PROMAR Project Article

Toward a National Circular Economy Policy in Costa Rica

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Abbreviations

NCEP	National Circular Economy Policy
MINAE	Ministry of Environment and Energy
GESAMP	United Nations Joint Group of Experts on the Scientific Aspects of the Protection of the Marine Environment
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDB	Inter-American Development Bank
GDP	Gross Domestic Product
PPP	Purchasing Power Parity
R+D+i	Research, Development and Innovation
TFP	Total Factor Productivity
RP	Resource Productivity
INEC	National Institute of Statistics and Censuses
OECD	Organization for Economic Cooperation and Development
PTB	Physikalisch-Technische Bundesanstalt
WFD	Waste Flow Diagram

Support for the development of a National Circular Economy Policy: context and proposed strategic framework resulting from the research and analysis carried out within the PROMAR project, as part of its actions to prevent marine waste in Costa Rica

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The path towards a national circular economy policy

A National Circular Economy Policy (NCEP) is a strategic line defined to guide and articulate the efforts made by a country for economic strengthening, competitiveness and social well-being through the circularity of all the resources on which the productive sectors depend. In Costa Rica, the need to establish a NCEP is established in the National Development and Public Investment Plan 2023-2026, under the responsibility of the Ministry of Health, through the Directorate of Radiological Protection and Environmental Health and with the support of the Directorate of Environmental Quality Management of the Ministry of Environment and Energy (MINAE). This mandate is part of the national decarbonization goals that state the need to "*Implement actions within the framework of Law No. 8839 and its regulations aimed at strengthening the circular economy and integrated waste management*"

During the 2022-2024 period, the PROMAR project, executed in Costa Rica by CEGESTI, provided support to the country's government through research and analysis of information available both nationally and internationally in the areas associated with the planned regulation, which has made it possible to identify relevant inputs to be considered by the government, through the application of its own planning methodologies, for the development of the aforementioned NCEP, which are briefly shared in this article.

The promotion of a national directive in Costa Rica must follow a series of stages established by national regulations, which include, once a technically viable working document has been generated, a series of consultation processes with various stakeholders. The development of a basic working draft to activate the national process has been the focus of PROMAR's work in the country, and this has entailed an arduous process of research and analysis in order to determine the country's context in the issue to be regulated, its problem, the target population in which the policy aims to solve the problem, as well as the establishment of global objectives and goals as well as objectives, goals and indicators by axis of action derived from the meticulous analysis of the causalities and their effects from a results management approach.

Adding to the complexity has been the novelty of the circular economy issue, its focus on decoupling from the linear economic model, and the country's broad regulatory framework in areas such as sustainable production and consumption, decarbonization, waste management, bio economy and prevention of marine waste, among others; where, despite regulatory advances, a defined strategic line is required to guide and articulate the different efforts made by the country for economic strengthening, competitiveness and social welfare through the circularity of all resources. Due to its nature, among other impacts, this policy contributes to mitigating the generation of marine waste from terrestrial and marine sources.

Costa Rica's context: marine waste and circular economy

In its current context, Costa Rica presents three challenges that can only be faced with a profound change in its development model: climate change, social inequality and the economic slowdown. In this context, described in its 2023 National Circular Economy Strategy, the development of a NCEP has as its target population the Costa Rican society, the national productive sector, consumers, local governments and other various actors at the national level (NGOs, chambers and business associations, academia, professional associations, among others). The above is based on the various causalities that generate problems that a public policy as a line of action seeks to solve.

Within the field of circular economy, the endowment of value to resources and their permanence in the economic cycle; especially those that are residues of other resources, acquire special importance in the country in relation to the protection of its seas. According to the United Nations Joint Group of Experts on the Scientific Aspects of the Protection of the Marine Environment (GESAMP) and as detailed in the National Marine Litter Plan of Costa Rica 2021-2030; Between 60 and 80% of the world's marine pollution from solid waste comes from land-based sources and activities. In the country, a significant amount of waste remains uncollected or disposed of in the environment, being transported through rivers and streams or by wind and rain to the sea. According to the First Report on the Situation of the Waste NAMA (Deutsche Gesellschaft für Internationale Zusammenarbeit-GIZ, 2018) about 360,620 tons of waste per year are not collected (52% biodegradable waste, 13% paper and cardboard, as well as 13% plastics including polylaminated materials).

Added to the above are the waste from ships (fishing, merchant, tourist, others) and the absence of infrastructure that allows adequate management of this type of waste in a country where its terrestrial territory together with its Exclusive Economic Zone is 92% sea (530903.6km2 of sea, 51179km2 of land). According to the National Marine Litter Plan 2021-2030, the main factors limiting the increase in recovery and recycling are: low prices of materials that do not cover operating costs or investment, a limited national market, high direct costs, cost of transport from remote areas, lack of incentives for activity, limitations in municipal selective collection and poor separation of recyclable materials, especially plastic. However, the research carried out within the PROMAR project for the construction of the first NCEP working document suggests that the vision should be broadened towards actions to carry out the transition of the economic model from a linear to a circular one, thereby impacting the mitigation of waste leakage into the environment, including the marine environment.

Problems and their main effects from the perspective of the circular economy in the country

The development of the NCEP working document within the PROMAR project has sought to establish the foundations for a gradual transformation to adopt eco-efficient technologies and sustainable production and consumption models that significantly reduce current socio-environmental impacts, including the generation of waste and within these marine wastes, in line with the fulfillment of the country's national and international goals and commitments. In addition, this document proposes a starting point to initiate the national dialogue in accordance with the relevant regulations that lead to the approval of the rules in the country as a final result.

As proposed in the document, the formulation of a NCEP should focus on the country's basic problem. At the level of the research carried out to formulate the working draft, in the case of Costa Rica, it is identified as a central problem that its economic growth is correlated with the consumption of finite resources, generating negative impacts on economic, environmental and social matters, which include limitations on productivity and increasing generation of waste that is not seen as valuable resources and that often ends up escaping into ecosystems.

Some of the main effects of the problem, among many others detailed in the document that have been found during the research and analysis, include:

a) Low productivity compared to other members of the Organization for Economic Cooperation and Development (OECD).

I. Asymmetries persist between the sector associated with exports and investment attraction (free zone regime, with higher productivity) and production outside these zones.

i. According to the OECD Productivity Database (2018), gross domestic product per hour (GDP/h) in dollars at current purchasing power parity prices (PPP, 2018) is US$20/h, lower than the OECD average of US$56.1/h.

ii. Investment in private research, development and innovation (R+D+i) reaches only 0.13% of GDP according to the study "*Confronting the growth challenge: productivity and innovation in Costa Rica*" prepared by the Inter-American Development Bank (IDB) in 2020. There is little investment in R+D+i (0.34% GDP in 2022, according to data from the Ministry of Science and Technology.)

iii. Additionally, according to the Central Bank of Costa Rica, in its Material Flow Account for the country (August 2024) and the IDB in the aforementioned 2020 study:

- Total Factor Productivity (TFP) shows sustained but very limited economic growth (sustained annual growth of 1.2% GDP per capita, 1995-2019). A key factor of this indicator includes R+D+i, which should be up to five times higher.
- Resource productivity (RP), an indicator that provides a broad measure of the efficiency with which material resources are used within an economy, according to open data for this indicator by OECD is low for Costa Rica in 2019-2021 ($1.98/kg in relation to the OECD average of $2.45/kg), which also has a national consumption of materials of 9.72 tons per capita. which is higher than that of other countries in its region such as Mexico or Colombia (8.29 and 5.89 tons per capita respectively).

b) Increase in resource consumption in relation to nature's capacity to renew these resources.

Ecological debt as an indicator correlates the real use of natural resources per capita with the capacity of the territory to sustain that consumption. According to the 2023 State of the Nation Report, the ecological debt has deepened over time. Global Footprint Network shows that between 1961 and 2021 Costa Rica went from having an ecological reserve of 4.1 global hectares per person, to an ecological deficit of -0.9 global hectares per person. This index compares the available resources, considering the productive capacity of the territory and its rate of natural regeneration (biocapacity), on the one hand, and the real use that the population makes of them (ecological footprint), on the other.

c) Low rate of waste recovery and increase in per capita waste generation

i. As detailed in the National Policy for Integrated Waste Management 2023-2033, the ordinary waste collected by municipalities in 2021 was mainly destined for final disposal and only 9.7% of the waste was recovered and value added. In the case of electrical and electronic equipment waste, only 8.2% was recovered in 2021

ii. According to the Baseline Study "*Waste identified in monitoring sites in the Caribbean Sea of Costa Rica*" by PROMAR – CEGESTI of August 2022, plastic is the type of material with the highest presence in the sampling points of the Caribbean coast of the country with 54%, which is consistent with the small amount of plastic waste that is recovered for adding value, which according to the model created under the Waste Flow Diagram (WFD) tool for this PROMAR study, corresponds to 0.65% of all plastic waste that enters the system and ends up in the sea.

iii. According to the "*Regional monitoring of electronic waste for Latin America: results of the thirteen countries participating in the UNIDO-GEF 5554 project (2022)"* and the National Policy for Integrated Waste Management 2023-2033, the rate of ordinary waste generation in kilograms per inhabitant per day in Costa Rica went from 0.68 kg/inhabitant/day in 2016 to 0.86 kg/inhabitant/day in 2021. The generation of electrical and electronic equipment waste for 2022 was 13.2kg/inhabitant/year, which places Costa Rica as one of the Latin American countries that generates the most this type of waste.

Some of the key underlying factors

For the indicated context, several underlying factors are determined within the support for the construction of the working document for the generation of the CENP by PROMAR. Among them, the following:

a) Limitations to retain, recover or add value in order to maintain their useful life for as long as possible of the resources.

As mentioned before, there is low investment in R+D+i. In addition, as reported in the 2023 State of the Nation Report, there is a low value-added production chain and economic growth that in recent decades has not been sufficient to significantly reduce poverty or to ensure rapid convergence towards the economic and social levels of developed countries, with an average annual growth rate of 2.1% per capita in the last five years (IDB, 2020)

According to the report "*Quality Infrastructure for the Circular Economy in Latin America and the Caribbean"* by the Physikalisch-Technische Bundesanstalt (PTB, 2022), the transformation of products and materials in the main productive sectors requires actions such as creating opportunities for local value chains to circulate products and materials at their highest value; strengthening the manufacturing base through production and design approaches based on the circular economy; supporting the recycling system to create a market for higher-value secondary material; and creating decent jobs and business innovations in the region.

In addition to the above, informality in employment (39.2% for the second half of 2023 according to data from the National Institute of Statistics and Censuses-INEC), which in terms of waste management and/or its recovery is deepened as the waste recovery sector has difficulties in formalizing itself according to the country's labor regulations.

Finally, although there is a robust National Quality System that maintains a National Circular Economy Committee in operation and there is a National Bio Economy Strategy 2020-2030 at the central government level, it is still necessary to develop more national technical standards to strengthen the circular economy in the country.

b) Weaknesses in the efficient integrated management of waste.

The ordinary waste reported by the municipalities as collected in 2021 was mainly destined for final disposal and only 9.7% of the waste was recovered and value added. 12.4% had landfills as their final destination and 87.6% reached sanitary landfills;, according to data from the National Policy for Integrated Waste Management 2023-2033. Recycling, in percentage terms, decreased from 50% in 2020 to 40% in 2021. In 2021, 53% of ordinary municipal waste was organic, but only 5% was composted.

Although a high percentage reaches sanitary landfills, of the eight sanitary landfills and three landfills in operation during the development of the NCEP working document by PROMAR, in October 2024 the Ministry of Health warned about the accelerated decrease in the useful life of two of the sanitary landfills located in the country's metropolitan area. In the case of landfills, garbage accumulates on the ground without prior preparation, and the waste is not covered to avoid the release of gases. Finally, in these facilities and others without control, flows of material that reach the sea are generated, as in the case of plastics reported in the 2022 PROMAR-CEGESTI Baseline Study "*Waste identified at monitoring sites in the Caribbean Sea of Costa Rica".*

In 2022, between 41.6% and 51.9% of households separated one or more recoverable or compostable materials according to INEC data, and the average coverage of municipal selective collection according to the 2021 Municipal Management Index reached only 58%.

c)Unsustainable consumption patterns

Costa Rica's Sustainable Production and Consumption Policy 2018-2030 considers that production and consumption patterns at the national level tend to be generally unsustainable.

The State, as the main buyer of the economy, despite having the legal mandate (Integrated Waste Management Law No. 9985) to include sustainable purchasing criteria, presents an incipient panorama where only 0.35% of the contracts in the first half of 2023 (report MH-DCoP-DCPE-UIA-OF-09-2023 of the Ministry of Finance) included this type of criteria. At the level of the general consumer, the predilection for price and quality prevails over socio-environmental criteria.

d) Level of maturity of local governments

The transformation of the economic model, including the proper management of waste and the mitigation and prevention of the leakage of materials into the environment, including the marine environment, requires articulation with local governments to promote the circular flow of resources in their territories.

The country is divided into 84 local governments. According to the 2023 Municipal Management Index, although 99% of municipalities provide waste collection services, selective collection coverage is 58%, 16% of local governments do not have waste disposal or treatment services, 25% do not have collection centers, 15% do not have municipal recoverable waste recovery centers or via agreements and 7% deposit waste in landfill. In general, 52% of local governments are at the maturity level for the circularity of basic integrated waste management and 5% at the initial level.

In addition, 21% of the municipalities do not have waste collection regulations, 39% lack regulations for the disposal and treatment of waste. In addition, 38% do not have municipal plans for integrated waste management.

Creation of the policy and its strategic framework as an input for national dialogue

The process of constructing a NCEP requires carrying out the indicated context analysis, including the determination of the problem to be addressed, its target population, characterization of its effects and consequences, as well as its underlying causes.

The next challenge within PROMAR's support to the government of Costa Rica was to propose measures to resolve the problem and its causes within the scope and progress feasible for a period of no more than ten years and with a measurable results management approach. An important challenge of this mission also included the link and harmonization with other national regulatory instruments such as the National Policy on Integrated Waste Management, the National Bio Economy Strategy, the National Plan for the Prevention of Marine Litter and the National Strategy for the Circular Economy.

The resulting strategic framework was developed in joint work with the State's counterparts and submitted to feedback by other actors to validate its development. Since the Costa Rican regulation, the document has the status of a proposal that allows the initiation of dialogue and national consultation on the subject in accordance with official rules; which also provides a special national value by developing a draft public policy document on a novel topic such as the circular economy.

The PROMAR project fully developed the NCEP, its strategy and action plan, which implied a complete definition by axis of objectives, expected results, indicators, baselines of metrics, goals, strategic actions measurable also with their baseline and goal, responsible parties and deadlines. In addition, the main indicators were detailed in their entirety through their conceptual definition, method of calculation, components, units of measurement, thematic and geographical disaggregation, baseline, goal, periodicity of calculation, source of information and their nature as an indicator of impact, effect or result.

The scope of the strategic framework and action plan developed as an input for the country is given the following generic reference:

a) General objective,

Within the process of joint construction with the official counterparts, a highly challenging component consisted of the formulation of the national objective to be included in the NCEP. After multiple exchanges, it was proposed as an objective that the NCEP seek to support the decoupling of economic growth from the consumption of finite resources in the country, thus reducing the negative environmental and social impact. The objective is proposed, according to the measurable results approach, with specific indicators and goals that address the measurement of economic performance criteria such as GDP per hour worked, but also factors associated with the country's materials account that favor the measurement of the relationship between economic model and resource use. also comparable with the rest of the OECD countries, such as Total Factor Productivity and Resource Productivity. Finally, in environmental matters, the design establishes as relevant to propose to the country the inclusion of the ecological reserve and deficit as a global parameter that, together with the previous ones, measures the achievement of the policy in terms of its global results.

b) Establishment of strategic axes, objectives, indicators and specific goals for measuring progress.

Most of the support provided by PROMAR to the government of Costa Rica was dedicated to the agreement on the strategic axes, strategic framework and derived actions. The following were identified as central themes that guide the course of action of the policy and allow responding to identified critical causes:

- Axis 1: Value addition by circularity
- Axis 2: Responsible consumption for circularity
- Axis 3: Local government maturity level for circularity

The first axis was proposed to increase productivity in the use of resources by facilitating their retention, recovery or value addition in order to maintain their useful life for as long as possible; which promotes, apart from increasing productivity, impacting waste management from the highest section of the waste management hierarchy (avoiding waste, reduce and recover it), with an expected impact of support in the mitigation of waste leaks to terrestrial and marine environments, among others associated with the National Waste Management Policy and the country's marine waste management plan.

The proposed axis addresses fully defined actions, indicators and goals that are recommended to link the policy and its action plan with the promotion of innovation for circularity, the linkage associated with circularity in the flow of resources, the attraction of foreign investment associated with circularity, the strengthening of the market through the generation of technical standards that support the circular economy, and the promotion of markets for recycled materials as raw materials with the respective adoption of national metrics of circular use rates of materials.

The second proposed axis seeks to change the pattern of consumption so that the purchasing criteria incorporate social and environmental considerations in the State and in consumers. Among its actions, indicators and goals, it seeks to strengthen in detail the promotion and use by State entities of the strategic public procurement criteria of law, with its criteria of sustainability and innovation in public procurement; the strengthening of environmental awareness and education in the population to avoid and reduce the generation of waste, as well as to apply circularity measures or, in any given case, to properly value and/or manage the resulting waste, all in order to generate a cultural change in the country.

The third proposed axis is aimed at increasing the level of maturity of local governments in the circularity of integrated waste management, to promote the circular flow of resources in their territories. Its actions, indicators and goals focus both on the promotion and strengthening of the circular flow of resources in the territories or regions of these governments, including technical solutions and the generation of competence for their implementation, but also include actions, indicators and goals to strengthen the municipal administration itself in its organizational management, in order to facilitate the provision of services that favor circularity in the territories by increasing the level of institutional maturity.

Next steps

PROMAR's general objective of preventing marine waste, in particular, plastic waste, is aligned but at the same time expands its impact with the scope of the working document of the National Policy of Circular Economy of Costa Rica that the project has contributed to configure as an input that allows to initiate dialogue and national public consultation.

The transition to a linear economic model proposed by the document is broad, but definitely the actions proposed are also a key component to prevent the generation of waste, including the prevention of marine waste from the perspective of giving value to resources and keeping them in the economic system for as long as possible.

The NCEP working document has been nourished by various national and international sources for its construction and has used valuable inputs from previous PROMAR results; such as the comparative analysis of the regulations on extended producer responsibility in Germany, the Netherlands, Colombia, Chile and Costa Rica, the design of a methodology to measure the baseline of the circular economy for plastic companies, criteria from the guide for the integration of data analysis and marine waste prevention actions in the development of municipal plans for integrated waste management; among others.

The document has been formally delivered to the country's national counterparts in December 2024 in order for it to be an input that facilitates the State to organize the process of technical review by the country's planning experts for its improvement from the approach of managing results for development with which Costa Rica maintains all its official regulations. In addition, the document facilitates the planning and implementation of consultation with different stakeholders in order to review, adjust, improve and validate the instrument; which will most likely change to be strengthened according to the perspectives of the different stakeholders, prior to its approval process and formal publication.

As final recommendations, as shared with the representatives of the State during the presentation of the document, it is recommended to present it as a step forward to initiate the national dialogue that is open to improvement according to the opinions of the various stakeholders. In addition, the importance of considering its nature of content was underlined, especially its dimension as a transition mechanism towards a new economic system apart from its impact on environmental and health matters; as a reference to determine the interested parties to convene for dialogue and consultation.