

Methodological Proposal for the Identification of an Interregional Project Portfolio for the Economic Development and the Exploitation of the Riverine Vocation of Colombia

Propuesta Metodológica para la identificación de un Portafolio de Proyectos Interregional para el Desarrollo Económico y el Aprovechamiento de la Vocación Fluvial de Colombia

DOI: <https://doi.org/10.25043/19098642.171>

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Abstract

The Colombian riverine system is composed by a 27.725km water network distributed in the four major basins (Magdalena, Amazonas, Atrato, Orinoco) along the country. 73.1% of the system can be considered as waterways. However instead of leveraging the potential for the exploitation of this natural resource and the promotion of a riverine transportation system which can impact neighboring populations in social aspects such as health and education, in Colombia the priority is focused to road transportations systems. The National Government, which has adopted the challenges for the sustainability of the planet, has accepted the Sustainable Development Goals (SDG) promulgated by the UN and at the same time has linked the initiative to its 2014 – 2018 National Development Plan. The possibility of connecting the promotion of its riverine vocation and capabilities for solving known socioeconomic needs motivate the creation of this methodological proposal that is driven by the identification of an interregional project portfolio that can be the starting point for closing the diagnosed gaps. At the same time it also makes the accomplish. Went of the goals established by the 2030 Agenda for Sustainable Development, defined by United Nations, feasible.

Key words: SDG, Project Portfolio, National Development Plan, Hydrographic Basins.

Resumen

El sistema fluvial colombiano está compuesto por una red hídrica de 27.725 km distribuidos en cuatro grande cuencas (Magdalena, Amazonas, Atrato, Orinoco) a lo largo del territorio nacional. De esta red el 73.1% es clasificado como navegable. Sin embargo a pesar del potencial que se tiene para el aprovechamiento del recurso natural y el fomento de un sistema de transporte hidroviario que impacte positivamente a las poblaciones ribereñas en temas sociales como salud y educación, en Colombia la prioridad se encamina al modal de transporte terrestre. El Gobierno Nacional adoptando los nuevos desafíos para impulsar la sostenibilidad del planeta, se ha acogido a los Objetivos de Desarrollo Sostenible (ODS) promulgados por la ONU y a su vez los ha enlazado con sus estrategias contempladas en el Plan Nacional de Desarrollo 2014 – 2018. La posibilidad de enlazar el fomento de la vocación fluvial de los ríos del país y sus capacidades de solventar las necesidades socioeconómico conocidas, motivan la creación de una propuesta metodológica orientada a la identificación de un portafolio de proyectos interregional que se constituya en el punto de partida para la solución de las brechas diagnosticadas al tiempo que se cumplan con las metas establecidas por la Agenda 2030 para el Desarrollo Sostenible definidas por las Naciones Unidas.

Palabras claves: ODS, Portafolio de proyectos, Plan Nacional de Desarrollo, Cuencas hidrográficas.

Date Received: January 10th 2017 - *Fecha de recepción:* Enero 10 de 2017

Date Accepted: February 23th 2017 - *Fecha de aceptación:* Febrero 23 de 2017

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Introduction

This paper is intended to present a methodological proposal that allows the identification of a portfolio of interregional projects, focused on the economic development and the exploitation of the fluvial vocation of Colombia.

Motivated by the potential represented by the hydrographic network for the development of the country and the fulfillment of the goals set out in the Agenda 2030 of the United Nations for the sustainability of the planet, this proposal constitutes a contribution to the nation, its Entities, including stakeholders from the public or private sector, for the formulation and structuring of projects and portfolios that can be implemented synergistically between the regions of the national territory.

The initial diagnosis of the Colombian river transport system and the connection between the National Development Plan and the sustainable development objectives raise the need for the generation of this methodological proposal.

The River Transport System in Colombia

The River Transport System in Colombia is constituted by 27,725 km according to the last update of statistics of the sector (*Ministry of Transport of Colombia, 2016*).

73.1% are navigable routes (18,225 km) and 26.29% are the non-navigable waterways (6,500 km).

This network is conformed by four large hydrographic basins, belonging to the Magdalena, Atrato, Orinoco and Amazon rivers.

The distribution of the fluvial arteries by the four basins^{1, 2} of the hydrographic system is shown below in Table 1.

If the infrastructure available for road and rail modes is taken into account, the fluvial mode represents only 10.52% of the national total (Fig. 1).

The fluvial infrastructure available in the year 2015³ allowed 2,460,460 passengers and 3,524,000 tons of cargo to be transported, of which the Magdalena River contributed 53.65% in the transport of cargo (1,890,467 tons) and 54.85% in the transport of people (1,349,503 passengers).

Comparing the number of national passengers transported by land in the year 2015, with those mobilized through the waterways, it is evident that the road modality has predominance in the Colombian system. Table 2.

The relationship between the two compared modes shows that the road modality exceeds approximately 77 times the number of passengers transported by the waterways of Colombia. In other words, the

¹ The Main tributaries by river basin are: A. Magdalena Basin: Magdalena, Canal del Dike, Cauca, Nechí, Cesar, Sinú, San Jorge. B. Atrato Basin: Atrato, San Juan, Baudó, C. Orinoco Basin: Orinoco, Meta, Arauca, Guaviare, Inírida, Vichada, Vaupés, Unilla. D. Amazon Basin: Amazonas, Putumayo, Caquetá, path.

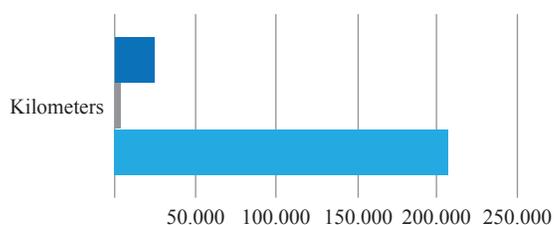
² The navigable and non-navigable sections of the affluents to the different hydrographic basins of Colombia can be consulted in the "Transport in Figures" document of the Ministry of Transport.

³ (Ministry of Transport of Colombia, 2016)

Table 1. Distribution of the Colombian river network by watersheds

Hydrographic Basin	Navigable Length			No navigable length (km)	Total length (km)
	Major permanent	Transitory	Minor permanent		
Magdalena	1.188	277	1.305	1.488	4.258
Atrato	1.075	242	1.760	1.358	4.435
Orinoco	2.555	1.560	2.621	2.161	8.897
Amazonas	2.245	2.131	1.266	1.493	7.135
Total					24.725

Fig. 1. Distribution of the Transportation Infrastructure in Colombia. Road, rail and river modalities



	Kilometers
■ Inland modal	24.725
■ Railway modal	3.529
■ Road modal	206.727

Table 2. Number of domestic passengers transported in Colombia during 2015

National passengers	Road mode	188.836.000
	Air mode	23.116.340
	Inland mode	2.460.460
	Rail mode	458.619

river mode of passenger transport in Colombia represents just 1.3% of those transported by land.

The data presented in Fig. 1 and Table 2 show the predominance of the road mode in the Colombian transport grid.

In consequence to the above, the fleet of road vehicles is the most important in the country with a total of 12,119,782 transport units. Table 3.

Table 3. Colombian transport fleet

Road Mode	Vehicles	12.119.782
Rail Mode	Locomotive	108
	Railway carriage	3.678
Inland Mode	Tugs	173
	Barges	557

Based on this information it is ratified that in Colombia there is an urgent need to leverage fluvial development.

Although the country has 18,225 km of navigable rivers distributed in the Magdalena, Atrato, Orinoco and Amazon basins, it is still not possible to say that Colombia is a fluvial nation. However, it has a vocation to become a fluvial country and to modify the current distribution of the national transport grid.

According to the data presented, in 2015, in just 1.092 km of navigable sections of the Magdalena River, more cargo and passengers were transported than in the remaining 17.133 km available from the national total distributed over the four watersheds. This situation shows that the fluvial development of Colombia has concentrated in the Magdalena River, which represents only 6.37% of the total navigable rivers, since it has the potential to connect the interior of the country with the north coast.

This panorama of the current river system can be regarded as a competitive disadvantage for Colombia. However, it marks a starting point for an improvement opportunity that constitutes rivers as the new focus of economic and social development of the country, through the promotion of the multimodality, with the respective North-south and east-west interconnection, where the productive development centers of the country can communicate with the export ports and where marginalized populations located in regions of low connectivity can have access to the systems of education, health and transport in the country.

The present diagnosis and characterization of the Water road system is constituted as an important information input that supports the generation of interregional projects oriented to promote economic and social development through the use of Colombia's current fluvial vocation.

In this sense, any new project aimed at the fluvial sector of Colombia should focus on the guidelines given by the United Nations for sustainable development in the face of the global strategic scenario defined for 2030, where the eradication of poverty, the protection of the planet is sought to ensure prosperity.

Likewise, these initiatives must be aligned with the current Colombian national development Plan, which is based on three fundamental pillars: peace, equity and education.

For this reason, we provide the background of the Agenda 2030 for the Sustainable Development and the 2014 – 2018 Plan defined by the National Planning Department.

Agenda 2030 for Sustainable Development

Agenda 2030 for sustainable Development has its background in the year 2000 with the formulation of the Millennium Development Goals (MDGs), which were agreed upon by 189 UN member countries. This commitment is focused on achieving the challenges to eradicate poverty, achieving universal primary education, gender equality, reducing infant and maternal mortality, combating the advancement of HIV/AIDS, the sustainability of the environment, and also the promotion of a global partnership for development (*United Nations Development Programme-UNDP, 2015*).

These objectives were divided into a set of 18 quantifiable targets by the definition of 58

indicators, with the maximum deadline for accountability set for 2015.

The measurement of the MDG showed that these objectives were a global success, however, the need to work harder to respond to the immense challenges that have not yet been solved was also clear, such as poverty, education, the environment and peace.

Aware of these challenges and their local needs, Colombia proposed at the Rio + 20 World Summit⁴(United Nations Conference on Sustainable Development), the so-called Sustainable Development Goals (SDGs) with an environmental approach aimed at the protection of bio-diversity.

On September 27, 2015, the Agenda 2030 for Sustainable Development was signed at the United Nations Headquarters in New York⁵, as an action plan for the people, the planet, prosperity, peace and alliances based on a spirit of global solidarity focused on the needs of the poorest and most vulnerable in society with the collaboration of all signatory countries.

⁴ Summit held in the city of Rio de Janeiro – Brazil.

⁵ 193 member countries of the United Nations system signed and agreed on the commitments acquired through the new Sustainable Development Goals (SDS).

Fig. 2. Sustainable Development Goals – SDG. Source: Document: "Objectives of Sustainable Development, Colombia – tools of approximation to the Local context"



17 new objectives are agreed upon (Fig. 2) together with 169 goals that reflect the commitments made with the MDGs in the year 2000. In order to achieve what hasn't been accomplished yet a new term of 15 years has been established⁶.

Colombia The National Development Plan 2014 – 2018 and the SDGs.

With Decree No. 280 of February 18, 2015, by which the High-Level Interinstitutional Commission for the enlistment and effective implementation of the Post-2015 Development Agenda and its Sustainable Development Objectives (SDG) was created⁷, Colombia becomes the first country attached to the United Nations to align and articulate its Development Plan with the SDGs.

In this way the "All together for a New Country" plan in force from 2014 – 2018 was created to contemplate the objectives and strategic goals oriented to the generation and strengthening of the conditions necessary to build a society in peace, equality and educated.

To achieve the articulation between the Development Plan and the SDGs, Colombia is supported by the National Planning Department (DNP), that defined four steps to incorporate these objectives into the Territorial Development Plans (TDP). Fig. 3.

Fig. 3. Steps to integrate SDG with TDP in Colombia



⁶ (United Nations, 2015)

⁷ (Republic of Colombia, 2015)

The DNP proposes a process of integration that begins with the articulation of the government program with the SDGs, it then gives importance to the data by collecting and analysing information on the current state of the territorial entities based on the sustainable development objectives.

Having completed the diagnosis, the next step is the definition of indicators and the programming of the goals to be fulfilled in the Territorial Development Plan (TDP) within the framework of the SDGs:

The process is culminated with the identification of the sources of the resources from the different levels of government to contribute to the compliance with the SDGs by the department or municipality. With regard to this context, it is possible to infer that there is a commitment on the part of the Colombian State to comply with Agenda 2030 for Sustainable Development.

Continuing from this summary of the background of the SDGs and their integration with national development policies, the following proposes a methodology oriented to the identification of a portfolio of interregional projects focused on the fluvial vocation of the country and its potential to generate socio-economic transformation according to the needs of the population.

Methodology for the Identification of the Portfolio of Sustainable Projects Focused on the Fluvial Sector

Aware of the natural richness offered by the Colombian river system and the needs that must be addressed in order to achieve the goals posed by SDG in the country, the Science, Technology and Innovation Management (GECTI) of Cotecmar⁸, as the leader and director of the scientific and technological programs, projects and activities oriented to the fulfillment of its R + D + i Policy⁹,

⁸ Science and Technology Corporation for the development of the Naval, Maritime and Fluvial Industries.

⁹ Research + development + innovation

prepared and proposed the following methodology to identify an interregional portfolio of projects aimed at generating socioeconomic development.

This methodology has been developed based on the conceptualizations studied from the UN (*United Nations Development Programme, 2009*), the generic model for organizational capacity development (*The Model of Organisational Capabilities Development, 2014*), The generic process for capacity-based planning (*The Technical Cooperation Program Joint Systems and Analysis Group Technical Panel 3, 2004*) As well as the Project Management models and standards (*López Ruiz, 2015*).

The methodology consists of 6 highlighted processes:

1. Understanding the Nation's Strategy.

This process is aimed at consulting and assimilating the Current National Government Development Plan¹⁰. This seeks to obtain clarity on the mission and vision of Colombia regarding its guidelines for development initiatives¹¹ and how they are articulated with the SDGs. (Fig. 4).

2. Identification of Territorial Needs.

Having assimilated the national strategy, the next stage is to identify the territorial needs that exist in the different departments. The Territorial Development Plans (TDP) should be taken as the information input.

¹⁰ This plan corresponds to the 2014 – 2018 term and has been called "All together for a New Country".

¹¹ (National Planning Department-DNP, 2015).

With the TDPs it is necessary to study the diagnosis of each department in relation to all its socioeconomic issues, to identify the baseline of needs and the gaps that need to be corrected, as well as the goals and indicators that have been proposed by the governor's offices to enforce the development plans. This process will provide an outlet for identifying needs that have potential for the development of territorial capabilities in the country. (Fig. 5).

3. Categorize needs

This process has been devised to classify the needs with potential to generate territorial capacity, according to the sectors¹² and their relationship with the SDGs. (Fig. 6).

4. Evaluate and select needs by category

On the needs have been categorized they are sent for evaluation and selection.

The first evaluation is based on the potential that these needs have to generate capabilities that promote the development of the river sector and the impact they can have on Education, health and transportation.

According to the foregoing, it is evident that the methodology gives explicit priority to only 3 sectors out of the 18 defined by the governor's offices¹³.

¹² 1. Agricultural, 2. Drinking water and basic sanitation, 3. Environment 4. Vulnerable groups response, 5. Prisons, culture, 6. Sport and Recreation, 7. Community Development, 10. Education 11. Municipal equipment, 12. Institutional strengthening, 13. Justice and Security, 14. Disaster Prevention and Response, 15. Promotion of development, health, 16. Public services, 17. Transport 18. Housing.

¹³ The same as 12.

Fig. 4. Process 1-inputs and outputs



Fig. 5. Process 2-inputs and outputs

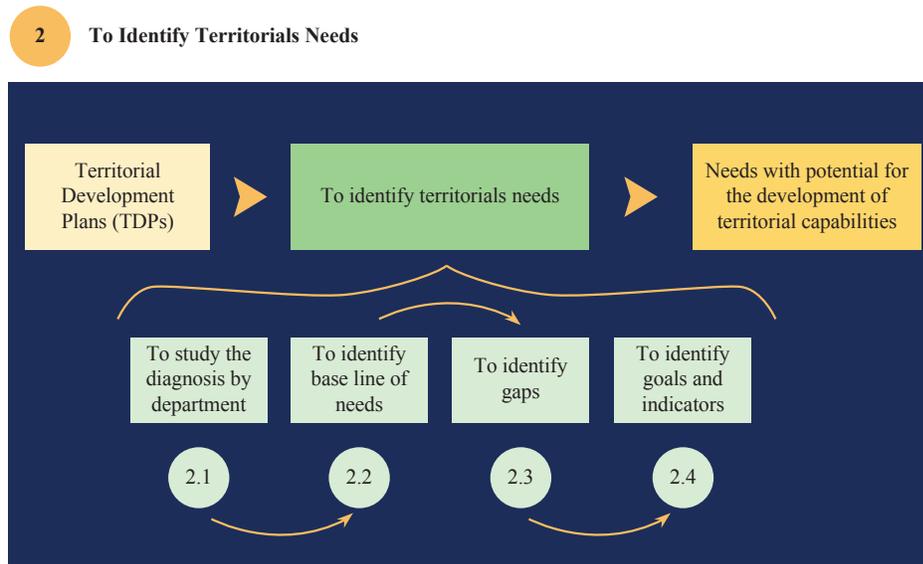
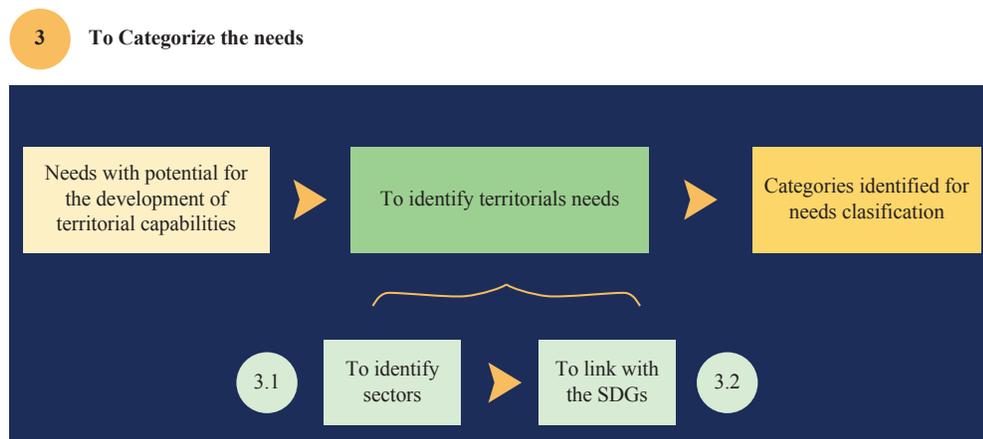


Fig. 6. Process 3 – inputs, subprocesses and outputs



The second evaluation looks at the latent potential so that the needs can be transformed into initiatives that can be developed across regions.

The evaluations will give way to the selection of needs to be transformed into project proposals for the development of regional and interregional capacities for the fluvial sector, with impact on the health, education and transport of the riverside communities (Fig. 7).

5. Prioritize projects

Based on the selection, the projects must be prioritized in compliance with risk criteria,

opportunities for closing gaps and budgetary availability. This will be delivered as an output of the expected Portfolio of Projects. (Fig. 8).

On the subject of budgetary availability, the DNP provides the general public the *Royalties map*¹⁴ tool which allows the projects and the budgets in the country financed through royalties to be consulted. It is suggested to use this application to obtain an initial approximation of the budget that is used to finance the projects within the portfolio.

¹⁴ Available at kiterritorial.co

Fig. 7. Process 4 – inputs, subprocesses and outputs

4 To evaluate and to select needs by categories

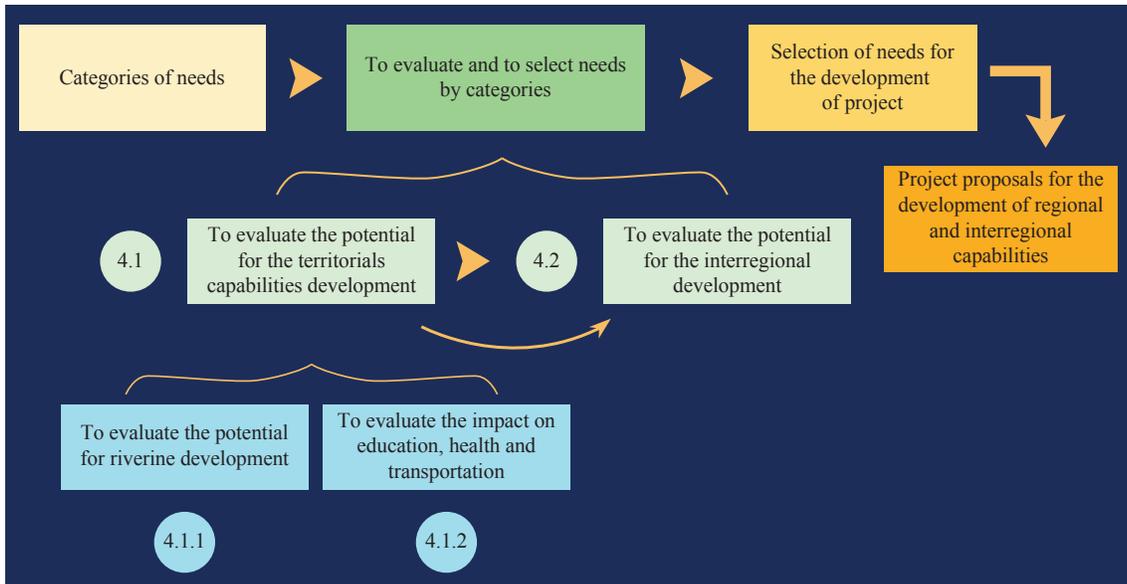
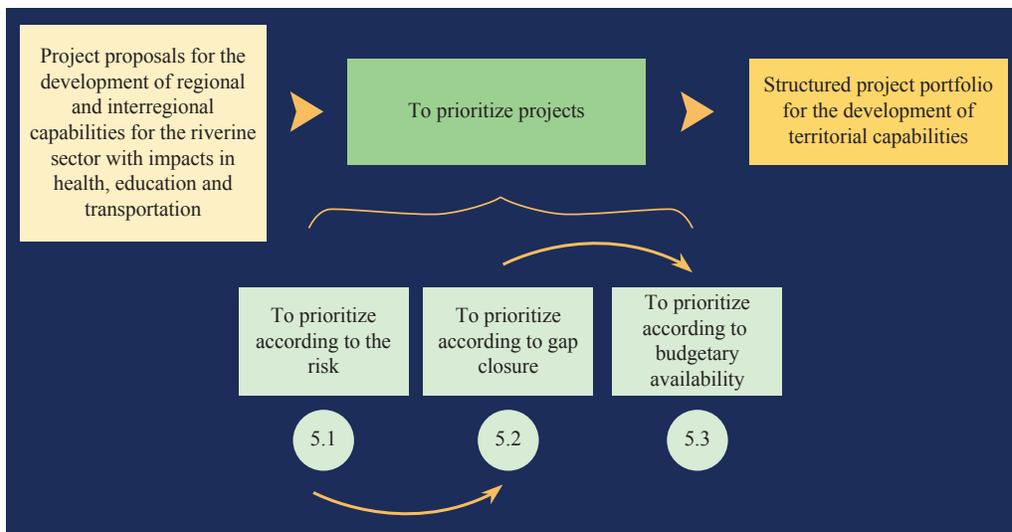


Fig. 8. Process 5 – Inputs, subprocesses and outputs

4 To prioritize projects



6. Submit the portfolio of projects to evaluation and approval

This process constitutes the final stage of the methodology. After having structured the portfolio of projects¹⁵, it is necessary to disseminate them with stakeholders and potential sponsors to propose financing strategies and to submit initiatives for evaluation and approval. Depending on the evaluations made by the stakeholders, the projects are likely to require refinement or adjustment for approval. If this is the case then the process that is relevant to its improvement must be revisited.

Conclusions

Thanks to the research it was found that Colombia must make efforts to promote and consolidate its fluvial sector, with its great potential for the generation of socioeconomic impacts through the leverage of all the navigable arteries for the establishment of a transport system that supports the health and education issues of these riverside communities that are disconnected or isolated from the country's development centres.

This reality motivated the creation of a methodological proposal oriented to the identification of a portfolio of projects that is constituted by support to the development of the fluvial potential of the country.

Considering the strategic vision of the national Government in accordance with the sustainable development objectives (SDG), the portfolio of projects that emerge as a result of the application of this methodology, must ensure the connection between the needs identified by the governor's offices of the departments and the use of rivers

¹⁵ Each project within the portfolio should be structured according to the DNP's policies for standardization, which seeks to improve the quality and efficiency of public investment (National Council for Economic and Social policy, 2015).

as a development axis to generate interregional territorial capacities.

The methodological proposal has not yet been proved, therefore, the implementation of a pilot is suggested, which can be constituted as an opportunity for improvement based on the criterion of experts in the field and those interested in developing portfolios for the development of the national capacities focused on the attention and fulfillment of the goals established by SDG.

Although this approach has been focused towards the fluvial sector, it can be adapted for its application in other sectors, considering that the conceptualization that sustains its development comes from generic structures oriented to the development of capabilities.

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