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# A Regional Response to a Global Problem: Single Use Plastics Regulation in the Countries of the Pacific Alliance

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**Abstract:** Unsustainable production and consumption patterns of single use plastics are causing worldwide negative environmental and socioeconomic impacts on land-based and marine ecosystems. Nevertheless, in Latin America, plastics governance is still fragmented across borders because of dispersed normative adoption and limited regional coordination. In this context, the instrumental level of articulation between the international principles of environmental law and the formal legal arrangements from the Pacific Alliance countries is assessed to analyze how this strategic platform can contribute to offering a regional response to the global problem of single use plastics. For this purpose, an illustrative case study of the national and subnational regulation developed by the Pacific Alliance and its members was performed. To this end, a framework analysis was conducted on the official legal documents from Mexico, Colombia, Chile, Peru, and Ecuador. The results show extensive and scattered subnational regulation to control the consumption of plastic bags and single use plastics, with diverse policies on extended producer responsibility, educational and economic strategies to influence mainly the consumer's behaviour. Recommendations are presented in order to improve plastics governance in the region through the legal component.

**Keywords:** plastics governance; Pacific Alliance; international environmental law; regional coordination

## 1. Introduction

The production of plastics has increased twentyfold since the 1960s [1], reaching 280 million tons in 2016 [2]. This poses serious concerns regarding the capability to cope with the amount of plastic we generate, in terms of natural systems' degradation and impacts on human health [3]. According to recent estimates, 79% (In general, globally most waste is currently dumped (33%) or disposed of in some form of a landfill (37%) [4].) of the plastic waste ever produced now sits in landfills, dumps or in the environment, while about 12% has been incinerated, and only 9% has been recycled [5]. Therefore, by 2050, there will be around 12 billion tons of plastic litter in landfills and the environment [6], which will account for 20% of total oil consumption and 15% of the global annual carbon budget [7].

In this context, single use plastics (SUP) play a critical role because they represent around one-third of the plastic produced [8]. Actually, in the case of the European Union (EU), 50% of marine litter was found to be SUP [9]. SUP present several challenges for end of life (EoL) treatment: SUP are disposable,

generally difficult to recycle due to the complexity of chemical additives [10], and made of low-density plastic polymers so they float in the oceans [11], becoming a potential risk for marine organisms [12,13].

In a business-as-usual scenario, the ocean will contain 1 tonne of plastic for every 3 tonnes of fish by 2025, and by 2050, more plastics than fish [7]. Actually, costs associated with ocean-based plastic waste leads to losses of 13 USD billion annually because of the environmental damage to marine ecosystems, including revenue losses to fisheries and marine tourism industries in addition to the cost of cleaning up litter on beaches [14]. On land, improperly discarded plastics could block drains and waterways, causing floods during rains, exacerbating natural disasters, and creating habitats for mosquitoes and pests, which increases the contagion with vector-borne diseases [6]. Furthermore, mismanaged waste located near inland waterways serves as an input of plastics into rivers and oceans [15]. Therefore, there is a necessity to improve waste management infrastructure and reduce plastic generation, especially in coastal countries [16].

In agreement to the Charter of the United Nations (1945) [17], states are responsible for the environmental damage caused by activities within their jurisdiction that could impact areas beyond their national borders [18,19]. The 2030 Agenda of the United Nations considers that policy coherence is required for a sustainable management of marine and coastal ecosystems (Sustainable Development Goals 15) [20]. Consequently, in order to guarantee the preservation and enhancement of the human environment, it is necessary to cooperate through multi-stakeholder partnerships (Sustainable Development Goals DG 18) [21]. Different platforms have been established worldwide to tackle the negative consequences of the inadequate patterns of production and consumption of SUP.

This paper analyzes the case of SUP governance in the States of the Pacific Alliance (PA), as a regional platform. The main objective is to assess the instrumental level of articulation between international environmental law principles and the regulatory responses, at the national and subnational levels, of Mexico, Colombia, Chile, Peru, and Ecuador (Observer State of the Pacific Alliance). For this purpose, a framework analysis of the official legal documents from those countries is developed. Hereafter, the multilevel governance of plastics is described, with a focus on law as a driving factor. Then, the illustrative case study of the PA is analyzed to determine how this could become a regional partnership to tackle problems associated with SUP.

## 2. Analytical Framework: Multilevel Plastics Governance

Plastic is part of global value chains with severe consequences in developing countries that still have deficiencies in waste management infrastructure, normative and institutional capacity [22,23]. The achievement of sustainable development requires a global partnership (SDG 17) [20] to ensure policy and institutional coherence. In this sense, law is an essential element to guarantee fair and effective horizontal and vertical governance [24]. It is necessary to strengthen cooperation within multilevel governance (In Latin America, the terms governance and governability have had diverse interpretations, which caused a semantic and conceptual debate [25]), understood in this case as a complex process of decision making to solve the collective problem of the inadequate use and disposal of SUP [26,27]. The following sections present a description of the role of law in global, regional and national plastic governance.

### 2.1. Global Governance of Plastics for Ocean Conservation

This global level comprehends international agreements and platforms established to coordinate multi-stakeholders' relations that exceed national borders. At this level, global plastics governance is linked with marine plastic pollution originated from land and sea sources, due to the achievement of Goal 14 [20] for life below water of the 2030 United Nations Agenda for Sustainable Development. In fact, under the United Nations cooperation, two voluntary global multi-stakeholder platforms have been established. The first was the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (1995) [28] and the second was the Global Partnership on Marine Litter (2012) [29].

In this context, during the Fifth International Marine Debris Conference (2011), the Honolulu Strategy (2030) [30] was implemented as a framework for the prevention and management of marine debris, considering as one of its strategies the promotion of policies and regulations to reduce the most common items, such as plastics. Moreover, the United Nations Environment Assembly of the UNEP (United Nations Environmental Program) has developed three resolutions on marine litter and microplastics (2019) [31]. The objectives of those were to work on long-term elimination of litter discharge and microplastics to the oceans, support research and assessment on governance strategies, and facilitate the implementation of regional and national multi-stakeholders' action plans [32–34].

Furthermore, the International Convention for the Prevention of Pollution from Ships (MARPOL), added the Annex V for the prevention of pollution by garbage from ships, implementing a complete ban on the disposal of plastic waste in the sea (1988) [35]. Afterwards, the International Maritime Organization (IMO) developed an Action Plan to tackle marine plastic waste from ships (2018) [36]. In 2019, the IMO and the Food and Agriculture Organization of the United Nations (FAO) consolidated a global project for reducing marine litter from fishing activities, especially fishing gear and plastics, called the GloLitter Partnerships Project [37].

Other international agreements on marine issues are the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention) [38] and the United Nations Convention on the Law of the Sea (UNCLOS) [39]. The London Convention (1972) and its Protocol (1996) [38] prohibits plastic dumping at sea. Meanwhile, the UNCLOS (1982) [39] establishes principles and general rules, considering marine pollution and the necessity of the States to develop specific, not only national but regional standards.

Moreover, in 2019 under the decision BC-14/12, amendments were approved to the annexes of the Basel Convention [40] to control and increase the transparency of the transboundary movements of plastic waste. Plastics can also carry Persistent Organic Pollutants (POPs), causing negative effects when they are leached into the ocean or burned in an uncontrolled manner [41]; therefore, the Stockholm Convention is an important platform to limit the use of POPs and improve the environmentally sound management of plastics. In this context, a Plastic Waste Partnership [42] has been established under the Basel Convention to avoid plastic waste discharge into the environment, with the participation of different stakeholders, considering the Stockholm Convention as well.

The global governance of plastics is also visible in a variety of action plans for ocean conservancy led by UNEP. In this sense, Colombia, Ecuador, Chile, and Perú are part of the Permanent Commission for the South Pacific (CPPS), a regional maritime organization founded in 1952 that acts as the coordinator of the Plan of Action for the Protection of the Marine Environment and Coastal Areas in the Southeast Pacific, which includes Panama [43]. In this context, in 1983 the CPPS adopted the Protocol for the Protection of the Southeast Pacific from Land-based Sources of Pollution to tackle solid waste discharge from land-based and sea-based sources [44]. On the other hand, Mexico is part of the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region, known as the Cartagena Convention (1983) [45] and the Regional Action Plan on Marine Litter Management (RAPMaLi) for the Wider Caribbean Region [46].

At present, there is no binding international convention regulating environmental problems caused by plastic pollution [47–49]. In 2016, UNEP disclosed an analysis of governance strategies of marine litter, which recommends the adoption of urgent and voluntary actions to improve stakeholders' coordination and industry involvement, while a new international agreement is developed [50]. The achievement of the Sustainable Development Goals in the international arena brings the opportunity of a common language for horizontal coordination; in this context, the negative consequences of the inadequate use and disposal of SUP are visible and demand an urgent articulated response in accordance with local realities. Therefore, the international agreement should contemplate clear and measurable targets to reduce plastic pollution, and the development of standardized databases to enforce monitoring and policy evaluation [51].

## 2.2. Regional Plastics Governance in the European Union for a Circular Economy

The EU is a great example of multilevel regional coordination that has had an unprecedented global impact through its legal standards and market mechanisms [52]. In fact, the European Union pursues the mainstreaming of Circular Economy objectives through its different trade agreements [53]. Aligned with the Action Plan for the Circular Economy [53], in 2018 the Regional Strategy for Plastic in a Circular Economy was launched. In brief, the measures proposed to implement the strategy were: (a) improve the economics and quality of plastic recycling; (b) curb plastic waste and littering (reduce SUP, monitor and curb marine litter, and microplastics); (c) invest and innovate on circular solutions [54].

Later on, in 2019, the EU developed a Directive on the reduction of the impact of certain plastic products on the environment [55]. The main focus of this policy was SUP products most often found on European beaches, as well as abandoned fishing gear and oxo-degradable plastics. It presented the following policies: (a) ban on selected SUP for which alternatives exist on the market; (b) measures to reduce consumption and specific labelling of certain products; (c) application of the extended producer responsibility (tobacco filters and fishing gear); and, (d) collection targets for plastic bottles, as well as, the obligation to incorporate recycled plastic in bottles. The last update of these policies came in 2020 with the new Circular Economy Action Plan for a cleaner and more competitive Europe, which considers plastics as one of its main areas of intervention, focused mainly on the regulation of recycled content, waste reduction and labelling of products [53].

## 2.3. National and Subnational Plastics Governance

The formal adoption of institutional rules within national borders also comprehends complex interaction processes. In fact, the negative externalities of SUP are addressed mainly by national governments, considering specific products and mostly their EoL [56–58]. There is an erratic approval of local policies that are uneven with inconsistent standards that could lead to systemic illegalities [48,49]. For example, while high-income countries have been the primary exporters of plastic waste, China and Hong Kong had imported 72.4% of all plastic waste traded from 1988 to 2016; a situation that drastically changed with the adoption of the Chinese import ban on non-industrial plastic waste in 2017 [59].

From a national perspective, the UNEP [8] delivered in 2018 a report reviewing plastic bags, single-use plastics and microplastics national laws in 192 countries. The results showed that in the case of plastic bags, 66% of the countries had adopted some form of legislation, mostly related to a ban on free retail distribution; fourteen of those countries were from Latin America and the Caribbean (LAC). On the other hand, in the case of single-use plastics, only around 14% of the countries had enacted through law some type of ban; five countries of LAC are part of this group. The situation is even worse in the case of microbeads, in which only 4% of the countries had established legally binding bans through national laws, and none of them were from LAC.

In January 2019, fourteen countries of the Caribbean Region banned styrofoam, plastic bags, or both. Those regulations were established to reduce the use of common litter items, improve aesthetics and reduce the costs of cleaning up [60]. The main motivation could be explained in terms of their reliance and connection to marine ecosystems, and tourism that could be impacted by plastic pollution [8].

Other systematic literature reviews based on peer reviewed and grey literature have been conducted to analyze market-based strategies and policies for banning or adding taxes, levies or fees on SUP around the world (plastic bags and microbeads) [13,61,62]. Xanthos and Walker (2017) [61] analyzed plastic bags and microbeads policies, concluding that in South America interventions are severely lacking, and research is missing to establish the positive short and long term impacts of the different measures. In 2018, Schnurr et al. [13] made an update of the previous study that showed an increase in the number of strategies implemented in national and subnational governments in South America, especially for plastic bags; in spite of that, limited legislative bans on the rest of SUP were identified in the region.

A review, done by researchers of the Nicholas Institute for Environmental Policy Solutions of Duke University, presented the common factors that could have an impact on plastic pollution policy

effectiveness. The following were identified: availability of inexpensive reusable alternatives, public awareness and acceptance, as well as the levels of enforcement of compliance. In the case of economic instruments, the amount of the levy or tax is relevant, considering that their objective is to change the behavior of consumers instead of representing real pollution costs [51].

#### 2.4. Framework for Assessing and Improving Law for Sustainability

As shown in the previous sections, law and public policies could be a driving factor to achieve sustainable development and to tackle the negative consequences of improper use and disposal of SUP. In international environmental law, sustainable development comprehends: intergenerational equity (future generations), sustainable use (resource efficiency), intra-generational equity across different parts of the world, and integration of environmental issues into economic and development planning [63]. In order to evaluate the strength of policy implementations, this study utilizes the Framework for Assessing and Improving Law for Sustainability of the International Union for Conservation of Nature (IUCN) [24]. The mentioned tool aims to evaluate the effectiveness of law in natural resources governance from the operationalization of legal principles. The Framework from the IUCN assesses the implementation of those principles in the following levels: (a) formal legal arrangements; (b) governmental administrative actions; (c) patterns of behaviour; (d) social and environmental outcomes. This study focuses on the first level of formal legal arrangements.

Following the Framework, international environmental law principles, relevant for SUP governance, and their legal sources were identified according to the Table 1:

**Table 1.** Normative source of legal principles.

| International Environmental Law Principles | Normative Source  |
|--|---|
| 1. Principle of cooperation                | <ul style="list-style-type: none"> <li>— Stockholm Declaration (Principle 24);</li> <li>— Rio Declaration (Principle 27);</li> <li>— UNEP Resolutions.</li> </ul>   |
| 2. Principle of preventive action          | <ul style="list-style-type: none"> <li>— Stockholm Declaration (Principle 11);</li> <li>— Rio Declaration (Principle 2/24);</li> <li>— UNCLOS;</li> <li>— London Convention;</li> <li>— MARPOL;</li> <li>— Cartagena Convention (1983);</li> <li>— Protocol for the Protection of the Southeast Pacific from Land-based Sources of Pollution (1983).</li> </ul> |
| 3. Precautionary principle                 | <ul style="list-style-type: none"> <li>— Rio Declaration (Principle 15);</li> <li>— Stockholm Convention.</li> </ul>  |
| 4. Polluter pays principle                 | <ul style="list-style-type: none"> <li>— Rio Declaration (Principle 16)</li> </ul>  |

Source: self-elaboration. The sources listed are not exhaustive but extensive for SUP.

According to the normative sources listed above, the preventive action principle is orientated to implement the best possible efforts to reduce, limit and control activities that could cause damage [18]. Therefore, the adoption of appropriate rules and measures with the corresponding administrative compliance policies is required [63]. On the other hand, the precautionary principle is applied when there is scientific uncertainty [18,19]. In 2000, the European Commission adopted a communication on the precautionary principle, stating that it must be proportional, not discriminatory in its application, consistent with previous measures, based on technical (if possible also economic) analysis, and subject of permanent evaluation considering scientific advances [64]. The polluter pays principle comprehends the fact that the costs of pollution must be internalized by the person responsible for causing the pollution [18]. For this principle, difficulties could appear when calculating the economic value of pollution and in terms of the producer's traceability [63]. The duty to cooperate in good faith is essential when transboundary resources are considered because there is a necessity to determine suitable common transboundary environmental standards [18,19].

In this case, those legal principles were considered to evaluate only the instrumental level of formal arrangements. For this purpose, an operationalization process of the mentioned legal principles required the application of a circular economy and life cycle approach. The circular economy is considered a tool to achieve sustainable development, although its concept does not always comprehend an integral view of environmental, economic and social equity [65]. Therefore, a life cycle perspective is required to assess the different consequences of inadequate use and disposal of single use plastics [66,67]. The circular economy perspective on plastics governance pursues the following objectives: (a) eliminate those considered unnecessary; (b) innovate to guarantee that indispensable plastics are reusable, recyclable and compostable; and, (c) circulate all plastics to keep them in the economy [3,58,66,68]. In general terms, specific policies to address plastic pollution could be classified in three different types: regulatory (affirmative or prohibited measures), economic (incentives or taxes), and information instruments (research, education, labelling) [51]. Consequently, the next specific policies were identified along the life cycle of SUP (Figure 1):

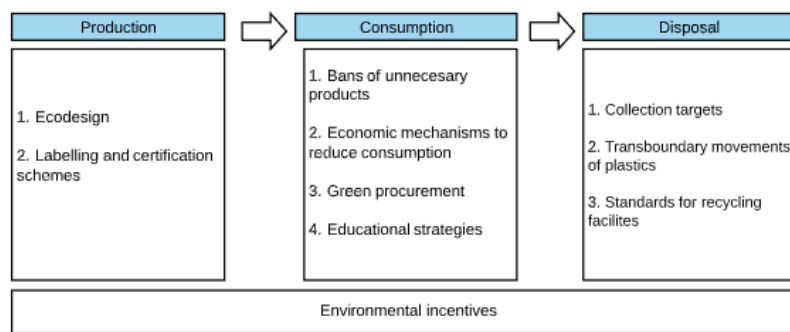


Figure 1. Life cycle approach of environmental policies in the case of SUP. Source: self-elaboration.

The preventive action, precautionary and polluter pays principles are visible on Extended Producer Responsibility (EPR) schemes that include: (a) incentives to achieve environmentally-sensitive design of products; (b) the development of labelling and certification schemes, as information instruments to raise public awareness; and, (c) collection targets or other deposit-refund policies at the post-consumer stage [69,70]. Moreover, bans on unnecessary products as a regulatory instrument, and economic mechanisms to reduce consumption, such as taxes, represent the most common policies approved by national governments to tackle single use plastic problems [8]. Circular public procurement policies were considered due to the representation of the public sector in national economies [71]. On the other hand, the transboundary movements of plastics and standards for recycling facilities must be applied considering the principle of cooperation. In conclusion, the framework of analysis corresponds to the graphic (Figure 2):

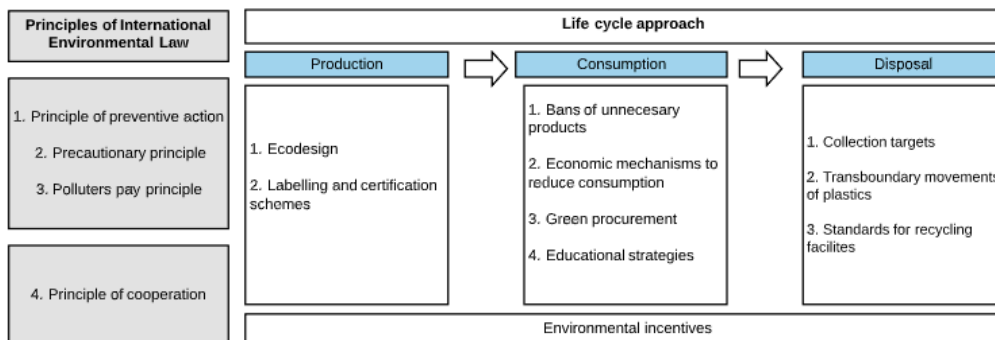


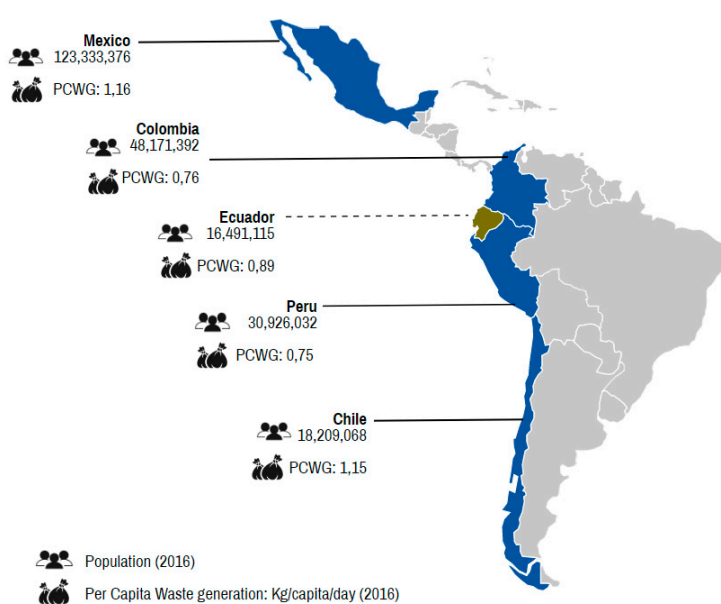
Figure 2. Framework of analysis. Source: self-elaboration.

### 3. Illustrative Case Study: The Regulation of Single Use Plastics in the Pacific Alliance

The Pacific Alliance (PA) is a regional organism founded in 2011 to pursue the economic growth and social development of its constituents, Mexico, Peru, Chile and Colombia. Ecuador is an observer state that applied in 2019 for full membership [72]. Many integration projects in Latin America have emerged during the last decades, most of them making use of the geographical proximity to create intraregional markets; however, many of them, such as ALADI, SELA, the Andean Community, MERCOSUR and UNASUR failed in their attempt to create forums of convergence [73]. The PA was established on the basis of a shared political and economic vision to enhance commercial integration and the free movement of goods, services, capital and persons, with a special focus on the Asia–Pacific region. In 2018, this regional block was the eighth largest economy worldwide, which means 40% of the GDP of LAC [74].

In 2016, the Environment and Green Growth Technical Group of the Pacific Alliance [75] was formed to strengthen cooperation on sustainable development by the joint work of the different environmental national authorities. In this aspect, the presidents of the States have adopted two common declarations, one on climate change (2014) [76], and one on single use plastics (2019) [77]; both are soft law instruments. The Presidential Declaration on Sustainable Plastic Management showed the shared concern of the States about the increasing generation and accumulation of microplastics and plastic waste in the environment and its negative consequences on health, biodiversity, and the economy [77].

In Latin America and the Caribbean, 68.5% of waste is disposed in landfills, followed by open dumps in a 26.8%, while less than 5% of waste is destined to material recovery, including recycling and composting [4]. Mexico, Colombia, Peru, Chile, and Ecuador still face serious sustainable waste management challenges, reflected in high percentages of dumping practices, limited sorting, and low recycling rates [78–83]. In Mexico, only 12.1% of municipalities implemented waste sorting systems in 2019 [78]. The recycling rate of Colombia for 2016 was 8.7%, with plastic waste comprising 6.1% of the total amount of material that was recuperated in 2017 [79]. In Perú, only 2% of inorganic waste was valued [80]. The recycling rate in Chile for 2017 was 11.8% [81]. In Ecuador, for 2017 10.6% of waste generated was plastic and 36.5% of the municipalities maintained programs for source separation [82]; while in 2014, 24% of the material that could be potentially valued was actually recycled [83]. The following graphic shows per capita waste generation for the countries of the PA (2016); the regional (LAC) mean for the same year was 0.99 kg/capita/day [4,84] (Figure 3):



**Figure 3.** Per capita waste generation (PCWG) in the Pacific Alliance. Source: Self-elaboration from Kaza et. al. (2016) [4]; World Bank (2016) [85].

The negative externalities of SUP in marine ecosystems and coastal areas are tangible in the PA countries. Results from the International Coastal Clean-up Day (2005), organized by the Ocean Conservancy in Colombia, Ecuador, Chile, and Peru, showed that beverage plastic bottles, bottle caps and other containers, as well as cigarette filters, were the most commonly found items [86]. On the other hand, results from the same campaign in 13 countries of the Wider Caribbean Region showed that the top items found were: beverage bottles (plastic), bags (plastic and paper), caps and lids, utensils, cups, plates and beverage bottles (glass) [47].

The PA shows the possibility of policy articulation beyond national borders to face the global problem of SUP in the Latin American arena. The Presidential Declaration on Sustainable Plastic Management of the PA suggests the approval of the following coordinated national policies: (a) plastic bag regulations; (b) prohibition of plastic cutlery and straws in natural and cultural protected areas (special emphasis on marine ecosystems); (c) promote research and innovation in plastic industry; (d) characterization of plastics and the consumers right to have information; (e) encourage substitutes for SUP, and educational campaigns [77].

It is necessary to mention that other regional organisms have developed similar declarations. Actually, the G7, in the 2015 Summit in Germany, launched an action plan to tackle marine litter [87], and, later on, during the 2018 Summit, Canada, France, Germany, Italy and the United Kingdom agreed to sign the “Ocean Plastics Charter” [88]. On the other hand, the G20 adopted, during the 2017 Summit in Germany, a Framework for Actions on Marine Plastic Litter that included the “G20 Operational Framework” and the voluntary “Global Network of the Committed” (GNC) [89].

Eventually, the countries of the PA also became part of the previously mentioned platforms for the global governance of plastics and ocean conservancy. The Table 2 shows that the countries of the PA have ratified a series of international agreements in terms of the prohibition of plastic waste discharge from ships, regulation on the transboundary movements of plastic waste, the recognition of the risk of the presence of POPs on plastics, and other regional marine platforms to tackle marine pollution from coastal sources.

**Table 2.** Status of ratification of international agreements of plastic governance.

|          | MARPOL<br>Annex V<br>(1988) | London<br>Convention<br>Protocol<br>(1996) | UNCLOS<br>(1982) | Basel<br>Convention<br>(2019) | Stockholm<br>Convention<br>(2001) | CPPS<br>Protocol<br>(1983) | Cartagena<br>Convention<br>(1983) |
|----------|-----------------------------|--|------------------|-------------------------------|-----------------------------------|----------------------------|-----------------------------------|
| Mexico   | X                           | X  | X                | X                             | X                                 |                            | X                                 |
| Colombia | X                           |  |                  | X                             | X                                 | X                          |                                   |
| Peru     | X                           | X  |                  | X                             | X                                 | X                          |                                   |
| Chile    | X                           | X  | X                | X                             | X                                 | X                          |                                   |
| Ecuador  | X                           |  | X                | X                             | X                                 | X                          |                                   |

Source: self-elaboration. The “X” mark means that the international agreement has been ratified by the State.

#### 4. Materials and Methods

This research is based on an illustrative case study involving the PA and its members. The framework analysis was applied, which considered environmental law principles and specific public policies to tackle the negative externalities of SUP. Data collection consisted of the recovery of official legal documents of the countries considered in the illustrative case of the PA. For this purpose, legislation that regulates single use plastics at a national and subnational level was considered. Any regulation in the process of adoption was not considered, and neither were non legally-binding instruments of public policy. The legal documents were tracked through media reports and literature, as well as using an online international legal database, called ECOLEX (IUCN, UNEP, FAO), and, the following official governmental websites: LEGISMEX (Mexico), SUIN-JURISCOL and Diario Oficial (Colombia), Diario Oficial El Peruano (Perú), Biblioteca del Congreso Nacional de Chile (Chile), and Registro Oficial (Ecuador).



Chile and Peru have developed national especial legislation on SUP. Therefore, in order to avoid contradictory results, in the case of Chile, only subnational legislation for plastic bags adopted after the 20th of July of 2018 was considered. On the other hand, in Peru only subnational regulation enacted after the 19th of December of 2018 was taken into account. The Table 3 shows the documents selected for the analysis:

**Table 3.** National and subnational legislation selected for the framework analysis.

|          | National | Subnational | Total |
|----------|----------|-------------|-------|
| Mexico   | 1        | 35          | 36    |
| Colombia | 4        | 7           | 11    |
| Peru     | 5        | 5           | 10    |
| Chile    | 3        | 3           | 6     |
| Ecuador  | 5        | 11          | 16    |
| Total    | 18       | 61          | 79    |

Source: self-elaboration from data collection.

Data analysis was developed through the implementation of the Framework for Assessing and Improving Law for Sustainability according to the previous section [24]. The software Atlas.ti was used to codify the legal documents. For this purpose, a codebook was developed according to the categories of analysis from the international environmental law principles and the public policies approved.

Moreover, in order to analyze the regional response of the PA, three additional documents were considered. The Presidential Declaration on Sustainable Plastic Management (2019) of the PA [77], as well as the following documents from the European Union: (a) Regional Strategy for Plastics in a Circular Economy (2018) [54]; (b) Directive on the reduction of the impact of certain plastic products on the environment (2019) [55].

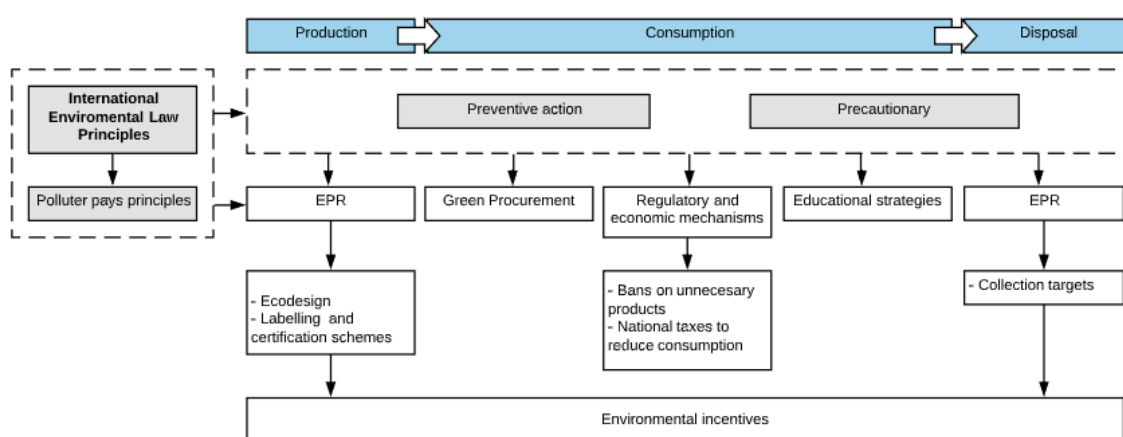
## 5. Results

The results from the analysis of the selected national and subnational official legal documents of the PA countries are presented into two different sections. The first one presents the results of the implementation of the prevention, precautionary and polluter pays principles from a circular economy and life cycle approach; therefore, the focus of this section is policy coherence between specific national and subnational legal environmental strategies enacted across each of the PA countries. The second section verifies the cooperation principle and the potential of the PA as a regional platform to establish minimum standards in terms of plastics governance articulation.

### 5.1. Preventive Action-Precautionary Principle and Polluter Pays Principles

Almost every regulation analyzed in the PA mentions an initial justification of environmental and health risks associated with unsustainable production and consumption patterns of SUP. In this context, specific strategies according to the framework proposed in Section 2.4 were identified in each legal document to evaluate, at a national and subnational level, the operationalization of the preventive, precautionary and polluter pays principles. The Figure 4 shows the relations between those International Environmental Law Principles and legal strategies enacted at a national and subnational level.

Mexico as a federal state has a national law for the prevention and management of waste (2003) [90], reformed in 2014, which recognizes the shared responsibility of the producer in the case of plastic containers. At a local level, the different subnational governments have approved reforms to reduce the consumption of SUP and prohibit the delivery of plastic bags. Those subnational laws recognize the responsibility of the producer in terms of ecodesign, labelling schemes, and collection targets. An interesting case is the Federal District of Mexico City that established a ban on products that contain microplastics, a material that has not received attention in the region (2019) [91].



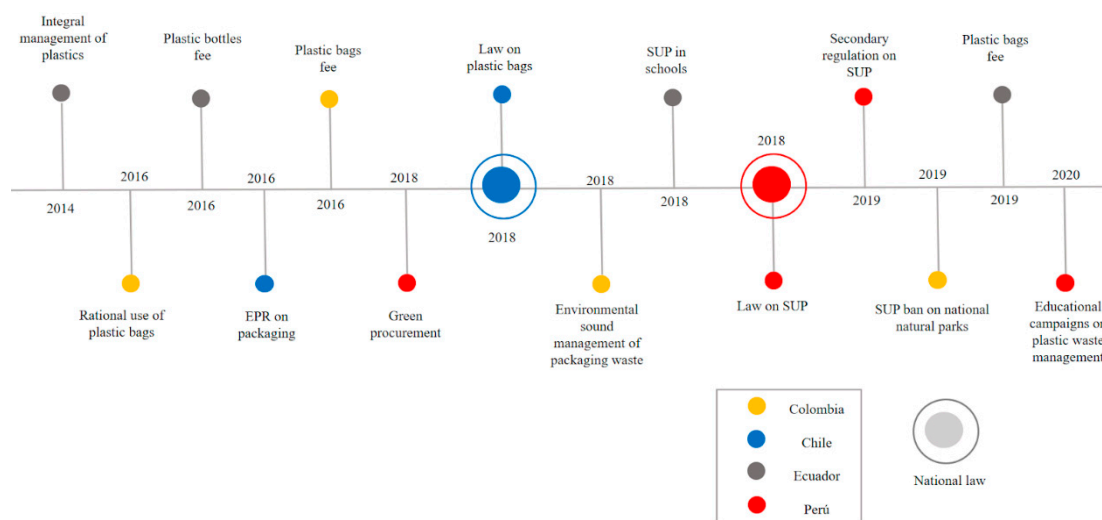
**Figure 4.** Operationalization of legal environmental principles for SUP. Source: self-elaboration.

Colombia does not have a single normative mechanism to regulate SUP. However, the State has established a national ban on SUP at National Natural Parks (2019) [92], a national fee on plastic bags (2016) [93], becoming the first country to introduce this type of economic instrument in the PA, and two different agreements of the Ministry of Environment that regulate the environmental management of packaging (2018) [94], including plastics, and an older one for the rational use of plastic bags (2016) [95]; in both cases, EPR strategies are considered in terms of ecodesign, labelling schemes, and recovering targets. Governmental statistics show that 71% of Colombian households have reduced the consumption of plastic bags since the national fee was approved; furthermore, that fiscal strategy permitted the State to raise \$10.460 million Colombian pesos during the second quarter of 2017 [96]. At the subnational level, two departments, four municipalities and one district, were identified to approve normative measures to reduce the use and consumption of SUP and plastic bags, especially linked with effects on ecotourism [97–103]. In the case of the coastal District of Santa Marta, the local regulation (2018) [103] showed data on the prevalence of plastic waste found in some beaches that belong to the Department of Magdalena, from a study done by the INVEMAR, a marine research institute linked with the Ministry of Environment.

Peru adopted a national legislation on single use plastics (2018) [104] with its corresponding secondary regulatory development (2019) [105]. That normative measure also establishes a national fee on plastic bags. Declarations from the Ministry of Environment stated that there was a reduction of 30% of plastic bags consumption during 2019 [106]. The latest legal enactment was the national educational campaign on plastic waste management lead by the Ministry of Environment (2020) [107]. Furthermore, Peru also has interesting development in terms of green procurement and restrictions to the acquisition of SUP in the public sector (2018) [108]. At the subnational level, legislation was found in regional and municipal governments (5) [109–113] in terms of SUP and in harmony with national laws.

Chile has a national legislation that prohibits the delivery of single use plastic bags in the national territory (2018) [114]. This regulation came after 63 Chilean municipalities established voluntary schemes to prohibit plastic bags, the first being adopted in 2013 [115]. National statistics of public opinion about environmental measures show that 95% of citizens agree with the prohibition of plastic bags [116]; moreover, declarations from the Ministry of Environment communicate that since the normative was implemented, the delivery of 5000 million plastic bags has been avoided [117]. Chile also has a national legislation on EPR (2016) [118] that contemplates packaging as a priority product, considering a variety of strategies to guarantee the polluter pays principle. Moreover, Chile reformed (2018) [119] its Penal Code to punish people that pollute national parks or watersheds. At the subnational level, there are new normative initiatives adopted to regulate SUP in general; this is the case of the municipalities of Providencia and Zapallar (2019) [120,121].

Ecuador does not have one national legislation on SUP; however, the State has established a national fee on plastic bags (2019) [122], a national agreement to decrease the consumption of SUP in public and private schools (2018) [123], a deposit–refund system for plastic bottles made of polyethylene terephthalate (2016) [124], and a national regulation developed by the Ministry of Environment that tends to normalize the life cycle of plastics considering the application of EPR, in terms of ecodesign, labelling schemes, collection targets, and environmental incentives (2014) [125]. At a subnational level, Ecuador has a variety of local normative measures; for now, three provinces and eight municipalities have adopted restrictions on SUP, with special emphasis on plastic bags and straws [126–133]. The case of the Galapagos Islands is of special interest, considering that although 97% of its territory is inhabited by humans, plastic waste is visible [134] because it comes from nearby fishing regions and South and Central American coastlines, in particular, northern Peru and southern Ecuador [135]. Therefore, in 2015 [136] the subnational government established a local normative and an action plan to reduce the consumption of SUP. In fact, statistics from the Ecuadorian government show that the consumption of plastic bags in Galapagos has plummeted down since 2015 [137]; in 2014, 75.71% of households in Galapagos used to consume plastic bags, but since 2015 the percentage of households is less than the 30%, being 7.20% in 2018 [138,139] Figure 5 shows a timeline of the normative response of the PA countries that verifies the diversity of national approaches for SUP regulation in the PA countries. Chile and Peru (2018) [104,114]. have been the first countries to normalize the prohibition of the delivery of plastic bags and SUP in their national territories. However, the most common strategy is the establishment of national levies on plastic bags to influence consumer behaviour, this being the case in Colombia, Peru, and Ecuador. Initiatives on green procurement are still missing in the region. Normative measures usually regulate only the products destined for local consumption; therefore, the PA could be the opportunity to state recyclability standards from a regional perspective, requirements on eco-design, access to information about chemical composition SUP, and transboundary movements of plastic waste.



**Figure 5.** Timeline of the national regulation in the PA. Source: self-elaboration.

## 5.2. Cooperation Principle

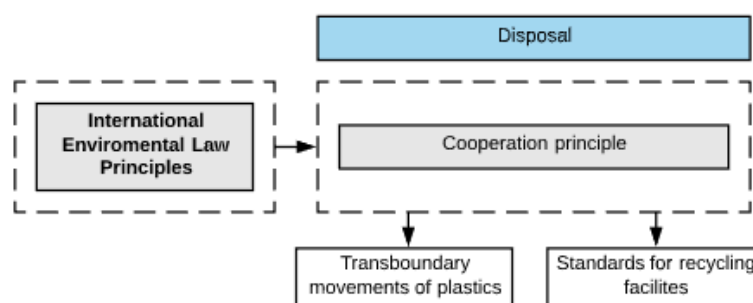
International environmental law is a complex system, in which general principles, as a theoretical basis, provide parameters for environmental protection and orientate the development of law. In this sense, the cooperation principle contemplates certain procedural obligations such as environmental assessment, exchange of information to improve environmentally sound management and prevent illegal traffic, notification, consultation, and negotiation on the basis of good faith [140].

Exceptional international cooperation is required to address environmental issues for the prevention or mitigation of marine pollution.

For instance, cooperation in terms of the United Nations Convention on the Law of the Sea (UNCLOS) comprehends the right to information, technology transfer, and the adoption of rules for the prevention, reduction and control of marine pollution [141]. On the other hand, the Basel Convention tends to prevent the harm of the end of life of plastic waste [142]. This International Agreement, ratified by all the countries of the PA, contemplates a variety of principles such as the self-sufficiency and proximity to ensure waste generated is disposed within the territory, recognizing that some wastes could be economically soundly managed abroad; the source reduction principle that tends to decrease waste generated in terms of quantity and hazardousness; and, the principle of prior informed consent, an expression of state sovereignty and an evidence of the shared responsibility of exporting and importing states [140,143].

In this context, Figure 6 shows the relation between the cooperation principle and the specific strategies, mostly present in the last stage of the life cycle of SUP, on transboundary movements of plastics and standards for recycling facilities. Those policies are part of binding international agreements for ocean conservancy orientated to regulate the discharge of plastic waste from ships or other land-based sources. In connection, recycling facilities standards must be evaluated to avoid systemic illegalities, considering the difficulties associated with waste management systems in developing countries.

The Declaration of the Ministries of Environment from the countries of the Pacific Alliance (2016) and the conformation of the Environment and Green Growth Technical Group shows the willingness of this regional platform to achieve international environmental cooperation. However, national and subnational initiatives face challenges due to the fact that plastic products are part of global value chains through international trade [69]. Moreover, the variety of normative responses that are not coordinated in a regional perspective causes a diversity of standards that could lead to illegalities because SUP end up being prohibited only within local borders, when this problem is transboundary and requires policy coordination.



**Figure 6.** Operationalization of cooperation principle for SUP. Source: self-elaboration.

As seen before, SUP require multi-level governance that involves interactions between various administrative levels, considering the transboundary nature of the problem and the dispersed capacity for solving it. Therefore, connectivity brings out the discussion of how to implement effective, legitimate and resilient governance arrangements that align regional, national, and local planning for short-term interventions and long-term adaptive solutions [144]. Institutionalized shared policies are important mechanisms for encouraging collaboration and connectivity in terms of knowledge and resource allocation and to avoid the dependence on personal relationships or leaders. Nevertheless, collaboration is desirable, and unilateral legislative interventions could be alternative strategies capable of resilient policy development [145]. The PA has established a regional declaration for sustainable plastic management (2019) [77], as a soft law instrument to guide national and subnational regulation. However, those policies recommended, in comparison with the European Union Regional Strategy

for Plastic in a Circular Economy (2018) [54] and the Directive on the reduction of SUP (2019) [55], binding international instruments, could be still improved from a circular economy and life cycle approach. In this sense, the Table 4 contrasts the policies suggested by the Pacific Alliance and the regional normative response of the European Union to the problems associated with SUP. This shows that it is important to regulate and restrict microplastics added intentionally to products, as well as oxo-degradable plastics. In addition, SUP should be banned considering the existence of substitutes in the market. In the case of ecodesign policies, attention should be put on recyclability of plastics, and clear labelling schemes that could raise public awareness of the consequences of inappropriate waste disposal. Moreover, it could be interesting to establish a regional research agenda, voluntary information systems of the situation in each country, as well as funding strategies. Eventually, it will be necessary to improve separate collection and recycling facilities in the region considering the low actual recycling rates.

**Table 4.** Comparative analysis of the PA recommendation and the EU binding policies for SUP.

| Policies Approved                  | PA (2019) [77]   | EU (2018; 2019) [54,55]  |
|------------------------------------|--|--|
| Bans on unnecessary products       | Plastic bags regulations to reduce consumption.<br>Prohibition of SUP in natural and cultural protected areas (special emphasis on watersheds and marine ecosystems).<br>Encourage consumption of substitutes for SUP. | Curb plastic waste and littering.<br>Restrict the use of intentionally added microplastics.<br>Ban on selected SUP for which alternatives exist on the market.<br>Ban on products made from oxo-degradable plastic.  |
| Ecodesign Environmental incentives | Promote research and innovation in the plastic industry to develop substitutes for SUP.  | Improve the design and support innovation to make plastics and plastic products easier to recycle.<br>Regional research agenda and funding.  |
| Labelling schemes                  | Characterization of plastics and the consumers right to have information.  | Specific marking and labelling of certain products to inform the consumer on the consequences of inappropriate waste disposal.   |
| Recycling standards and facilities |  | Improve separate collection of plastic waste.<br>Improve the EU's sorting and recycling capacity.<br>Create viable markets for recycled and renewable plastics.  |
| Educational strategies             | Educational campaigns.   | Raising public awareness as part of EPR schemes.   |
| Collection Targets                 |  | Collection targets for plastic bottles, as well as the obligation to incorporate recycled plastic in bottles.<br>EPR schemes for fishing gear and tobacco filters. It includes awareness raising, waste collection and cleaning up.<br>Deposit-refund schemes.<br>Separate collection targets. |
| Global Partnership                 | Promote cooperation in terms of technical, infrastructure and policy development.  | Establish global actions related with international organizations and agreements.<br>Information systems and annual country reports.<br>Evaluation of the Directive in 2027.   |

Source: self-elaboration.

## 6. Discussion

There are diverse subnational initiatives in the countries of the PAC to prohibit, in their territories, the delivery of plastic bags and SUP in general. It demonstrates the public recognition of the necessity to change the current patterns of production and consumption of plastics. Nevertheless, scientific studies in local areas are still needed to identify the real impacts of plastics along their life cycle and the best strategies to tackle the problems. Local responses are not articulated from a national perspective, except for the case of Chile (plastic bags) and Peru (SUP), a situation that can cause scattered standards by the logic that you can produce SUP only if you want to sell them in another territory when the environmental problem exceeds human borders. Consequently, national regulatory proposals should consider integral approaches of life cycle and circular economy to regulate a product that is part of international value chains, with differentiated consequences for developing countries, considering low recycling rates and limited waste collection and sorting systems. The international principles of preventive action, precautionary, and polluter pays require the approval and implementation of

tangible public policies in terms of EPR, educational mechanisms, green procurement, and regulatory and economic instruments to prohibit or discourage SUP production and consumption.

The Presidential Declaration on Sustainable Plastic Management of the PA (2019) [77] is a soft law instrument that shows the shared vision of the regional platform. Moreover, the existence of a Technical Group that conforms to environmental national authorities confirms the potential of the PA to articulate a common response to the transboundary problem of inadequate patterns of production and consumption of SUP. However, the Declaration does not impose binding obligations in terms of policy coherence within the economic block. Therefore, a regional agreement should be adopted to establish the minimum parameters in terms of plastics governance so national and subnational governments could adapt their normative response in appliance of the good faith principle in international law. This new agreement must contemplate a regional research agenda and a monitoring program to establish joint information systems. Consequently, strategic policies could be developed in the region within a clear time frame and with financial support. Moreover, from the comparison of the PA declaration on SUP and the EU normative response, there is still a necessity to work on microplastics, oxo-degradable plastics, recyclability of plastics, clear labelling schemes to raise public awareness, common requirements on eco-design, and access to information about the chemical composition of SUP.

All the countries of the PA are coastal, so ocean conservancy is part of their national agendas. Therefore, even though an international agreement could lead to a more articulated response, urgent actions must be developed. For this purpose, the Technical Group of the PA could establish non-binding recommendations to the States from the analysis of the reality of LAC, considering that there are marine regional platforms that could offer spaces for cooperation, even with the Asia–Pacific region. The case of the Archipelago of Galapagos (Pacific) in Ecuador and San Andrés (Caribbean Region) in Colombia, shows that plastics governance exceeds local regulation and requires a regional response.

## 7. Conclusions

The global governance of plastics, immersed in the 2030 UN Sustainable Agenda, is linked to the achievement of the SDG 12 of production and consumption patterns, and the SDG 14 that protects life below water. Mexico, Colombia, Ecuador, Peru, and Chile share that common vision in terms of SUP, as part of the Pacific Alliance. However, efforts are required to implement policy coherence at a national and subnational level to offer a regional response to a transboundary problem. For this purpose, the PA, as a regional platform, should contribute to determining those strategies from a circular economy and life cycle approach. Regulatory and economic mechanisms to prohibit the delivery of SUP, must be accompanied by EPR schemes, educational strategies, public green procurement, and knowledge-intensive verifiability mechanisms.

The main limitation of this paper was that SUP regulation is a recent phenomenon in the region and there is not a unique legal database that concentrates all environmental legislation; this is also lacking at a national level. Therefore, articulation is required to harmonize standards and develop governmental statistics to evaluate the effectiveness of those brand new laws in terms of social behavior and natural outcomes. For this purpose, further research, especially with other Latin American countries or international organizations like the OAS (Organization of American States), or MERCOSUR (Argentina, Brazil, Paraguay, Uruguay, Venezuela and Bolivia), could apply the framework of analysis presented in this article to verify the level implementation of the preventive, precautionary, polluter pays, and cooperation principles.

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