] The main objective of MGAP is the economic development of the agricultural, forestry and livestock sectors.

[10] Institution that rules and centralizes the environmental control of the economic activities.

[11] Available at: https://www.impo.com.uy/bases/leyes/16112-1990.

[12] Available at: https://www.impo.com.uy/bases/leyes/16466-1994.

The dominance of the weak sustainability coalition and the gradual emergence of the strong sustainability coalition

One of the main reasons for the low level of integration of environmental aspects into forestry policy was that environmental concerns were just beginning to gain attention on public agendas in Uruguay and a strong environmental advocacy coalition was almost absent in the early 1990s. This also reflects international developments where environmental concerns started to gain visibility, particularly with the United Nations Conference on Environment and Development held in Brazil in 1992 (Siegel, 2017, pp. 34–43). Internally, during that time Uruguay had just emerged from a dictatorship that had suppressed trade unions and other types of social organization, so rebuilding organized social movements was a challenge.

In contrast, during that period the Weak Sustainability coalition was already established and had the resources to be the dominant coalition leading the design of forest policy. The Weak Sustainability coalition prioritizes economic growth as their main deep core belief. The Weak Sustainability coalition envisioned the development of the forestry sector as a new economic activity to boost the country's economic growth, with environmental aspects being considered only marginally. The main objectives of this coalition were to generate a new export sector and achieve self-sufficiency in wood and energy. The protection of the native forest, as the main element of environmental policy integration is mostly a response to the strong degradation of native forests in the previous years. The main policy core belief was to promote commercial tree planting with economic incentives, notably tax exemptions and subsidies.

In Uruguay this coalition is integrated mainly by business chambers, international organizations and public institutions. International organizations such as FAO, United Nations Development Program, Organization of American States (OAS), World Bank and Japan International Cooperation Agency (JICA) have been assisting the Uruguayan government technically and granting loans for the design and implementation of the Forest Law. However, the principal external catalyzing agents for industrial plantation development in Uruguay were JICA and the World Bank (Carrere & Lohmann, 1996; Pérez-Arrarte, 2000). The Society of Forestry Producers stands out among the private sector stakeholders. Since its creation in 1959, it has been the main organization representing companies in the various stages of the forestry chain. It is also recognized for its ability to maintain frequent contacts with government agencies (Hernández Texeira, 2011). Another active association speaking for forest development was the Agricultural Engineers Association which tried to enhance the importance of forest as a whole and its biological functions and important interactions with other production systems (Normey, 2012). Both organizations were consulted in the forestry legislation process. Finally, as the last relevant policy actor in the Weak Sustainability coalition, we identified the MGAP. This Ministry has led the design and implementation of the Forest Law during this subperiod. Although the MIEM was consulted during the legislative process of the Forest Law, it did not have the same relevance as the MGAP. Likewise, the newly created MVOTMA did not have enough strength to play a more active role.

It was not until the end of the 1990s and the beginning of the twenty-first century that an incipient Strong Sustainability coalition linked by a common set of beliefs could be identified. In the early 1990s, the first to question the forestry model that was being promoted were researchers from academia. These studies analyzed and displayed the different issues where changes in land use would have an impact and pointed out possible modifications

in the hydrological cycle. In this way, the need to carry out local research and to establish a territorial planning of the new plantations that would protect those watersheds of a strategic nature was proposed (Panario & Gutiérrez, 2007; Pérez Arrarte, 2007). In the case of environmental NGOs, those concerned with the forestry sector emerged in a non-formalized way in towns near tree plantations or in response to announcements of possible investments in new pulp mills (Graziano, 2010b; OPP et al., 1992). It was not until the end of the 1990s that more institutionalized environmental NGOs began to be created with the aim of bringing together people and organizations concerned about the conservation of native forests and the socioeconomic and environmental impacts of the forestry plantations promoted since the late 1980s (Gautreau, 2014; Pérez Arrarte, 2007).

Based on the strengthening and grouping of environmental NGOs, as well as the trajectory and involvement of those academics who have researched the environmental impact of commercial forestry, at the end of this subperiod it is possible to identify the origin of a Strong Sustainability coalition of policy actors who share the preservation and regeneration of ecosystem services and biodiversity as their deep core belief. In the same way, they share as a policy core belief, a strategy that safeguards the country`s traditional agricultural activities, as economic activities that better preserve the pampas biome than commercial forestry (Pérez-Arrarte, 2000). In addition, this coalition promotes environmental debates and plays an active role in the design of public policies aimed at the forestry sector. These actions include lobbying for a study of the environmental impact of commercial plantations[13] and participation in parliamentary hearings related to pulp mill investment announcements in the early 2000s.

These coalitions and their dynamics demonstrate the importance of strong coalitions to generate a debate that feeds public policies. While secondary beliefs of the Weak Sustainability coalition included, on its own initiative, the protection of native forests as a key environmental aspect in this time period, the questioning of the impact of commercial tree plantations and their inclusion in the Uruguay's policy framework was a consequence of the strengthening of the Strong Sustainability coalition. Today's Weak Sustainability coalition stakeholders (such as INIA,[14] MIEM[15] and the private sector[16]) claim that long-term data adjusted to local realities are needed to assess the environmental impact of commercial forestry, but it was the Strong Sustainability coalition that initiated this type of research. Overall, there were few interactions between the two coalitions in this time period and only toward the end when the Strong Sustainability coalition was taking shape. The near absence of a Strong Sustainability coalition meant that the issue of environmental integration in forest policy was not politicized. It was not until the early 2000s, when the Strong Sustainability coalition began to strengthen, that the issue began to receive public attention and opinion began to polarize and expand to more actors and audiences (de Wilde et al., 2016).

[13] At the end of the 1990s, the DGF and INIA promoted for the first-time environmental impact studies of forestry plantations. Likewise, the faculties of Agronomy and Engineering of the University of the Republic began to carry out research projects on the same subject. (Pérez Arrarte, 2007; Pérez-Arrarte, 2000).

[14] Online interview (15/10/2021), INIA 01.

[15] Online interview (23/08/2021), MIEM 01.

[16] Online interview (8/09/2021), Private Sector 01.

2005–2014: the acceleration of policy integration and the external shock of the pulp mill dispute

The second period is characterized by a jump in the level of environmental policy integration as additional environmental aspects were included in the forestry policy. These modifications respond to regulatory, financial and institutional modifications that considered environmental aspects. In this period the forestry sector changes significantly as the pulp sector expands rapidly following an exponential increase in forestry plantations providing the necessary raw materials in the previous decade.[17] In this context, economic and environmental aspects, take on greater significance and there is a broader consensus, particularly within the Weak Sustainability coalition, that both aspects should be considered in the governance of the forestry sector.

This is evidenced in how MGAP, while remaining in the Weak Sustainability coalition, began to consider environmental aspects in its policy instruments within the framework of the Forest Law. Most importantly, the MGAP adjusted the policies concerning the designation of forest priority soils to cover a broader range of environmental aspects. During the previous period several decrees were approved to expand the area of forest priority soils. In this way, according to an interview from DGF-MGAP,[18] the environmental purpose of the soil categorization was weakened, by allowing commercial afforestation on soils that were not originally forestry priority. Moreover, new measures were implemented, including the regulation of the Environmental Impact Assessment Law, the participation of DINAMA in the evaluation of forestry projects in those cases that exceed 100 ha, the application of the National System of Protected Areas (SNAP),[19] and the design and implementation of the Use of Land Law.[20] These new actions required the coordination between the two main departments, within the Weak Sustainability coalition, involved in the approval of forestry projects, the DGF of the MGAP in charge of the agronomic aspects of the projects and the DINAMA of the MVOTMA in charge of the environmental aspects of them. According to interviews with the DGF[21] and DINAMA,[22] coordination was possible due to affinity, politics and trust. This is justified by the fact that apart from both belonging to the same party (in the previous government the directors were from different political parties that formed a coalition to govern), they were professional colleagues and shared the same vision for the development of the sector.

On the other hand, the actions and tools within the economic domain were sharpened and modified. The subsidies to plantations were eliminated and the tax exemptions were differentiated according to the type of tree planted to promote the development of alternative industrial activities besides the pulp production and silvopastoral[23] activities (Alvarado, 2007; Berterreche, 2006). Thus, from a policy frame point of view, there is an increased awareness that forestry development must contemplate economic and

[17] The forested area went from 45 thousand hectares in 1990 to 715 thousand hectares in 2005 (Hernández Texeira, 2011).

[18] Interview (Montevideo, 11/11/2021), MGAP 01.

[19] The SNAP had been created by law in 2000 (https://www.impo.com.uy/bases/leyes/17234-2000) but was only implemented in 2005 (https://www.impo.com.uy/bases/decretos/52-2005).

[20] Available at: https://www.impo.com.uy/bases/leyes/18308-2008.

[21] Interview (Montevideo, 11/11/2021), MGAP 01.

[22] Online interview (11/11/2021), MVOTMA 01.

[23] Production system that combines forestry and livestock production.

environmental aspects. The environmental subsystem takes on a prominence that it did not have before and in coordination with the economic ones. This means that there is a diversification in the policy goals, where new environmental objectives are added, which leads to a higher level of environmental policy integration compared to the previous period. The same happens with the policy instruments, where the quantity and significance of substantive policy instruments related to the environmental concerns were increased. Likewise, there are procedural policy instruments such as impact assessments and interdepartmental working groups which allow greater coordination between the environmental and economic subsystems. The common objective of these instruments, both substantive and procedural, leads to consistency between them. This period has thus witnessed policy integration where "policy capacities are loosely coupled" (Cejudo & Trein, n.d.), mainly because of arrangements between different Ministries (MGAP and MVOTMA) agree to work together and share information.

Changing beliefs through domestic political change and external disturbance

The main reasons for this increase in the level of environmental policy integration are internal changes within the coalitions and an important external disturbance. Together this has led to changes in the policy core beliefs and the secondary beliefs particularly of the Weak Sustainability coalition. On the one hand, in 2005, the Frente Amplio, a center-left political party assumed the presidency of Uruguay for the first time. On the other hand, the main foreign investments in the industrial stage of the forestry chain were made during this period. The most important of these was the investment in a pulp mill by a Finnish company, which represented the largest private investment in the history of Uruguay.

These two main changes had a significant effect on the Weak Sustainability coalition, while the composition of the coalition remained the same. The government, represented in the Weak Sustainability coalition through the Ministries with competence in the forestry sector (MGAP, MVOTMA, MIEM), was now integrated by a political party that previously clearly supported the Strong Sustainability coalition. Before taking office, parts of the Frente Amplio supported social movements against monoculture tree plantations and demonstrated against investments in pulp mills. However, once in government, and during the following two administrations (2010–2015 and 2015–2020) it shifted and supported the forestry sector, but with a stronger emphasis on taking environmental concerns into account (Alvarado, 2007; Graziano, 2010a; Recoba & Pena, 2020). Indeed, during the two terms of government, and consequently during the last two subperiods of our analysis, the government could be classified as a policy broker acting in the sense of reaching reasonable agreements that reduce the intensity of conflict between the two coalitions. Likewise, during this period, the representation of the private sector in the Weak Sustainability coalition was led by the Finnish company that invested in the pulp mill (BOTNIA/UPM). The magnitude of the investment and its impact made the Finnish company a key player in the Weak Sustainability coalition. It acquired a great capacity to recruit university professionals trained in environmental management and ecology, capable of producing an environmental discourse that allowed them to continue operations with decisive support in the political and economic elites. This allowed them to negotiate the regulatory frameworks for their own activity with the public administration (Gautreau, 2014). International organizations became less relevant during this period. Their role is generally reduced to technical assistance to the state, without an active role in forest policy.

In the case of the Strong Sustainability coalition, environmental NGOs were strengthened and focused their efforts against the development model based on the cellulose industry. There was more environmental knowledge regarding forest plantations (Gautreau, 2014) and since the mid-2000s environmental NGOs were active and consolidated with the support of international organizations. Alvarado (2007) identifies two groups within the environmental NGOs based on different activist strategies. One group of NGOs had a higher media profile, focused on public denunciation, and was financed by European organizations, integrated by Grupo Guayubira and REDES—Amigos de la Tierra (the Uruguayan group of Friends of the Earth). The other group was composed by the Network of Environmentalist NGOs of Uruguay, formed by numerous small organizations located mostly outside the country's capital, and of a more voluntary nature. Two major organizations stand out that also receive foreign financing, the Latin American Center for Social Ecology and the Uruguayan Center for Applied Technologies.

These internal and external changes also had an impact on the dynamics of the coalitions. On the one hand, the proximity of the new governing party to the Strong Sustainability coalition allowed for certain pre-electoral commitments from the government (CADESYC, 2004), including some environmental concerns to the development of the forestry sector. On the other hand, the arrival of the pulp mill investment was a catalyst in the dynamics of both coalitions. Uruguay clashed diplomatically with its neighbor Argentina over the installation of the pulp mill on a river forming the border between the two countries. Consequently strong civil society opposition formed on the Argentinean side, which resulted in several high-level international protest campaigns and led to a legal dispute that was eventually resolved through a ruling of the International Court of Justice in The Hague (Siegel, 2021). The duration and severity of the civil society opposition to the pulp mill and the diplomatic consequences was a novelty. This external disturbance had an impact on different actors in Uruguay and resulted in greater attention to environmental concerns and facilitated policy integration of the environmental and the economic aspects.

For instance, the DINAMA was challenged at the institutional and regulatory level since the previous controls and regulations were very weak. The international visibility of the pulp mill dispute helped the public agencies involved to obtain more attention and support from the government and the political system. As two interviewees from the MVOTMA[24] noted, during this period, this Ministry was institutionally strengthened through human and financial resources allocated to the DINAMA. The dispute thus made it possible to require companies to install environmental requirements from their country of origin and many policy instruments were adjusted based on this. Overall, the dispute fostered an upgrading in the technology used and the mills in Uruguay in fact use much more modern and less environmentally harmful technologies than other mills in neighboring countries and elsewhere (Dudek, 2013). At the same time there was a more regular exchange[25] between the two coalitions, allowing the incorporation of new environmental aspects into forest policy.

As a result of this shift in the governing party and the external pressure from the pulp mill dispute the Weak Sustainability coalition adjusted its belief system in favor of more environmental policy integration. In relation to secondary beliefs this included changes in regulations for the categorization of forest priority soils and the implementation of environmental impact assessment control. In terms of policy core beliefs, the strengthening of the MVOTMA and the implementation of strategic policies such as Use of Land Law and

[24] Online interviews (11/11/2021, MVOTMA 01, and 12/11/2021, MVOTMA 02).

[25] Formally, part of the Strong Sustainability coalition participated in the pulp mill monitoring commission. Informally, the Strong Sustainability coalition was consulted in the government program.

the SNAP are relevant changes in the Weak Sustainability coalition strategy. In addition, the Strong Sustainability coalition was consolidated and had greater resources and prominence during this period. Despite these significant changes in the degree of environmental policy integration, it is important to note that the pulp industry continues to expand, both through new eucalyptus plantations[26] and the installation of new pulp mills, during this and the following period.

2015-ongoing: negotiated agreement and changing conceptions of sustainability in the forestry sector

In the third time period there is no substantial increase in the level of environmental policy integration, but the level of integration so far is maintained and consolidated with new institutional configurations and policies of a more strategic nature, notably the development of long-term development and environmental policies, of a systemic nature, which include and promote the forestry sector within them. Additionally, during this period the government negotiated the conditions for the installation of the third pulp mill in the country with the same company that installed the first mill (UPM). This crystallized and reinforced the coalitions' positions and their belief systems.

During this period, at least nine plans, programs and other policy instruments[27] can be identified related to environmental policy linked to the forestry sector. In general terms, all these plans recognize native forests as a component of biological diversity and, together with commercial tree plantations, identify them as a way to mitigate climate change through carbon sequestration. It is also noteworthy how these plans recognize the impact of forestation on the hydrological system. All of them are characterized by a participatory process, where different stakeholders, such as civil society organizations, universities and local governments were consulted during the design stage. New institutional entities for inter-ministerial coordination were also created. Particularly, in 2016 the National Environmental System (SNA) was created, which was integrated by all Ministries and State agencies linked to environmental issues, and was led by the Presidency of the country.

Moreover, there is a shift in terms of how sustainability in the forestry sector is conceptualized. In the National Development Strategy Uruguay 2050, the future of the forestry sector is conceived as a forest-based bioeconomy (OPP, 2018, 2019a, 2019b; Popper et al., 2020). A central idea behind the bioeconomy concept is to replace fossil resources with biological ones and to promote sustainability and circularity (Dietz et al., 2018; Förster et al., 2021; Stark et al., 2022). The pulp industry in Uruguay has moved in this direction to some extent by using waste products from the production of pulp to generate energy (Siegel et al., 2022, pp. 6–8). Furthermore, for the third pulp mill to be installed in the country, since the beginning of the third government of the Frente Amplio in 2015, negotiations began between the government and UPM to set the conditions for the development of the investment (the agreement reached was published in 2019[28]). Compared to what was agreed with the two previous plants, more emphasis was placed on supplier development, infrastructure, labor conditions and energy. As a novelty, aspects such as environment,

[26] Between 2005 and 2015, total area of commercial tree plantations increased by 37% (FAO, 2020).

[27] See Appendix 1.

[28] Available at: https://www.gub.uy/presidencia/institucional/normativa/resolucion-n-399019-se-aprueba-proyecto-contrato-complementario-0.

water management, regional planning, research and innovation—all related to bioeconomy—were incorporated (República Oriental del Uruguay & UPM, 2017). The conditions for the installation of the new pulp mill therefore incorporate aspects which were only timidly contemplated or totally ignored in the negotiations of the two previous mills. In this context, the government has always prioritized foreign investment, infrastructure development, employment generation and social and economic development, considering that the possible polluting effects of the new pulp mill can be controlled through appropriate mechanisms by the State (Fry & Arocena, 2021, p. 223). However, the government is still criticized by some regarding the lax conditions and the excessive benefits granted to the company, as well as certain irregularities in the contract negotiations between the Uruguayan government and UPM (Bacchetta et al., 2019; Interview MGAP 01). In this regard, several organizations that are part of the Strong Sustainability coalition have submitted in 2018 a petition to annul the contract with the pulp mill before the Presidency and Parliament, all without success. Consequently, since 2020, signatures are being collected to hold a plebiscite on the matter in 2024 alongside the national elections.

In sum, the level of integration of the policy frame was increased by promoting the development of a sustainable forestry sector from a more comprehensive approach. In terms of policy goals, the development of overarching strategies, "integrated policies strategies" in terms of Cejudo & Trein (n.d.), has allowed forest policy to share objectives with a wider range of areas and in a coherent manner. Regarding the policy instruments, in this period the procedural policy instruments had a strong importance. All the overarching plans and strategies, and the protagonism of the SNA and consultation mechanisms provide evidence of this. Changes in policy integration during this period are mainly reflected in the incorporation of procedural policy instruments, the strengthening of the environmental dimension in government policies, and the new conceptualization of the forestry sector. Consequently, during this period "integrative policy capacities" (Cejudo & Trein, n.d.) were developed by enabling intersectoral programs (some of the aforementioned plans) and coordination bodies (SNA).

Persisting opposing deep core beliefs despite participatory processes and new conceptualizations

This time period has witnessed an expansion of the Strong Sustainability coalition in that new actors were added to the existing environmental groups. The Movement for a Sustainable Uruguay (MOVUS) is also an environmental NGO with a higher media profile and focused on public denunciation. The Citizenship Movement “UPM 2 NO” and the National Coordination against UPM were both created as a consequence of the announcement of the third pulp mill in the country. Although these new organizations were formed, to the membership often overlaps and is part of existing NGOs in the Strong Sustainability coalition. Furthermore, a group of researchers from different areas (geography, sociology, etc.) has emerged to generate resources and mobilize around the forestry sector. They are an active actor through publications, participation in workshops and their attendance at parliamentary hearings. Although the composition of this coalition was modified, the belief system remained stable.

Our analysis shows an increased participation of the expanded Strong Sustainability coalition in the Uruguayan policy processes. Indeed the above-mentioned policy documents involved a significant number of people, including representatives of all state agencies, academia, environmental NGO networks, sectoral business associations and trade

unions (MVOTMA & SNA, 2019). The participatory mechanisms facilitated a learning process and allowed the Weak Sustainability coalition to come closer to the Strong Sustainability coalition. The resulting policies can be considered a negotiated agreement.

However, there also was dissatisfaction and questions about the participatory nature of these processes (MVOTMA & SNA, 2019). In particular, the agreement between the government and UPM for the third pulp mill was excluded from them. In this regard, the Strong Sustainability coalition demanded that the agreement should have been debated in parliament, citing the country`s constitution. These developments reflect that despite an expanding Strong Sustainability coalition, the Weak Sustainability coalition has been able to consolidate their policy frames in the last period (2015-ongoing). The same government remained in office until 2020, allowing it to strengthen its approach to forestry policy. The cellulosic model thus continued to expand. The second pulp mill went into operation. Investments in the third mill were announced and the pulp companies remain crucial actors in promoting the cellulosic model.

Ultimately, the two advocacy coalitions continue to hold contrary deep core beliefs with regards to what sustainability in the forestry sector should mean despite a clear increase in environmental policy integration since the early 1990s. Whereas one coalition seeks to regulate the pulp industry and associated forestry plantations better, but maintain it, the other one rejects the pulp industry as a whole. As the second view is gaining strength the issue is becoming increasingly polarized. Meanwhile, the pulp sector continues to dominate. Initiatives to strengthen mechanical wood processing have not been as successful as chemical wood processing and the expected results have been leaner or slower. Moreover, economic problems in the forestry sector, such as the survival of small and medium-sized enterprises, access to forests or transportation costs are still given priority over environmental concerns (Fry & Arocena, 2021). The government changed in 2020 and after 15 years of a center-left alliance government, a conservative government came into power. So far, this has not resulted in drastic changes although there have been some changes on regulatory issues in the forestry sector. It remains to be seen how the different advocacy coalitions interact in the new political context and what the implications are for policy integration (Table 1).

Conclusion and core insights

Our analysis has demonstrated that environmental policy integration in the Uruguayan forestry sector has increased continuously since the 1990s. Particularly during the 2000s the integration of environmental policies has accelerated, driven by the Frente Amplio alliance government and the pulp mill dispute with Argentina. Generally, there now is a consensus that environmental concerns in the forestry sector need to be addressed. However, over the last three decades two main advocacy coalitions have crystallized with fundamentally different deep core beliefs as to how this should happen. While one coalition argues that commercial tree plantations are sufficiently regulated in environmental terms, the other coalition maintains that the way that the pulp industry has developed in Uruguay is fundamentally unsustainable and therefore seeks to change the forestry sector as a whole. However, policy integration steadily increased due to compromises reached on policy beliefs and secondary aspects, and despite persistence of opposing deep core beliefs that maintain a fundamental opposition between strong and weak understandings of sustainability.

From our inductive analysis of environmental policy integration in the Uruguayan forestry sector, we can derive insights that specifically address the integration of nascent subsystems and, drawing from the ACF, the role of changing beliefs in fostering policy integration. These insights add to the framework set out by Cejudo & Trein (n.d.) and they can be tested and adjusted in other case studies and therefore provide an important avenue for further research. All three core insights assume that through interactions and processes of learning actors can change their positions and this in turn can lead to policy change toward policy integration.

Our first insight is:

The integration of a nascent subsystem increases when the dominant advocacy coalition changes its policy beliefs.

Theories of policy integration need to account for how the sectoral logic that generally characterizes policy making is overcome. This question is even more pertinent where a nascent subsystem becomes integrated into a mature one. In our case with internal political changes and an external disturbance the dominant Weak Sustainability coalition began to consider environmental aspects in its policy instruments and later integrated them into overarching strategies and plans. The change of government, with a party that previously supported the Strong Sustainability coalition, as a new policy broker, and the installation of the first pulp mill were the main drivers of this integration. This reaffirms the conclusion of Cejudo & Trein (n.d.) that "if policy brokers make policy integration a priority, the likelihood of integrative policy capacities increases". Changes in the belief systems of actors and in particular of the most influential actor coalitions are an important element which deserves more attention in further research.

Our second insight is:

A minority coalition can gain in strength when the international salience of their beliefs increases.

This insight is related to the first one, but it focusses specifically on how international events can trigger a process toward policy integration. International salience increases the politicization of a policy problem through civil society activism and protests, but also through a problematization of a policy issue in international summits and conventions. In our case, the building of the first pulp mill led to a diplomatic conflict with Argentina that brought more attention to environmental aspects and consequently strengthened the Strong Sustainability coalition.

Finally, our third insight is:

Participatory processes can foster interactions between opposing coalitions which lead to converging policy beliefs, but changes in deep core beliefs are rare.

Our analysis suggests that participatory approaches are important for fostering debate among different coalitions and this may support processes of learning and negotiated agreement. This in turn can lead to a convergence of beliefs which supports policy integration. This confirms findings of previous studies. As Milhorance et al (2021) also demonstrate, policy design through open, participatory processes, which take the form of overarching plans, are factors that promote the reaching of negotiated agreements. This is reinforced when these processes are led by hierarchically higher institutions. In

Table 1 Scheme of dynamics and drivers toward policy integration

Subperiod	Dynamics and drivers
1990–2004	Absence of an environmentalist coalition Dominant and established Weak Sustainability coalition
2005–2014	Change of government, where a center-left party took office for the first time Diplomatic conflict with Argentina over the first pulp mill installation Strong Sustainability coalition strengthened and focused its effort against the cellulosic model Weak Sustainability coalition had pre-election agreements with the Strong Sustainability coalition DINAMA strengthened with human and financial resources Visibility of the diplomatic conflict between coalitions committed the Weak Sustainability coalition to greater control of environmental aspects in the sector
2015–on going	Expansion of the Strong Sustainability coalition Prominence of participatory mechanisms in the design of public policies Involvement of the Strong Sustainability coalition in participatory public policy processes Dissatisfaction and questions about the participatory nature of these processes

our case, the government actors within the Weak Sustainability coalition promoted the inclusion of different stakeholders, at first to monitor the activities of the pulp mills and then to participate in the design phase of the strategies and plans where environmental aspects are considered. Both processes were led by high-level institutions, as a Ministry of the Executive Branch (in this case the MVOTMA) and a Cabinet of Ministries (in this case the SNA). Yet, our analysis also suggests that finding a political consensus through such participatory processes requires longer time periods and is unlikely to be achieved in just a few years.

Overall, our analysis brings a new South American case study to the literature on policy integration which has focused mostly on industrialized countries in Europe or North America. From our inductive analysis we have derived three insights to advance research agenda on the processes of policy integration. Our insights particularly seek to develop a better understanding of how nascent subsystems become integrated into mature ones and the role that changing beliefs of advocacy coalitions play in fostering policy change and integration.

Appendix

Appendix 1: List of plans, programs and other policy instruments related to environmental policy

Year	Plan/strategy	Relation with forestry sector
2016	Biodiversity Strategy[29]	Native forests as one of the five Uruguayan components of biological diversity Forest Law as a policy instrument to protect native forests Commercial tree plantations do not have a negative impact on biodiversity
2017	National Climate Change Policy[30]	Native forests as a way promote the conservation, recovery and restoration of natural ecosystems, and the provision of ecosystem goods and services Afforestation (commercial and non-commercial) as a way to promote the reduction of greenhouse gas emissions and the increase of carbon sequestration
	Nationally Determined Contribution (NDC)[31]	Forestry sector as central in the contribution to the mitigation of climate change Projected growth in carbon sequestration through afforestation Promotes the silvopastoral to neutralize methane emissions
	National Water Plan[32]	Recognizes that the main tree species planted are well adapted to the hydrological regime Identifies controversies about the impact on soil and water resources as a consequence of the afforestation expansion Implement a program to monitor the lack of information on the impact of the forestry chain on water resources

[29] Available at: https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/documento-estrategia-nacional-biodiversidad-2016-2020.

[30] Available at: https://www.gub.uy/ministerio-ambiente/sites/ministerio-ambiente/files/documentos/publicaciones/Politica_CC_1.pdf.

[31] Available at: https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Uruguay/1/INDC%20Uruguay%20(English-unofficial%20translation).pdf.

[32] Available at: https://www.gub.uy/ministerio-ambiente/politicas-y-gestion/planes/plan-nacional-aguas.

Year	Plan/strategy	Relation with forestry sector
2018	National Strategy on Native Forests[33]	Strategy toward qualitative and quantitative sustainability focused on forest ecosystem services
	National Agroecology Plan[34]	Promotes the conservation and utilization of indigenous genetic resources (including native forests) and recognizes the rights of farmers to reproduce them and ensure their availability Proposes to generate specific policies for agroforestry
2019	Agriculture Adaptation Plan[35]	Establish adaptation measures, such as sustainable management of forest plantations, sustainable management of native forest, other native forest formations and native trees outside forests
	National Environment Plan[36]	Incorporates the National Biodiversity Strategy Develops and updates the framework for native forest conservation Recognizes the forestry expansion as one of the causes of biodiversity loss Set as a goal the promotion of sustainable production practices that reduce the environmental impact of agricultural/silvicultural activities Recognizes forestry sector promising for Uruguay`s long term development Set as a goal the territorial planning tools as a way of coexistence of economic activities, other human activities and ecosystems in rural areas, considering it as a way to maintain and improve the quality of life of the population, social integration in the territory and the environmentally sustainable and democratic use and exploitation of natural resources and cultural
2021	Long-term climate strategy for Uruguay[37]	Reinforces 2017 commitments at the NDC in the long term Establishes to maximize carbon capture in 2050 based on the increase in the area of native forests, silvopastoral systems and the expansion of the forested area

Authors' contribution DK contributed to conceptualization, investigation, methodology, project administration, resources, writing—original draft, and writing—review and editing; KMS contributed to conceptualization, methodology, project administration, supervision, writing—original draft, and writing—review

[33] Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/comunicacion/publicaciones/estrategia-nacional-bosque-nativo.

[34] Available at: https://www.gub.uy/ministerio-ganaderia-agricultura-pesca/politicas-y-gestion/planes/plan-nacional-para-fomento-produccion-bases-agroecologicas-cpna-0.

[35] Available at: https://www4.unfccc.int/sites/NAPC/Documents/Parties/NAP%20Agriculture%20Uruguay.pdf.

[36] Available at: https://www.gub.uy/ministerio-ambiente/comunicacion/publicaciones/plan-nacional-ambiental-para-desarrollo-sostenible.

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and editing; LP contributed to investigation, methodology, resources, and writing—review and editing; TD performed funding acquisition, supervision, and writing—review and editing.

Funding Open Access funding enabled and organized by Projekt DEAL. This work was supported by the German Federal Ministry of Food and Agriculture (BMEL) (Grant Number 2219NR291) and the University of Münster through the research project 'Transformation and Sustainability Governance in South American Bioeconomies'.

Declarations

Ethical approval The sources of the documents used for the qualitative analysis are provided in the paper and they are openly available at the websites indicated. The full interview transcripts cannot be made available for confidentiality and data protection reasons. All interviewees cited in the text have given permission to record the interview and to use the data in publications, including giving the name of the organization. All interviews were carried out in Spanish by the first author. The interviews were professionally transcribed and sent back to interviewees for validation.

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