Advances on the methodology for the Inland Waterways Classification for South America

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Main topics

Process and mechanisms

Objectives and scope

Best practices

Methodology

Main topics

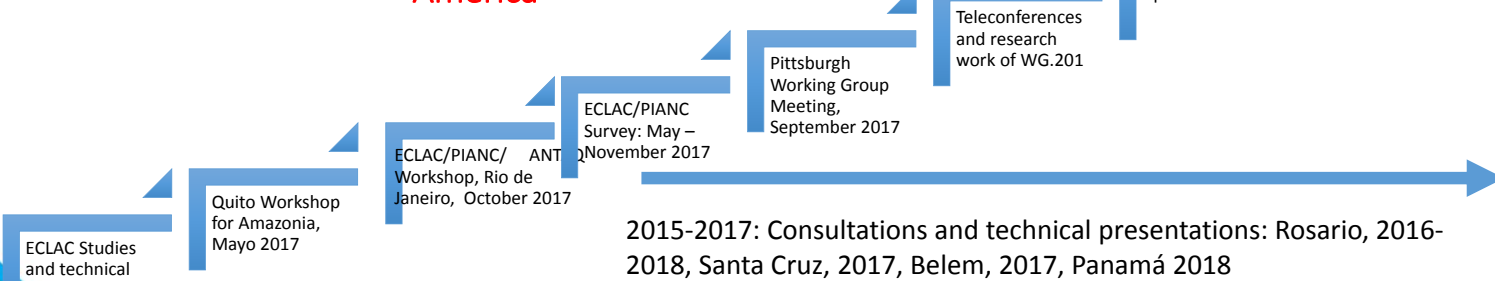|	
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3

ELCAC/PIANC Working Group 201: "Development of a Proposal of Inland Waterway Classification for South America"

❑ **A Joint ECLAC/PIANC Working Group**, set up in 2016, following the PIANC/ECLAC/ANTAQ Workshop on Inland navigation and a more sustainable use of natural resources: networks, challenges and opportunities for South America (Rio de Janeiro, 19 October 2016)

❑ The aim of this Working Group is to **develop a proposal of national/regional inland waterways classification for South America**, which will include:

1. A proposal on the **scope, goals and general structure** of the inland waterways classification

2. **Analysis of the relevant background information** for technical and operational criteria, including, but not limited to:
    a. An analysis of the fleet situation in South America
    b. An analysis of the waterway data in South America for the purpose of the classification

3. **Proposed structure and parameters** for the classification for inland waterways, including:
    a. Main categories and types of inland waterways;
    b. Operational parameters;
    c. Technical parameters.

4. **Proposal for a strategy of implementing, maintaining and updating a common waterway classification in South America**, including:
    • The criteria fitting with the requirements to adapt waterways to the parameters,
    • The criteria fitting with maintaining and further developing the system of classification,
    • A general agreement/policy to define mutual rights and obligations, in particular for multi-national waterways or transport relations

❑ An **Expert** group

❑ Balanced **geographical representation**

❑ Discussions and **recommendations**

❑ Identification of **options and possible solutions**

❑ **Inputs and proposal to the relevant regional forums** in South America

4

Developing a proposal for Inland Waterways Classification in South America

ECLAC Studies and technical assistance

Quito Workshop for Amazonia, Mayo 2017

ECLAC/PIANC/ ANTAQ Workshop, Rio de Janeiro, October 2017

ECLAC/PIANC Survey: May – November 2017

Pittsburgh Working Group Meeting, September 2017

Teleconferences and research work of WG.201

Brasilia Meeting, April 2018

Panamá, May 2018

2015-2017: Consultations and technical presentations: Rosario, 2016-2018, Santa Cruz, 2017, Belem, 2017, Panamá 2018

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IW classification as a tool for public policies

Public policy perspective

- ❑ Measuring and monitoring the state of IW infrastructure.
- ❑ IW inventory which facilitate inter-modal integration
- ❑ Basis for estimating the investment gap, maintenance needs and impact of new investments,
- ❑ Facilitate access to financing.
- ❑ Incorporate sustainability concerns,
- ❑ Common basis for bilateral and regional agreements.

Private sector/user perspective

- ❑ Information on the navigation conditions
- ❑ Ease of navigation
- ❑ Security of navigation
- ❑ Standards for RIS
- ❑ Better conditions for industrial development (naval constution)
- ❑ Parameters for estimating costs and benefits of investments in fleet, new infrastructure and maintenance

One of the main difficulties for estimating the needs of the investment is that there is no updated and detailed inventory of the state of the river infrastructure, which can serve as a basis for an estimate of the costs of infrastructure works (Plan Maestro fluvial,

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Main objectives of a common regional classification of South American inland waterways

(survey and discussions)

- ❑ Supporting inland waterways and, more generally, transport policies and projects in **Infrastructure development and operation**:

  - ❑ Planning,
  - ❑ Monitoring and
  - ❑ Identifying missing links and bottlenecks that should be prioritized;

- ❑ Increasing **safety and ease of navigation** by ensuring the orderly and efficient control and maintenance of waterways;

- ❑ Facilitating the **planning of regional integration project**s;

- ❑ Achieving **a more sustainable use of inland waterways (and transport in general).**

Quality criteria for classifications

The South American classification should:

- ❑ Introduce a hierarchy of classes, this guarantees that a vessel or convoy normally operating on waterways of one class could be used on waterways belonging to a higher category without restriction as to the parameters covered by the classification;

- ❑ Be forward-looking in its design, specifying the parameters to be complied with when constructing new or modernizing existing inland waterways with the objective of contributing to the sustainable development of the entire region, that is, to establishing an integrated, comodal and sustainable transport network at the national and regional level through integrated and sustainable policies for logistics and mobility;

- ❑ Be based on the specific conditions of navigable waterways in South America and, in this sense, be able to:

  - • Be applied to the widest possible area of South America;

  - • Adapt to future developments in the technology of inland navigation.

  - • Incorporate waterways of diverse characteristics, given the important social and economic function of some sections at the local level.

  - • Be sufficiently dynamic and flexible to accommodate the diversity of navigation conditions related to hydrography and climate.

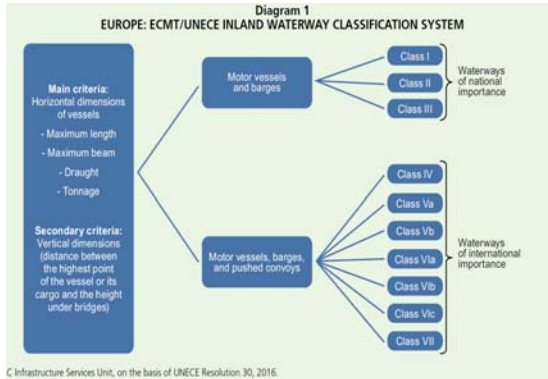- ❑ Be applied easily and in a simple way and be easily understood by different stakeholders

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Main topics
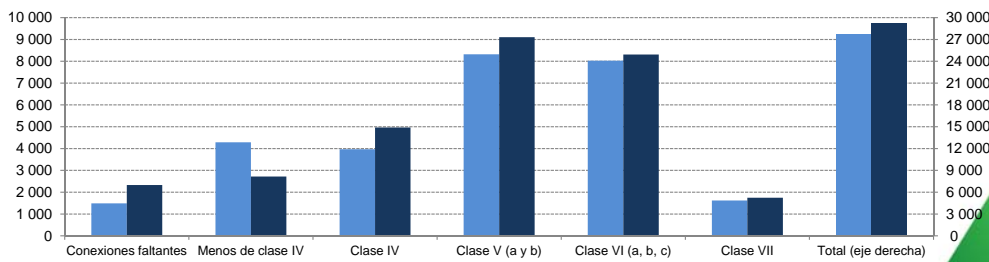
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Slide 1

ECMT/UNECE Classification

Diagram 1
EUROPE: ECMT/UNECE INLAND WATERWAY CLASSIFICATION SYSTEM

Main criteria:
Horizontal dimensions of vessels
- Maximum length
- Maximum beam
- Draught
- Tonnage

Motor vessels and barges → Class I, Class II, Class III → Waterways of national importance

Secondary criteria:
Vertical dimensions (distance between the highest point of the vessel or its cargo and the height under bridges)

Motor vessels, barges, and pushed convoys → Class IV, Class Va, Class Vb, Class VIa, Class VIb, Class VIc, Class VII → Waterways of international importance

C. Infrastructure Services Unit, on the basis of UNECE Resolution 30, 2016.

Fuente: Jaimurzina y Wilmsmeier , 2016.

Chart categories: Conexiones faltantes, Menos de clase IV, Clase IV, Clase V (a y b), Clase VI (a, b, c), Clase VII, Total (eje derecha)

Slide 2

The Brazilian Waterway Classification System

❑ Developed by the Brazilian Departamento Nacional de Infraestrutura de Transportes (DNIT), and was codified on 13 September 2016 in Administrative Bulletin Nº 172, Portaria Nº 1.635 (see Appendix A for the Brazilian Policy).

❑ Based on "studies and plans already published by Agencies and Organizations in the Waterway Sector and more than 40 years of surveys about the principle rivers that are currently in the Federal System (SFV)".

❑ Defines **the design vessel dimensions for length and width**, and **includes a parameter in the system for minimum operational waterway depth** (not vessel draft). The classification system is presented in Table 1 and 2.

Table 1: Classes in the Brazilian System of Design Vessels

Class	Maximum Width (B), m	Length (L), m
I	48	280
II	33	210
III	25	210
IV	23	210
V	16	210
VI	16	120
VII	12	140
VIII	12	80
IX	12	50

Table 2: Sub-Classes (Categories) in the Brazilian System based on Waterway Depth

Category	Minimum Operational Depth (P), m
Special	P > 3.50
A	3.50
B	3.00
C	2.50
D	2.00
E	1.50
F	1.00

IW Classification in Colombia

❑ Two attempts to classify the waterways in Colombia: by the DNP (Departamento Nacional de Planeación) and Ministry of Transport in 1994 and by the Ministry of Transport in 2000.

❑ The classification of 1994 categorizes the national fluvial network in "**primary" or "secondary"**, **depending if the waterway has an important flow of cargo or is mainly dedicated to regional activities** (to take also into account the social benefit of a waterway). It should be highlighted that already from these first classification efforts, the need of a social component was found necessary when classifying a waterway in a Latin American country, and not only make a classification based on economic variables or volumes of transported cargo.

❑ The Manual of Navigable Rivers published by the Ministry of Transport in 2000 is the second attempt of classification. The waterways are categorized in this document **in "major"** (which can be "permanent" of "transitory" depending if the river is navigable the whole year or is interrupted in the summer periods) **and "minor" navigation**. And this classification is the result of extrapolating for waterways the classification **in "major" and "minor" vessels** made by the ministry of Transport in 1999 for the Colombian fleet. "Major vessels" are those with a DWT higher or equal to 25 Ton; and therefore, "major waterways" are those with capacity to allow the traffic of "major vessels".

❑ The concerns and limitations of the existent classifications are already recognized by the fluvial sector, which would embrace a new more formal classification knowing the benefits this brings with a stronger and clear frame to perform their profession.

Minimum depths guaranteed in Argentina

Main recommendations and conclusions

❑ Classification to cover "shallow waters"
❑ Three sets of the criteria for classification:
  ❑ Physical capacity of the waterway
  ❑ Quality of the services to the navigation
  ❑ Sustainable use of inland waterways [Later addition]
❑ Physical capacity of the waterways measured in accordance with
  ❑ The main challenge to the navigability of inland waterways, which is the operational depth of the waterway navigation channel,
  ❑ The regional experience of the State's intervention in IW infrastructure (guaranteeing the minimal depth),

  And complemented by other elements, related to the recommended dimensions of the fleet, if possible.

❑ Issue of availability and reliability

Calado garantizado:
654 km, calado 10´
132 km, calado 25´
680 km, calado 34´

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15

IW classification based on the concepts of an infrastructure service and sustainability

Sustainable management or governance

Services offered and their quality

Physical Capacity of the waterway
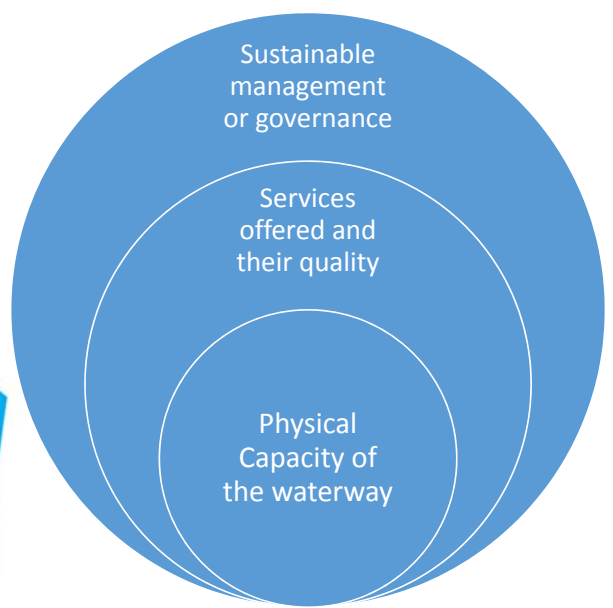
A: Highest
Quality/performance

B - F: Lower grades
Quality/performance

X: Unknown
Information not available

STEP A: Assessing the physical capacity
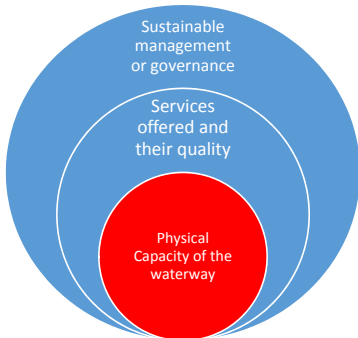
Example: a stretch of the waterway with minimum depth of 2 m, where the maximum beam of 25 and maximum length of 80 m, shall be classified as D-(C-E).

Parameters for classification of the physical capacity of the waterway for the transport of cargo or passengers

❑ The primary parameter for the classification, according to capacity of the waterway, shall be the guaranteed minimum water depth of the navigation channel.

❑ The primary parameter shall be complemented by the division based on the limits to the values for the vessel's and convoy's length and beam during the period of low water conditions.

Classes according to the capacity of the waterway

Class	Minimum operational depth (m)	Maximum beam of the vessel or convoy (m)	Maximum length of the vessel or convoy (m)
A	3,5	48*	280*
B	3,0	33*	210*
C	2,5	25*	120*
D	2,0	23*	140*
E	1,5	16*	80*
F	1,0	12*	50*
X	Data not available	Data not available	Data not available

Note: the value of the intervals shall be determined through analysis of the available fleet data.

# STEP B: Parameters for classification of the level of the services provided on the waterway
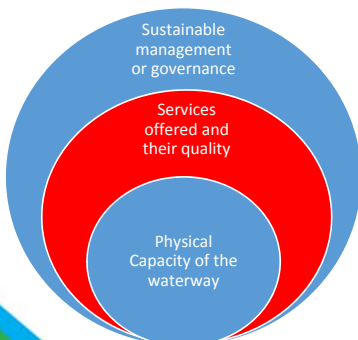
❑ Establish a "services" matrix to define the classification according to level of service

❑ Gradual approach to the services: from basic to advanced

❑ Work in progress

	Continued Navigation 365/365*	Continued Navigation 24/7	RIS	AIS	Intermodal connections	Navigation signs and signals	TBC	Navigational charts	Hydrographic Surveys
A	x	x	x	x	x	x	x	x	x
B		x	x	x	x	x	x	x	x
C			x	x	x	x	x	x	x
D				x	x	x	x	x	x
E					x	x	x	x	x
F						x	x	x	x
X	Data not available	Data not available	Data not available	Data not available	Data not available	Data not available	Data not available	Data not available	Data not available

Example: a stretch of the waterway with the maximum level of services shall be classified A. The waterway offering minimum level of services shall be classified F. The waterway missing RIS and AIS services and not offering continued navigation shall be classified: E. The waterways offering all services but RIS and AIS shall be classified [TBC].

STEP C: Parameters for classification of the quality of the management of the waterway
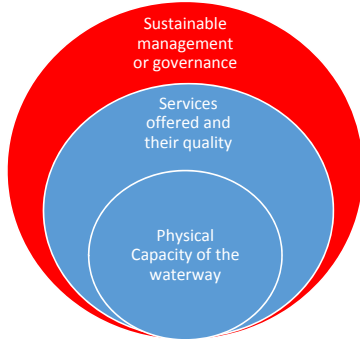
Class	Environmental sustainability	Social sustainability	Economic sustainability	Institutional sustainability
A	x	x	x	x
B		x	x	x
C			x	x
D				X
E	Two of the four.			
F	No management system in place			
X	Information not available			

- **Institutional sustainability**: existence of the dedicated institutions in charge of the waterway's development and effective coordination scheme and division of responsibilities;

- **Economic sustainability**: existence of investment plans and financing schemes for the development of the waterway;

- **Social sustainability**: existence of the rules and practices to deal with the social implications of the waterway development;

- **Environmental sustainability**: existence of the rules and practices to deal with the environmental implications of the waterway development;

IW classification based on the concepts of an infrastructure service and sustainability
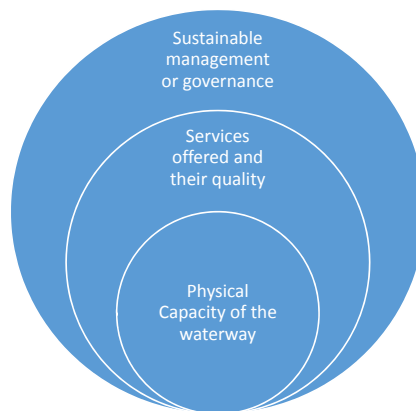
- ❑ A waterway with maximum capacity, the maximum level of service and the best management system shall be classified: **A-A-A**.

- ❑ A waterway with maximum guaranteed depth but limitations in the beam and length of the vessels, the intermediate level of service and the limited management system shall be classified: A (B-F)-D-E.

- ❑ Where information is not available, the classification can be B(X-X)-B-X.

- **Flexibility and possible addition of criteria**

- **Possible partial and gradual application**

- **Identification of the weakest links and weaknesses**

- **Synergies and potential for the incorporation of the technical standards**