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Safety of domestic ferries: A scoping study of seven high-risk countries

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WORLD MARITIME UNIVERSITY

ARCSILEA
A Specialist Maritime Consultancy

INTERFERRY
Representing the Ferry Industry Worldwide

LR Foundation

SAFETY OF DOMESTIC FERRIES

A SCOPING STUDY OF SEVEN HIGH-RISK COUNTRIES

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List of abbreviations

AMSA	Australian Maritime Safety Agency
ANAM	Agence National des Affaires Maritimes (National Agency for Maritime Affairs)
ANSD	Agence Nationale de la statistique et de la Démographie (National Agency for Statistics and Demography)
AO	Administrative Orders
ASEAN	Association of South-East Asian Nations
BIWTA	Bangladesh Inland Water Transportation Authority
BIWTC	Bangladesh Inland Water Transport Corporation
BMPV	Baird Maritime Passenger Vessel accident database
BSC	Bangladesh Shipping Corporation
BUMD	Local State-Owned Corporation
CICOS	Commission Internationale du bassin Congo-Oubangui-Sangha (International Commission of the Congo-Oubangui-Sangha Basin)
CIWT	Coastal and Inland Waterways Transport
CMM	Code of Merchant Marine
COLREGS	Convention on International Regulations for preventing Collisions at Sea
COREFFN	Council for the Regulation of Freight Forwarding in Nigeria
CPI	Corruption Perceptions Index
CRFNI	Centre Régional de Formation en Navigation Intérieure (Regional Training Centre for Inland Navigation)
CVM	Congolaise des Voies Maritimes (Congo Authority of Maritime Routes)
DGLT	Directorate General of Land Transportation
DGST	Directorate General of Sea Transportation
DMM	Directorate of Merchant Marine
DMVN	Direction de la Marine et des Voies Navigables (Directorate of Maritime and Waterways)
DNV	Det Norske Veritas
DPD	Dewan Perwakilan Daerah (Council of Regional Representatives)
DPTMI	Direction des Ports de Transport Maritime Intérieur (Directorate of Secondary Inland Ports)
DRC	The Democratic Republic of the Congo
DVDA	Direction des Voies de Desserte Agricole (Directorate of Agricultural Service Roads)
DWT	Dead Weight Tonnage
EDF	European Development Fund
EEZ	Exclusive Economic Zone

EU	European Union
GDP	Gross Domestic Product
GT	Gross Tonnage
HASSMAR	High Authority for Maritime Safety, Maritime Security, and the Protection of the Marine Environment
IACS	International Association of Classification Societies
ICAO	International Civil Aviation Organisation
IIAG	Ibrahim Index of African Governance
ILO	International Labour Organization
IMF	International Monetary Fund
IMO	International Maritime Organization
ISM Code	International Safety Management Code
ITCP	Integrated Technical Cooperation Programme
IWT	Inland Water Transportation
LASWA	Lagos State Water Authority
LLC	International Convention on Tonnage Measurement of Ships
LMDG	Liaison Maritime Dakar-Gorée (Maritime Link Dakar-Gorée)
LRF	Lloyd's Register Foundation
LSG	Lagos State Government
MARINA	Maritime Industry Authority
MARPOL	International Convention for the Prevention of Pollution from Ships
MBca	Motor Banca
MC	Memorandum Circulars
MIDP	Maritime Industry Development Plan
MIKC	Maritime Innovation and Knowledge Center
MMAF	Ministry of Maritime Affairs
MoS	Ministry of Shipping
MoT	Ministry of Transportation
MRP	Majelis Permusyawaratan Rakyat (People's Consultative Assembly)
MTP	Multimodal Transport Project
MTVC	Ministère de Transports et de Voies de Communication
MV	Motor Vessel
NCVS	Non-Convention Vessel Standards
NIMASA	Nigerian Maritime Administration and Safety Agency
NIWA	National Inland Waterways Authority
NPA	Nigerian Ports Authority
NRCC	National River Conservation Commission

OECD	Organization for Economic Cooperation and Development.
ONATRA	Office National des Transports (National Agency of Transport)
PAD	Port Autonome de Dakar (Autonomous Port of Dakar)
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PCG	Philippine Coast Guard
PPA	Philippine Ports Authority
PSSRS	Philippine Ship Safety Rules and Regulations
RCA	Root Cause Analysis
RO	Recognized Organization
RRP	Dewan Perwakilan Rakyat (Council of People's Representatives)
RVF	Régie des Voies Fluviales (River Routes Authority)
SAR	Search and Rescue
SCTP	Société Commerciale des Transports et des Ports (Commercial Company of Transport and Ports)
SNCC	Société Nationale des Chemins de Fer du Congo (National Railway Company of Congo)
SOLAS	International Convention for the Safety of Life at Sea
SONAPAD	Société Nationale du Port Autonome de Dakar (National Company of Autonomous Port of Dakar)
SOP	Standard Operating Procedures
SVN	Services des Voies Navigables (Navigable Routes Services)
STCW	International Convention on Training, Certification and Watch-keeping of Seafarers
SUMATRA	Surface and Marine Transport Regulatory Authority
TASAC	Tanzania Shipping Agencies Corporation
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
USD	United States Dollar
VTMS	Vessel Traffic Management System
WBG	World Bank Group
WFSA	Worldwide Ferry Safety Association
WGI	Worldwide Governance Indicators
WMU	World Maritime University
WRP	World Risk Poll
ZMA	Zanzibar Maritime Administration

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EXECUTIVE SUMMARY

Ferry transport is frequently associated with accidents and fatalities in many countries. Deadly ferry accidents are fairly common, and globally, ferry accidents have caused countless deaths and injuries. Even a single accident can, at times, cause fatalities in the order of hundreds of lives besides property loss. It is no coincidence that ferry transportation is an integral part of the domestic transport infrastructure in many countries, particularly archipelagic countries such as Indonesia and the Philippines, river deltaic countries like Bangladesh, countries with extensive riverine systems such as the Democratic Republic of the Congo and Nigeria, or even a combination of great lakes, rivers and archipelago such as Tanzania. Incidentally, these are the very countries experiencing a high number of accidents and fatalities over the past two decades and, therefore, considered high-risk countries in the ferry transport sector.

The international community is continuously seeking to enhance safety in the domestic ferry industry. Thus, as part of the ongoing initiatives, under a generous grant kindly provided by the Lloyd's Register Foundation through Interferry, the World Maritime University conducted scoping study on the safety of domestic ferry industries in seven high-risk countries - Bangladesh, Indonesia, the Philippines, the Democratic Republic of the Congo, Tanzania, Senegal, and Nigeria as identified through accident records in the Arcsilea database.

The study uses a structured approach to identify focus areas in the seven countries for enhancing safety in the domestic ferry sector. Unsafe occurrences are the obvious driver and motivation. However, the impact of a safety intervention in a country will clearly depend on several different factors such as the country's maritime profile, industry demographics and stakeholder matrix, regulatory and governance climate, political landscape, and amenability to change and external intervention. While narrowing down the evaluation criteria based on the aforesaid factors, limitations in the availability of data were an important consideration. Eventually, fifteen distinct criteria are identified against five attributes as an aid to the decision-making in a country for considering a safety intervention with a high likelihood of success and a significant positive impact on safety in the domestic ferry sector.

Analysis of accident data yielded current hazards threatening the safety of domestic ferries in each of the seven countries and their role in the formation of unsafe occurrences. The study further identified the key stakeholders of the domestic ferry sector and their state of play in the safety system. The national regulations related to the safety of domestic ferries are also identified and broadly examined for alignment with the IMO model regulations. Furthermore, the national political landscape, state's willingness to facilitate and receive a safety intervention, and public attitude towards safety are examined in the respective countries using globally recognized indices, questionnaire survey and personal interviews.

Whereas specific needs and a detailed roadmap would need to be developed while planning a safety intervention in any country, in the light of the study results, we have reason to believe that there are certain basic, common needs integral to the improvement of domestic ferry safety regardless of the country. The identified key components required to be established in the domestic ferry safety system include clearly assigned authorities and responsibilities, well-defined vessel classification, digital ferry register, minimum competency requirements, training facilities, safety management training, embarkation and departure controls, aids to navigation and shore infrastructure, and occupational health and safety standards. Secondary actions to sustain the safety system would include continuous improvement through safety inspection and monitoring of fleet, survey and certification of domestic ferries, including new building, imported, repair, modification or conversion, monitoring passenger transport statistics, and diligent safety investigation and follow-up of marine casualties and incidents.

1 INTRODUCTION

1.1 Background

Since ancient times, ferries have been widely used to transport passengers and cargo.[1] Although passenger transport by sea has been ceding volume, especially during the past two decades, to aviation and road transport, passenger numbers on ferries worldwide appear to remain at par with aviation.[2]

Ferry transportation is an integral part of the domestic transport infrastructure in many countries, particularly archipelagic countries such as Indonesia and the Philippines, river deltaic countries like Bangladesh, countries with extensive riverine systems such as the Democratic Republic of Congo and Nigeria, or even a combination of great lakes, rivers and archipelago such as Tanzania.

A ferry is a multipurpose ship or craft used for both, passengers and freight. It carries passengers, cargo, and sometimes even vehicles over short-distances across coastlines and islands[3-4]. Cost-efficiency namely, affordable prices for long-distance travel compared to other modes of travel makes ferries a favoured means of domestic passenger transport.

Incidentally, this reliance on ferry transport is frequently associated with frequent accidents and fatalities in many countries.[5] Deadly ferry accidents are fairly common, and globally, ferry accidents have caused countless deaths and injuries. Since ferries carry many people and goods, a single accident can cause several fatalities besides property loss. For example, at least 60 persons drowned in the Democratic Republic of the Congo in 2021 when an overloaded ferry

[1] Kirillova, Y. V., & Meleshenko, Y. S. (2014). Justification of financial safety analysis approach in cargo-and-passenger ferry operations management. *Transport and Telecommunication, 15(2)*, 111.

[2] Oxford Economics study, 2021.

[3] Cai, W., Liu, W., Wan, S., & Zeng, Q. (2021, June). Evaluation Study on Integration of Comfort and Energy Efficiency Models in Cruise Ship. In *International Conference on Offshore Mechanics and Arctic Engineering* (Vol. 85161, p. V006T06A036). American Society of Mechanical Engineers.

[4] op. cit. 1

[5] Talley, W. K. (2002). The safety of ferries: an accident injury perspective. *Maritime Policy & Management, 29(3)*, 331-338.

carrying 700 passengers capsized.[6] In April 2021, an overcrowded boat sank in Bangladesh consequent to a collision, killing 34 passengers.[7]

Safety records appear to be clearly distinguished between developed and developing countries. Generally, within and between OECD[8] countries, the domestic passenger ferry sector maintains a high safety level with less than one fatality per 100 million passengers annually.[9] However, a safety record of around 1,000 deaths annually is the norm among emerging economies. Between 2010-2019, 99.5% of all known ferry fatalities worldwide occurred on domestic voyages in non-OECD countries.[10]

The common nature of ferry accidents in coastal and inland waters raises safety questions not only in the light of the current situation, but also in the context of the evolution of the safety threats with respect to the future sea traffic, increasing offshore energy exploration and production including the construction of offshore windfarms, etc. There appears to be a strong case for examining passenger ferry accidents in coastal and inland navigation, especially in the emerging economies with significant fatalities.

1.2 Drivers and motivation for the study

Ferry fatalities

The first driver for this study is the ferry fatalities in non-OECD countries. Between 2000-2021, seven countries experienced a high number of deaths in the ferry transport sector, including the People's Republic of Bangladesh, the Republic of Indonesia, the Republic of the Philippines, the Democratic Republic of the Congo, the United Republic of Tanzania, the Republic of Senegal, and the Federal Republic of Nigeria (Figure 1.1). These seven countries are, therefore, identified as the scope of application of the study.

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[6] https://www.theguardian.com/world/2021/feb/16/congo-river-boat-sinks-deaths-missing

[7] https://www.nytimes.com/2021/04/05/world/asia/bangladesh-ferry-crash.html

[8] OECD stands for the Organization for Economic Cooperation and Development.

[9] Interferry. (2019). *Report on the fact-finding mission to the Philippines*. https://interferry.com/wp-content/uploads/2019/10/FERRYSAFE_Report_OCT19_onlineFINAL.pdf

[10] Interferry assessment, 2019, based on data from ShipPax and BMPV accident database.

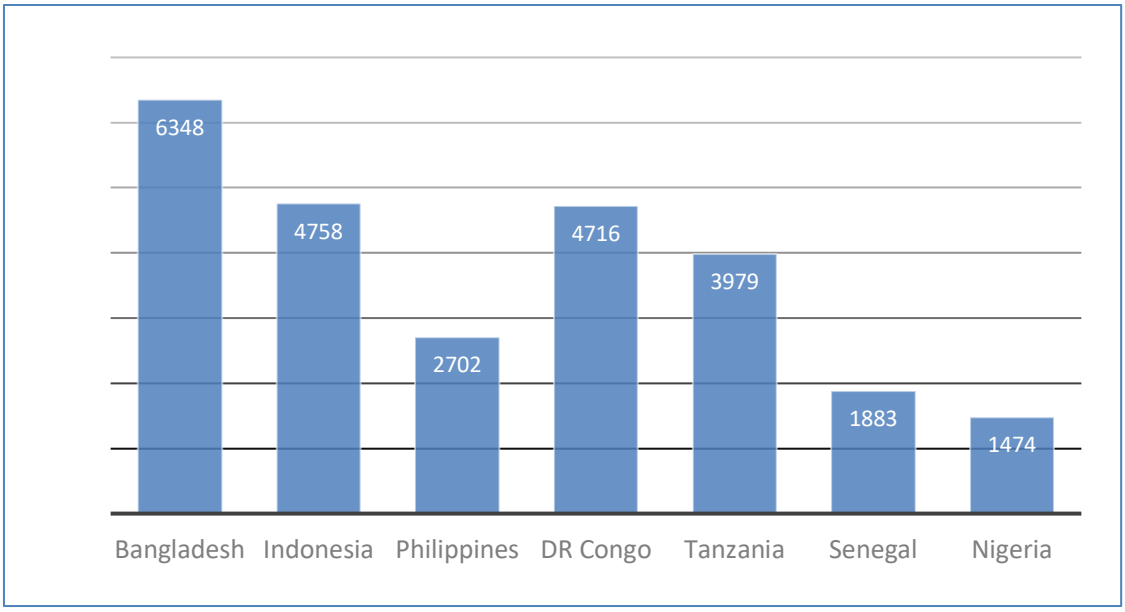


Figure 1.1. Total domestic ferry fatalities 2000-2021 (Source: BMPV[11])

Frequency and likelihood

Unlike other means of transport, ferry accident statistics can be heavily influenced by rare, catastrophic events. Therefore, country statistics must be viewed from a long-term perspective. An example is the *Estonia*, which remains in the top-ten list for ferry fatalities since records began, owing to a rank which is based on just one accident, the 1994 sinking of the ferry *Estonia* in the Baltic Sea, with the loss of 852 lives. A second example is Senegal, where the catastrophic ferry accident involving the *Le Joola* claimed 1,863 lives in September 2002. While Estonia now operates under robust regulations following the International Maritime Organisation (IMO) and the European Union (EU), there may be a case to examine how and to what extent Senegal has improved its safety regulations over time. A third example is Tanzania, whose statistics are dominated by the over 2,900 deaths on the *Spice Islander* in September 2011 alongside another 1,000 fatalities spread over approximately 20 accidents since 2001. The statistics for Tanzania indicate a high risk of a major ferry accident.

[11] Baird maritime passenger vessel accident database (BMPV)

Governing conditions

Yet another factor to consider is the governing conditions for ferry services, which may influence the probability of a fatal accident and the opportunity to save passenger lives. Ferry operations can be divided into four groups: lake, riverine, coastal, and open waters operations, each of which presents a different set of complexities in different countries. Further, local conditions such as seasonal weather, national festivities, general infrastructure investment, labour skills, corruption, and many other factors would influence the overall safety envelope for domestic ferry operations. As such, IMO's International Convention for the Safety of Life at Sea (SOLAS) does not generally apply to passenger ships on domestic voyages although, more recently[12], recommendatory measures have been adopted at the IMO[13] to improve domestic ferry safety. Therefore, it is essential to understand all the governing factors, and their relative importance, when examining possibilities to enhance domestic ferry safety in a given country.

Attitude to safety

When exploring possibilities for safety interventions in respect of domestic ferry operations, it is crucial to understand how the government adopts, implements and enforces its national laws and regulations; engages with stakeholders; invests in improvements to terminal infrastructure, and aids to navigation; provides weather and navigational warning services; facilitates radio communications; and ensures competence, training, and certification of the crew. The general public's attitude to safety, especially in the era of social media, is a strong driver for change and should be factored into the assessment of each country concerned.

1.3 Aim and objectives of the study

While there are hints of overall improvement in domestic ferry transport safety, focused efforts could bring significant gains quickly.

IMO's recently published model regulations provide an excellent template for a legislative framework to enhance domestic ferry safety. IMO's regulatory effort follows on, among other

[12] The IMO had earlier issued a set of GlobalReg standards, a comprehensive modular set of standards comprising harmonised regulations and model national legislation applicable to non-convention ships.
[13] IMO. (2021). Adoption of the Model Regulations on Domestic Ferry Safety. MSC Resolution 105/4.

initiatives, several of its Integrated Technical Cooperation Program (ITCP) activities focused on enhancing domestic ferry safety.

Asia, Africa and the Caribbean region have been a particular focus of various ITCP regional workshops, seminars, conferences, training courses, expert meetings, scoping studies and pilot projects by the IMO, in partnership with industry (IACS, Interferry) and academia (WMU), on different topics related to domestic ferry safety. Fiji (2009), Tanzania (2010), Nigeria (2019), and Saudi Arabia (2019) have hosted IMO ITCP regional workshops on domestic ferry safety with participation of countries in the region.

Individual countries have also been the focus of capacity building projects for safety improvements in the domestic ferry sector. Bangladesh was among the first countries to receive an IMO-Interferry pilot project on the safety of domestic ferries between 2004-2006. Philippines and Indonesia received scoping studies by IMO. IMO collaborated with IACS, Interferry and WMU besides the Government of the Philippines for the conduct of an international conference leading to the adoption of ferry safety guidelines under the Manila Statement (2015).

A recent example of a country specific intervention is Interferry's FerrySafe project of 2019. It was an initiative funded by Lloyd's Register Foundation, to assess domestic ferry safety in the Philippines, with a view to address global safety challenges. The Philippines study yielded an appreciation of the regulatory, financial, commercial and societal measures that had individually and collectively resulted in improved domestic ferry services.[14] The Philippines is currently receiving a Formal Safety Assessment project funded by the World Bank Group, the International Finance Corporation and IMO's ITCP for enhancing the safety and energy efficiency of its domestic passenger ships.[15]

[14] The identified improvements were: political will; insurers more involved; 'no sail' policy; enforcement of loading, lashing, and stowage; encouraging fleet renewal; phasing out of wooden vessels; ban on import of Ro-Pax ferries over 20 years; requirement for second-hand Ro-Pax imports to be classed by IACS society; tax-free import of new IACS compliant vessels; and promotion of the "nautical highway".

[15] https://www.imo.org/en/MediaCentre/Pages/WhatsNew-1663.aspx

This study by the World Maritime University for Interferry, funded by the Lloyds Register Foundation, draws its inspiration from the aforesaid initiatives and is part of various ongoing endeavours to address the problem of continuing fatalities in the domestic ferry sector.

The current study is essentially a scoping exercise on the safety of domestic ferries in seven countries: Bangladesh, Indonesia, the Philippines, the Democratic Republic of the Congo, Tanzania, Senegal, and Nigeria.

The selection of countries for the study is driven largely by the numbers of fatal accidents in these countries over the past two decades as recorded in the BMPV accident database, and presented in Section 1.2.

To achieve the aim, the study is designed in five steps as follows:

- identifying the stakeholders of the domestic ferry sector and their state of play in the safety system, for engagement in any future safety interventions;
- identifying the current hazards threatening the safety of domestic ferries and their role in the causation of unsafe occurrences, for mitigation of risk;
- examining national safety regulations related to the safety of domestic ferries, and giving consideration for alignment with IMO model regulations;
- examining the national political landscape, for identifying the state's willingness to adopt and implement a potential safety intervention; and
- a composite evaluation of the countries, for identifying the potential for an external safety intervention.

It is expected that the outputs of this project will be immensely helpful not only for the participating countries but also for inter-governmental and international non-governmental organizations focusing on improving safety standards within the domestic ferry sector.

1.4 Structure of the report

The report is structured as outlined below.

Section 1, the present section, described the background, drivers, and motivation, as well as the aims and objectives of the study.

Section 2 discusses the methodology. In particular, it describes how the various criteria in the selected countries are set, and then applied.

Sections 3-9 present the country profiles with a particular focus on the domestic ferry sector. Each country profile maps the stakeholders, identifies the relevant domestic safety regulations, and reviews accident statistics and the political landscape in the individual countries.

Section 10 explores the various indices presented in Section 2 to make an evaluation of the seven high-risk countries for domestic ferries.

Section 11 presents the conclusions and recommendations.

Annex presents the SWOT analysis to determine the potential for safety intervention investment for each of the seven high-risk countries for domestic ferries.

2 METHODOLOGY

2.1 Approach and methodology

In order to meet the aim and objectives, the project was conducted by following five main tasks as presented and explained below.

Task 1. Collection of accident and regulatory data

In task 1, the aim was to prepare the dataset of the study.

Seven countries with the highest numbers of fatalities in domestic ferry accidents were the focus of the study namely, Bangladesh, Indonesia, the Philippines, the Democratic Republic of the Congo, Tanzania, Senegal, and Nigeria.

The period of ferry accidents included in the scope of the study is broadly 2001-2021.

For accident records, the primary data sources were as follows:

- Baird Maritime Passenger Vessel (BMPV) database;
- Arcsilea database;
- Det Norske Veritas (DNV) Ferry Committee database;
- Worldwide Ferry Safety Association (WFSA) database; and
- IMO Global Integrated Shipping Information System database.

It was aimed to get as much accident data as possible into the database of the study from multiple data sources. The accident data included, name, age, type of ship, accident location (country), ship's flag, type of accident, severity of consequences, number of deaths, and injuries.

In respect of national regulations, the dataset is limited to the respective countries' legislation related to domestic ferries. IMO model regulations were obtained as the international minimum standards to consider and use for evaluation purposes.

In addition to the desktop research data collection, regulatory governance information was also collected through focus group discussions and survey questionnaire submitted to the relevant maritime authorities in the respective countries.

The datasets prepared in this task were used as input in tasks 2 and 3.

Task 2. Analysis of accident data

In task 2, the aim was to identify the hazards and contributing factors of domestic ferry accidents in the selected countries.

The accident dataset prepared in task 1 was qualitatively analysed by using the root cause analysis (RCA) method to identify the main hazards and associated underlying factors. Unlike the conventional RCA approach, which looks for the main root causes of an event, this study used cause mapping to dig further beneath the surface of the main problems. As an output, instead of finding a single root cause, the problem-solving paradigm was broadened to reveal the system of causes or hazards. A cause map provides a simple visualization and explanation of all the hazards that contribute to accidents. Consequently, the general formation pattern of accidents has been identified for each country, which was easily understandable, and quantifiable through frequency analysis.

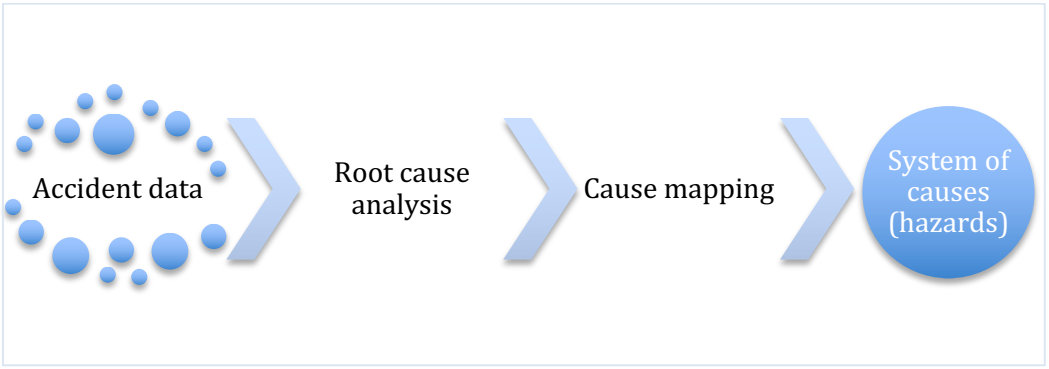


Figure 2.1. Accident data analysis process

The results of this task were fed into the evaluations and derivations in task 5.

Task 3. Analysis of regulatory data

In this task, the aim was to identify the gaps between the national safety laws and regulations related to the safety of domestic ferries and the IMO model regulations.

By examining the regulatory dataset prepared in task 1, the stakeholders of the domestic ferry sector and their state of play in the domestic ferry safety system of the proposed seven countries

were identified. The regulatory gaps between national domestic ferry safety regulations of the examined countries and IMO model regulations were also identified. The gap analysis findings fed tasks 4 and 5. The aim was to derive a better understanding of those countries' statutory resources and regulatory frameworks associated with domestic passenger shipping.

Task 4. Exploration of national political landscape

In this task, the aim was to assess the state's willingness to facilitate and receive a safety intervention and ultimately benefit from any proposed technical assistance program.

Semi-structured stakeholder interviews and focus group discussions through workshops were conducted to assess the political landscape concerning maritime safety and the safety of domestic ferries. The workshop participants were expected to have reasonable and relevant experience in the maritime administration, or its subordinate entities, and should have worked closely with the inland water transportation in their country.

The results of this task were used to determine and quantify (as a Likert scale) the state's willingness to facilitate and receive a safety intervention. The results also served as input for the final step, task 5.

Task 5. Derivation of composite evaluation matrix

In this step, the aim was to derive a composite evaluation matrix for each country.

For decision-making, the scoping study adopted the evidential reasoning approach. The evaluation was based on a robust set of attributes, indicators and indices. As for the attributes, four items were established under the main tier 1, considering the key elements in a country and the domestic ferry industry that would influence the success of any potential safety intervention. Each main attribute was further factorised into multiple sub-items that constituted the evaluation criterion and tier 2 in the evidential reasoning hierarchy.

The evaluation matrix (Likert scale) comprising the tier 1 and tier 2 attributes, indicators and indices is presented in Table 2.1.

An equal weighting factor was assigned to criteria at the same level in the evidential reasoning structure, namely 1 ÷ (total number of criteria at the same level). Thus, for example, under the unsafe occurrences level, the weight distribution of the incidence of accidents, severity of consequences, trend in the last five years, regulatory quality index and alignment with IMO model regulations was calculated as 1 ÷ 5=0.2.

Table 2.1. Evaluation matrix for an external safety intervention

Measure (Attribute/ Indicator/ Index)	
Tier 1	**Tier 2**
1. Domestic ferry industry demographics (DFID)	1.1. Size of the domestic ferry fleet
	1.2. Population depending on ferry transport
2. Unsafe occurrences and regulations (UOR)	2.1. Incidence of accidents
	2.2. Severity of consequences
	2.3. Trend in the last 5 years
	2.4. Regulatory quality index
	2.5. Alignment with IMO model regulations
3. Political gauge (POGA)	3.1. Government effectiveness index
	3.2. Corruption perception index
	3.3. Political stability index
	3.4. Ibrahim index of African governance
	3.5. Country's credibility ranking
4. Public attitude towards safety (PATS)	4.1. Passengers' willingness (material and moral) to pay for safety
	4.2. Passengers' level of safety awareness
	4.3. Public perceptions and experiences of safety and risk
5. Previous external ferry safety interventions (PEFSI)	

Description of attributes in the evaluation matrix

Domestic ferry industry demographics (DFID)

DFID covers items related to the country profile including population, geography and area, and the maritime profile of the country including the size of the ferry fleet, passengers transported, and population reliance on ferry transport. DFID attributes aim to present an overview of the country's demographics, the total audience targeted, and the magnitude of the impact, if the potential safety intervention is successful.

Unsafe occurrences and regulations (UOR)

Accidents, their consequences and severity are used in this study as indicators to understand the safety performance of a flag State and its flagged vessels. Therefore, the incidence of ferry accidents (between years 2011-2021), the severity of ferry accidents (between years 2011-2021), the trend of accident numbers in the last five years (2017-2021), the regulatory quality index of the country (one of the globally reputed indexes), and alignment with IMO Model regulations have been considered as attributes.

The values related to accidents were determined by using the ferry accident database created for the study as a result of task 1. The regulatory quality index of the country was obtained from the World Bank database for each country, for the year 2020. The regulatory quality index captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private-sector development. Finally, alignment with IMO model regulations of the countries is determined by using semi-structured stakeholder interviews and Likert-scale questionnaires.

Political gauge (POGA)

The initiation or success of a safety intervention in any country is closely related to the political willingness in that country. With the appropriate political willingness, implementation, enforcement, and raising of public awareness through governmental actions is much more easily achievable.

Since political willingness is subjective, it is rather challenging to analyse and quantify it directly. This study, therefore, draws indices from the literature used on a global scale namely, the political stability index, corruption perception index, government effectiveness index, Ibrahim Index of African Governance, and country's credit ranking.

The values of these global indices in respect of each country were obtained from publicly available data on the web page of the institution publishing the relevant index.

Public Attitude Towards Ferry Safety (PATS)

Consequent to any ferry safety intervention focused on regulatory, operational, infrastructure or human resources, implementation and enforcement are required by the relevant stakeholders. In this regard, the public attitude towards safety, safety awareness, and commitment of the public are critical to succeed with implementation and enforcement measures. The evidential reasoning structure for this study, therefore, includes public's willingness to pay for (material and moral) safety, public's level of safety awareness, and the public's perceptions and experiences of safety and risk attributes.

Since there are no indices in the literature that would directly indicate the public's willingness to pay for (material and moral) safety, or public's level of safety awareness, the values of these indices were determined by using semi-structured stakeholder interviews and Likert-scale questionnaires.

On the other hand, public perceptions and experiences of risk value of the countries were determined based on, "World Risk Poll 2021: A Changed World? Perceptions and experiences of risk in the Covid age" published by the Lloyd's Register Foundation (LRF). LRF conducted the first World Risk Poll in 2019 to provide a new global data source addressing a knowledge gap in experience with and perceptions of safety and risk. The second World Risk Poll was conducted during the height of the Covid-19 pandemic, and together, the two editions provide invaluable insight into people's changing exposure to and perceptions of risk.

Previous external ferry safety intervention (PEFSI)

PEFSI is the only attribute inversely proportional to the potential of any intervention assistance. If a country has received one or more external interventions i.e., domestic ferry safety projects, missions, or investments from governmental or non-governmental organizations or, currently has ongoing projects, that diminishes the likely effectiveness of future intervention.

The value of this attribute is determined based on information obtained through semi-structured, stakeholder interviews, administration of a Likert-scale questionnaire and supplemented by a review of the literature.

2.2 Scope and limitations of the study

The primary assumption of the study is the assigning of equal weights to the attributes in the evidential reasoning structure. In reality, for some countries, investors, and decision-makers, those attributes may require consideration with different weights. However, since this study aims to present a holistic overview by considering multiple criteria and different countries, in order to maintain equal treatment and objective assessment, equal weights were assigned to the attributes. As regards this limitation, it should be emphasised that the evidential reasoning algorithm is highly adaptive and flexible. Therefore, amending the different weights is possible dependent on the changing needs of any decision-maker.

A second limitation relates to the tier 1 attributes, “public attitude towards ferry safety” and “political gauge”. These attributes were partially assessed through questionnaires and interviews, which may cause self-reporting bias. However, in order to minimize the effect of self-reporting bias on the results, different methods (statistics, interviews, focus groups and questionnaires) were combined in the study.

3 BANGLADESH

3.1 General information and characteristics of Bangladesh

Geography

Bangladesh, officially known as the People's Republic of Bangladesh, is located in Southern Asia along the Bay of Bengal. It borders two countries, India and Myanmar. The total length of the borderline of Bangladesh is 4,711 kilometres: 3,715 kilometres with India to the west, north, and east; 280 kilometres with Myanmar to the southeast; and in the south, 716 kilometres of coastline on the Bay of Bengal. The county occupies an area of 148,560 square kilometres[16].

Figure 3.1. Bangladesh map (Source: World Atlas, 2022)

[16] Banglapedia. (2021). Bangladesh Geography. https://en.banglapedia.org/index.php?title=Bangladesh_Geography

Bangladesh's physiography consists of a flood-prone deltaic plain and a small hilly region crossed by rivers. The Bay of Bengal is known for its cyclones, which cause flooding on offshore islands' coastal plains. Bangladesh is bordered in the southwest by the vast mangrove forest known as the Sundarbans.

The rivers of Bangladesh, about 700 in number, mark both the nation's physiography and the people's life. The larger rivers are the primary water source for agriculture and the most critical commercial transportation routes. Additionally, rivers provide fish, an essential source of protein. The rivers in Bangladesh can be categorized into five major river networks: Jamuna-Brahmaputra (292 km), Padma-Ganges (2,100 km), Surma-Meghna system (669 km), Padma-Meghna (145 km), and Karnaphuli (420 km)[17] .

Bangladesh has a humid, warm climate, with an average temperature of around 26^{o}C, ranging throughout the year between 15^{o}C and 34^{o}C. The summer season (April-September) is warmer and rainy, while winter (December-February) is colder and drier.

Demographics

Bangladesh, with a population of 168 million in 2022[18], is the eighth-most populated country in the world.

The country is divided into eight administrative divisions (Bibhag), including Barisal, Chittagong, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet. The administrative divisions are further subdivided into 64 districts and several smaller subdivisions.

Dhaka, the capital and largest city, represents the administrative, cultural, commercial, and economic hub of Bangladesh. With a population of over 20 million in 2022, it is the most populous

[17] U.S. Library of Congress. (1989). Bangladesh: A Country Study. Washington: GPO for the Library of Congress. River Systems in Bangladesh. http://countrystudies.us/bangladesh/25.htm

[18] Worldometer. (2022). Bangladesh Population (Live). https://www.worldometers.info/world-population/bangladesh-population/

city in the country[19]. Chatttogram (formerly Chittagong), the second largest city, is also home to Bangladesh's largest seaport, and plays a crucial role in the country's economy.

Bangladesh is ethnically homogeneous and derives its name from the Bengali ethnolinguistic group, which makes up 98% of the population. Bengali has many dialects. Chittagong and Sylhet also have distinctive dialects[20].

Political

Bangladesh attained independence in 1971. It is a unitary, independent, and sovereign Republic. The current parliamentary system was adopted in 1991. From 1975 to 1990, the country experienced a military coup in which the army effectively retained power, but in 1991 a parliamentary system was restored.

Bangladesh's politics are conducted within the framework of a parliamentary representative democratic republic, with the President as Head of State and the Prime Minister as Head of Government. The government exercises executive authority. Both the government and parliament possess legislative power.

The judiciary comprises the Supreme Court, lower courts, and tribunals. The Bangladesh Supreme Court consists of the Appellate Division and the High Court Division. Other courts and tribunals are subordinate to it.

The Bangladeshi parliament, known as the Jatiya Sangsad (House of the Nation), is a unicameral body with approximately 350 seats, most of which are filled through direct popular elections. The remaining seats are reserved for women, all of whom are elected by the parliament. Legislators serve five-year terms. All Bangladeshi citizens over the age of 18 have the right to vote, while all Bangladeshi citizens over the age of 25 are eligible to be elected to the parliament. The President of Bangladesh is elected every five years by the legislature (Parliament). There is a limit of two

[19] World population review. (2022). Dhaka Population 2022. https://worldpopulationreview.com/world-cities/dhaka-population

[20] World Atlas. (2019). Ethnic Groups in Bangladesh. https://www.worldatlas.com/articles/ethnic-groups-in-bangladesh.html

five-year terms for the President. The President then appoints the leader of the legislative majority party (or coalition) as the Prime Minister.

Bangladesh follows the common law system[21]. However, in contrast to other common law jurisdictions, Bangladesh's Supreme Court has the authority not only to interpret laws passed by the Parliament but also to declare them null and void and to enforce citizens' fundamental rights. Despite being based on the English common law system, Bangladesh's laws take the form of statutes enacted by the legislature and interpreted by the higher courts.

The Bangladeshi Constitution was drafted in 1972[22] and has undergone numerous amendments. Also, the Muslim Personal Law (Shariat) Application Act, 1937 is still in effect in Bangladesh, providing for the application of Muslim Personal Law in all Muslim Family Affairs matters, including marriage and divorce.

Economy

Bangladesh's economy is one of the world's and South Asia's fastest-growing. The country has recorded a steady GDP growth in the last decade, picking up 7.9% in 2019[23]. In 2021, its nominal GDP was USD 416 billion[24] while the per capita GDP surpassed that of India.

Bangladesh's growth has been mainly driven by the export of manufacturing and domestic agricultural products. However, from agriculture to pharmaceuticals and shipbuilding to garments, the country is diversifying its industrial base and increasing its exports. The country's primary export sectors are textiles, shipbuilding, fish and seafood, jute, and leather goods. In addition, the country has developed its pharmaceutical, steel, and food processing industries.

[21] Islam, M. S. (2019). An Appraisal of Efficiency and Effectiveness of the Supreme Court of Bangladesh. International Journal of Management, Technology, and Social Sciences (IJMTS), ISSN, 2581-6012.

[22] An Act to make provision for the application of the Muslim Personal Law (Shariat) to Muslims. It encompasses all aspects of a Muslim's life, and although it includes civil law, criminal law, international law, and procedural law, it is only applied to family matters in Bangladesh, which is part of civil law.

[23] World Bank, (2020). https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=BD

[24] World Bank, (2022). https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=BD

The agricultural sector remains the largest employer in Bangladesh, accounting for 37.6% of the total labour force and 13.1% of the GDP. The industry employs 21.4% and contributes to 27.8% of GDP, while services account for 53.5% of GDP and use 39.8% of the total workforce[25].

Bangladesh has the second-largest financial sector in the Indian subcontinent. Dhaka and Chattogram are the principal financial centres of the country, and are home to the Dhaka Stock Exchange and the Chattogram Stock Exchange respectively.

Bangladesh is Asia's seventh largest gas producer and has substantial natural gas reserves[26]. However, gas supply meets only 58% of the country's demand[27]. Therefore, there is an increase in offshore exploration to increase gas production.

3.2 Maritime profile of Bangladesh

Shipping

Bangladesh has 9,000 square kilometres of territorial waters and 720 kilometres of coastline. Around 90% of the country's freight trade is conducted over maritime routes. Bangladesh is traditionally a shipbuilding nation and among the global leaders in ship-recycling. In 2020, the volumes of ship-building and ship-recycling were 85,349 GT and 6,995,977 GT respectively. Ports and shipyards play a significant role[28] in the national economy and trade. Around 30 million people directly or indirectly depend on the maritime sector, including commercial transportation. Currently, more than 10,000 inland and coastal ships are operating across the country, and carry more than 90% of the total oil products, 70% of cargo, and 35% of passengers. More than 150,000 people are employed in this labour-intensive sector[29]. Figure 3.2 presents select statistics about the maritime profile of Bangladesh in 2020.

[25] World Bank, 2021

[26] "Natural Gas Production by Country - World meter". www.worldometers.info.

[27] U.S. Energy Information Administration (EIA)

[28] UnctadStat. (2020). Maritime Profile: Bangladesh. https://unctadstat.unctad.org/countryprofile/maritimeprofile/en-gb/050/index.html

[29] Shemon, W. S. (2017). Problems & Prospects of Bangladesh Shipping Industry: A Comparative Overview. Bangladesh Maritime Journal (BMJ), 1(1).

Figure 3.2. Maritime profile of Bangladesh (Source: UNCTAD, 2021)

As per 2020 UNCTAD Statistics, the Bangladesh flagged fleet was estimated at 477 ships, accounting for 3.515 million DWT. According to the project survey data, as of August 2022, Bangladesh has a fleet of 83 ocean-going vessels. Ship-owning companies in Bangladesh include state-owned and private shipowners. Bangladesh Shipping Corporation (BSC) is the only state-owned public sector enterprise with 8 ships. Private entities with Bangladesh flagged vessels include KSRM Group (23 ships), Bashundhara Group (4 ships), Akij Group (11 ships), Meghna Group (31 ships), Karnaphuli Maritime (5 ships), and Orion Group (1 ship).

Inland water transportation

Bangladesh is a riverine country. A massive network of approximately 700 rivers covers about 7% of the total area of the country (Figure 3.3). Most of the rivers flow from north to south. Rivers allow easy access to any region of the country and play a vital role in the transportation of passengers and goods and, therefore, in the economy of Bangladesh. According to the Bangladesh Inland Water Transportation Authority (BIWTA), of the 5,968 km length of rivers, 3,888 km of waterways are perpetually navigable and an additional 2,150-2,500 km is navigable during the monsoon season.

Figure 3.3. Buriganga River, Dhaka, Bangladesh (Source: Britannica.com)

Bangladesh prioritizes waterway transportation to reduce its carbon footprint and road load. Water transport connects areas inaccessible by road and rail to the rest of the country. The inland water transportation system is the country's oldest mode of transportation, transporting nearly one-third of the country's passengers and goods. The private sector plays a significant role in waterway transportation, while the public sector is primarily involved only in the most remote and isolated areas.

The inland ship registry records approximately 12,500 registered vessels including around 2,000 passenger ships. In addition, there are about 750,000 country boats. The country boats play a vital role in transporting goods and people, especially the poorest, on smaller rivers which are the only means of access for rural communities. The inland waterways include all manner of vessels: ferries, steamers, launches, ships, boats, tug- boats, oil tankers, speed boats, water-bus, water ambulances, etc. (Figure 3.4).

Facilities for the embarkation and disembarkation of passengers include five modern passenger terminals, six standard facilities and over 130, basic, launch stations.

Figure 3.4. Taxi boats on the banks of the Buriganga River, Dhaka, Bangladesh (Source: Wikimedia Commons)

The Bangladesh Inland Water Transport Authority (BIWTA), and Bangladesh Inland Water Transport Corporation (BIWTC) provide pilotage facilities to the inland water vessels, regulate the movement of passenger launches and maintain the inland ports and launch ghats, including terminals. The navigable river routes are classified into four categories by BIWTA on the basis of depths available in the river, and presented in Table 3.1 and Figure 3.5.

Table 3.1. Classification of ferry routes in Bangladesh (Source: BIWTA, 2022)

Category	Depth	Routes	Total length
Class-I	3.66m - 3.96m	● Chittagong-Chowkighata-Chandpur-Shambhupura-Narayanganj/ Dhaka; ● Shambhupura-Demra; ● Shambhupura-Bhairab- Bazar/Ashuganj; and ● Chowkighata-Barisal-Mongla-Khulna-Maheswarpasha.	about 683 km
Class-II	1.83m - 3.65m	● Mohanpur-Daikhawa; ● Bhairab Bazar-Chhatak; ● Chalna-Raimongal; ● Hijla-Saistabad; ● Satnal-Daudkandi; ● Chittagong-Cox's Bazar; ● Diara-Barisal via Nandir Bazar; and ● Chandpur-Ichuli;	about 1,000 km
Class-III	0.91m - 1.82m	● Dilalpur-Fenchuganj-Zakiganj; ● Chittagong-Kaptai; ● Rangamati-Kaptai; ● Kaptai-Belaichari; ● Rangamati-Chotohorina; ● Rangamati-Mahalchari; ● Rangamati-Marisha; ● Sripur (Bhola)-Nazirpur-Char Montaz; ● Jhalakati-Barguna- Patharghata; ● Charpower-Patuakhali-Galachipa-Bara Baishdia; ● Bara Baishdia-Khepupara-Mohipur; and ● Khulna-Bardia-Manikdah.	about 1,905 km
Class-IV	> 0.91m	There are many unclassified routes. Most of these routes are seasonal routes and are used by small boats.	about 2,380 km

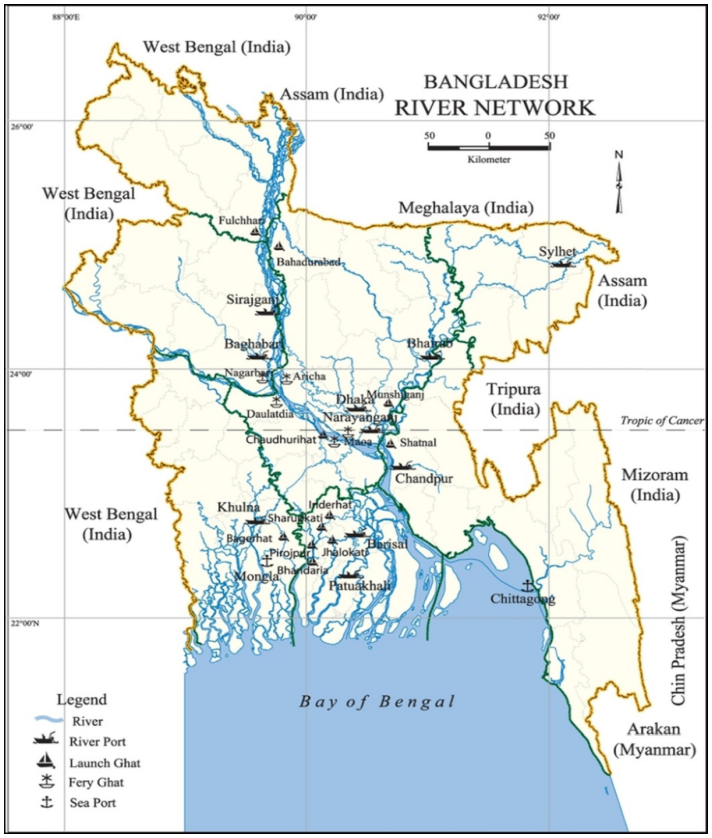


Figure 3.5. River networks in Bangladesh (Source: BIWTA, 2022)

3.3 Inland water transport regulatory framework in Bangladesh

General overview of the legal framework

Consequent to its independence, by Presidential Order No-48 of 1972, Bangladesh adopted numerous laws enacted by the former regimes that were directly or indirectly related to its maritime sovereignty.

Bangladesh entered into a bilateral agreement with India, and Myanmar, for maritime delimitation in the Bay of Bengal in 1972, and 1974, respectively.

The maritime laws of Bangladesh can be categorized into five heads[30], with the Constitution of the People's Republic of Bangladesh at the apex level followed by the statutory national laws, international laws, bilateral agreements and case laws.

[30] Hosen, M. F. (2019). An Overview of the Statutory Laws and Regulations Relating to the Maritime Issues of Bangladesh: Loopholes and Recommendations. Beijing L. Rev., 10, 1331.

The Constitution of the People's Republic of Bangladesh, adopted in 1972 has numerous articles related to the maritime issues of the State. These include Articles 1, 2, 25, 65, and 143 (2), in addition to the third Amendment of the Bangladesh Constitution[31].

At the national level, the Bangladesh Merchant Shipping Ordinance, 1983 provides the principal regulations defining the conditions of maritime transport business in Bangladesh.

The Bangladesh Flag Vessels (Protection) Ordinance, 1982 was promulgated with the primary objective of promoting and encouraging the growth of the local shipping industry. The Ordinance provides that at least 40 percent of the seaborne cargo shall be carried by national flag vessels.

The Admiralty Courts Act of 2000 deals with all matters related to Admiralty. As per the Act, the High Court Division of the Supreme Court of Bangladesh has original jurisdiction to deal with the cases of Admiralty at first instance. It extends to ships or vessels anchored at any port in Bangladesh.

The Inland Shipping Ordinance, 1976 is a vital instrument for inland shipping matters in Bangladesh. This Ordinance allows the government to ensure the survey, registration, and control of the navigation of vessels navigating the inland waters of Bangladesh.

The National Water Policy of 1999 also makes a significant mention of the issue of water transportation. According to the policy, inland water transportation substantially impacts Bangladesh's economy since it carries several products at a lower cost than other sectors. It recognises that excessive siltation in the riverbeds makes many routes unsuitable for watercraft. In elucidating this issue, the policy stipulates that maximum efforts must be made to restore navigability and dredge rivers to make inland water transportation obstacle-free.

The Bangladesh Water Act of 2013 is intended for the integrated development, management, abstraction, distribution, usage, protection, and conservation of Bangladesh's water resources. The Act also provides for international exchange and regional cooperation in sharing of information and data in respect of shared water resources, research on international rivers,

[31] *op. cit.* 28.

chemical and organic pollution prevention, developing water resources, and sharing of knowledge through education and training programs.

Some of the notable acts and policies applicable to inland water transport in Bangladesh are presented in Table 3.2.

Table 3.2. Select list of laws and policies for inland water transportation in Bangladesh

- National Water Policy, 1999
- Bangladesh Water Act, 2013
- National River Protection Commission Act, 2013
- The Inland Water Transport Authority Ordinance, 1958
- The Inland Shipping Ordinance, 1976
- Inland Shipping (Amendment) Act, 1990
- Presidential Order No. 28 of 1972, Ordinance for BIWTC
- Pilotage Ordinance, 1969
- Mongla Port Authority Ordinance, 1976
- Payra Port Authority Act, 2013
- Payra Port Project (Land Acquisition) Act, 2016
- Bangladesh Inland Water Transport Corporation Order, 1972
- The Bangladesh Merchant Shipping Ordinance, 1983
- Fisheries (Protection) Ordinance, 1959
- Local Government (Union Parishad) Ordinance, 1983
- Water Resources Planning Act,1992
- Interference with Aids to Navigation Ordinance, 1962
- National River Protection Commission Act, 2013
- Bangladesh Inland Water Transport Corporation Order, 1972
- Bangladesh Flag Vessels (Protection) Ordinance, 1982
- Water Resources Planning Act, 1992
- Bangladesh Preservation of Environment Act, 1995
- Bangladesh Shipping Corporation Act, 2017
- Admiralty Court Act, 2000
- The Foreign Voluntary Organizations (Acquisition of Immovable Property) Regulation Ordinance, 1983

Institutional Framework

In Bangladesh, the Ministry of Shipping (MoS) is the primary regulator of the maritime sector, including inland water transport. MoS involves within its fold, the shipping and port sectors, including national waterways, inland water transport, ports, and ocean shipping, addressing safety and environmental issues and regulatory aspects of maritime shipping and maritime education. The ministry's primary responsibilities include policy formulation and project implementation. It is also responsible for expanding and maintaining a viable, efficient, dependable water transportation and communication system.

Under the MoS, several institutions manage inland waterways, among others, the Department of Shipping (DoS), Bangladesh Shipping Corporation (BSC), Bangladesh Inland Water Transport Authority (BIWTA), Bangladesh Inland Water Transport Corporation (BIWTC), and the National River Conservation Commission (NRCC). These institutions work for the modernization of sea, river, and inland ports, conservation of waterway navigation, development of competent human resources for the maritime sector, safe and economical transportation of passengers and goods, and expansion of international trade via waterways. In particular, BIWTA and BIWTC are the two leading government players that keep the inland waterways navigable and safe for the smooth transportation of cargo and passengers.

The Department of Shipping

The Department of Shipping (DoS), an agency under Bangladesh's Ministry of Shipping, is the maritime safety administration of Bangladesh. DoS is responsible for developing and implementing national policies and laws. In addition to ensuring the safety of life and vessels at sea, DoS oversees the development of the shipping industry, maritime education and certification, employment and welfare of seafarers, and other shipping-related matters. Furthermore, compliance with maritime-related international conventions is tasked to the agency. DoS, in carrying out its duties, is mainly responsible for the following:

- administering Merchant Shipping Ordinance, 1983 and Inland Shipping Ordinance, 1976;
- administering the national and international standards of shipping to the inland and seagoing ships through survey and inspection;

- administering the standards for seafarers by conducting examinations and certification for various grades of examination for inland and international shipping;
- monitoring conditions of the vessels after survey and taking appropriate steps to check any unlawful practices and ensure safe operation of watercraft; and
- administering Bangladesh Flag Vessels (Protection) Ordinance, 1982 and rules thereunder.

Bangladesh Inland Water Transport Authority

The Bangladesh Inland Water Transport Authority (BIWTA) was established through the promulgation of Ordinance No. LXXV of 1958 (amended later by Ordinance of 1977). BIWTA is the authority in Bangladesh responsible for formulating policies. Subject to the permission and approval of the government, the Authority shall have the power to enforce rules and regulations or any laws about inland waterways and traffic control thereon, in whole or in part. As per the establishment text, BIWTA is tasked to carry out the following statutory development, maintenance, and regulatory functions:

- perform river conservation operations, including river training operations for navigational purposes and the installation of aids to navigation, such as marks, buoys, lights, and semaphore signals;
- disseminate navigational and meteorological information, including river chart publication;
- offer pilotage and hydrographic survey services;
- develop dredging requirements and priorities for efficient maintenance of existing navigable waterways, resuscitation of dead or dying rivers, channels, or canals, and development of new channels and canals for navigation;
- on behalf of the government, fix maximum and minimum fares and freight rates for inland water transportation;
- approve timetables for passenger launch services; and
- act as the Competent Authority of Bangladesh for the Protocol on Inland Water Transit and Trade, supervising the use of Bangladeshi waterways on behalf of the Government of Bangladesh for trade and transit between Bangladesh and India, as stipulated by the Protocol.

Three other institutions assist the aforesaid authorities and are involved in inland water transport management and development in Bangladesh.

National River Conservation Commission

The National River Conservation Commission (NRCC) was established by the National River Conservation Commission Law, 2013 to mainly develop the navigational facilities necessary to ensure the multipurpose use of rivers for socioeconomic development. Other objectives of the Commission include protecting the rivers from illegal use, pollution of water and environment, illegal infrastructure construction, preventing inconveniences or irregularities and restoring the flow of the rivers. The draft 'National River Conservation Commission Act, 2020' seeks to ensure the independence of NRCC and incorporates stringent provisions for offences regarding rivers and other water sources.

Bangladesh Shipping Corporation

The Bangladesh Shipping Corporation is the largest ship owner in Bangladesh. It was established in 1972 as a state-owned and managed public sector corporation. Providing efficient, safe, dependable, and affordable shipping services to local exporters, importers, and businesses and developing sustainable shipping and ancillary infrastructures are identified as the corporation's core responsibilities.

Bangladesh Inland Water Transport Corporation

The Bangladesh Inland Water Transport Corporation (BIWTC) was established by an Order in 1972 to provide safe and efficient shipping and water transport services on coastal and inland water routes. It can engage in all activities connected with or ancillary to such water transport services.

Other stakeholder institutions with a substantial role in inland water transport development in Bangladesh include the Land Port Authority, Chittagong Port Authority, Mongla Port Authority, Payra Port Authority, Bangladesh National Maritime Institute, Bangladesh Marine Academy, etc.

3.4 Domestic ferry accidents in Bangladesh[32]

Trends in accidents

As per the study database, 46 fatal accidents occurred in domestic ferries in Bangladesh waters between 2011 and 2021 with the annual number of fatal accidents indicating a slightly decreasing trend (Figure 3.6). Interview participants from BIWTA attributed the decrease to both, government initiatives and the positive impact of technical assistance projects, especially in the last five years although, the high siltation rate in rivers with a resultant decrease in navigable waters is a critical issue that needs to be addressed to prevent the occurrence of inland water transport accidents. In particular, the government of Bangladesh is recruiting more staff, procuring new dredgers, etc. to make inland water transport safer besides ongoing World Bank-supported projects related to dredging, route maintenance, and development of port infrastructure. This can be considered a positive indicator, suggesting that a future safety intervention may be more successful with the positive efforts of the authorities.

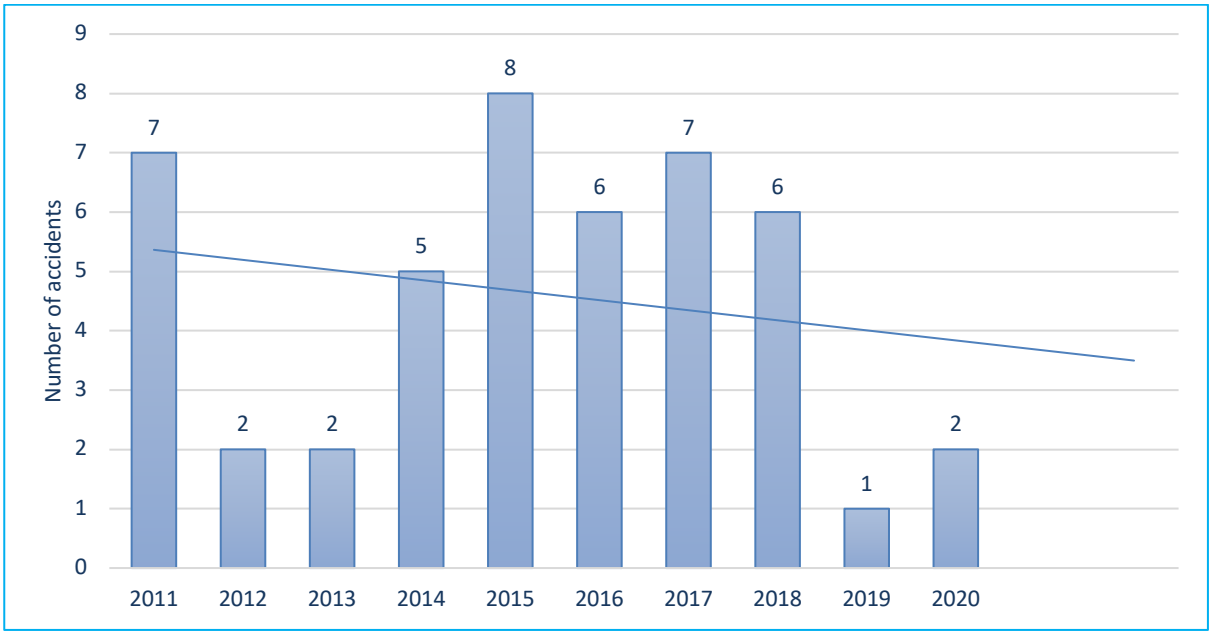


Figure 3.6. Trend of fatal accidents in Bangladesh: 2011-2021 (Source: Arcsilea)

[32] The statistics in this section of the report is drawn from the Arcsilea database.

Causal factors of accidents

During the last decade, in total, 1,577 people lost their lives as a result of domestic ferry accidents in Bangladesh. The study revealed that capsizing and collision followed by sinking represented 81% of the total casualties (Figure 3.7) and contributed to 90% of the total number of lives lost. The causes of accidents frequently cited in the literature, and the accident database of this study include: overloading, allision with wrecks, capsizing due to instability, poor lookout, heavy siltation in rivers (poor route maintenance), unseaworthy vessel (heavy weather and sea conditions), wrong manoeuvre, lacking in lifesaving appliances, and hull failure [33, 34, 35]. Interview discussions suggested that poor structural characteristics of the vessels used for passenger transport in inland waters lead to severe consequences in the event of any incident of contact, allision, collision, fire, hull damage, etc. As a part of the organizational learning culture from past accidents, accident reporting was also discussed, and the participants stated that accident reporting is much more diligent as compared to the past. On the other hand, it emerged that the reports are in the national language and not publicly available.

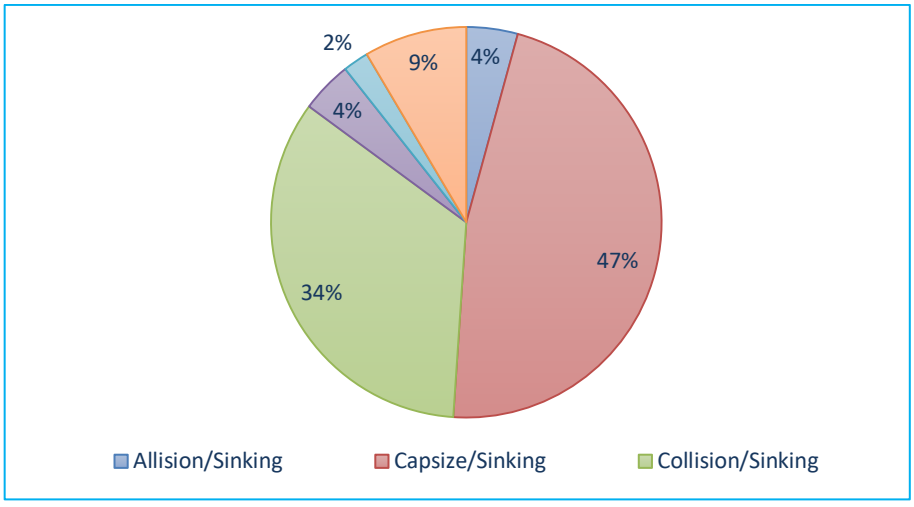


Figure 3.7. Percentage distribution of accidents in Bangladesh: 2011-2021 (Source: Arcsilea)

[33] Iqbal, K. S., Hasegawa, K., Bulian, G., Karim, M. M., & Awal, Z. I. (2007). Passenger ferry accidents in Bangladesh: Design and socio-economic aspects. In Proceedings of the 10th International Symposium on Practical Design of Ships and Other Floating Structures (PRADS 2007) (Vol. 30).

[34] Rahman, S. (2017). An analysis of passenger vessel accidents in Bangladesh. Procedia engineering, 194, 284-290.

[35] Uddin, M. I., & Awal, Z. I. (2020). Systems-theoretic approach to safety of inland passenger ship operation in Bangladesh. Safety science, 126, 104629. https://www.sciencedirect.com/science/article/pii/S0925753520300266

Geographic distribution of waterways accidents

The study revealed that the river routes are highly prone to accidents rather than close coastal routes, channels and archipelagic area routes. In the examined accident dataset, the river routes accounted for 85% of the fatal accidents in the last decade (Figure 3.8). Three rivers with the highest number of accidents were the Meghna River (19%; the widest river), Padma River (11%; the second longest river with rough seasonal waves and high current), and Buriganga River (11%; a tide-influenced river). The percentage distribution of accidents across the rivers in Bangladesh is presented in Figure 3.8, and a more detailed overview of the geographic distribution is provided in Table 3.3.

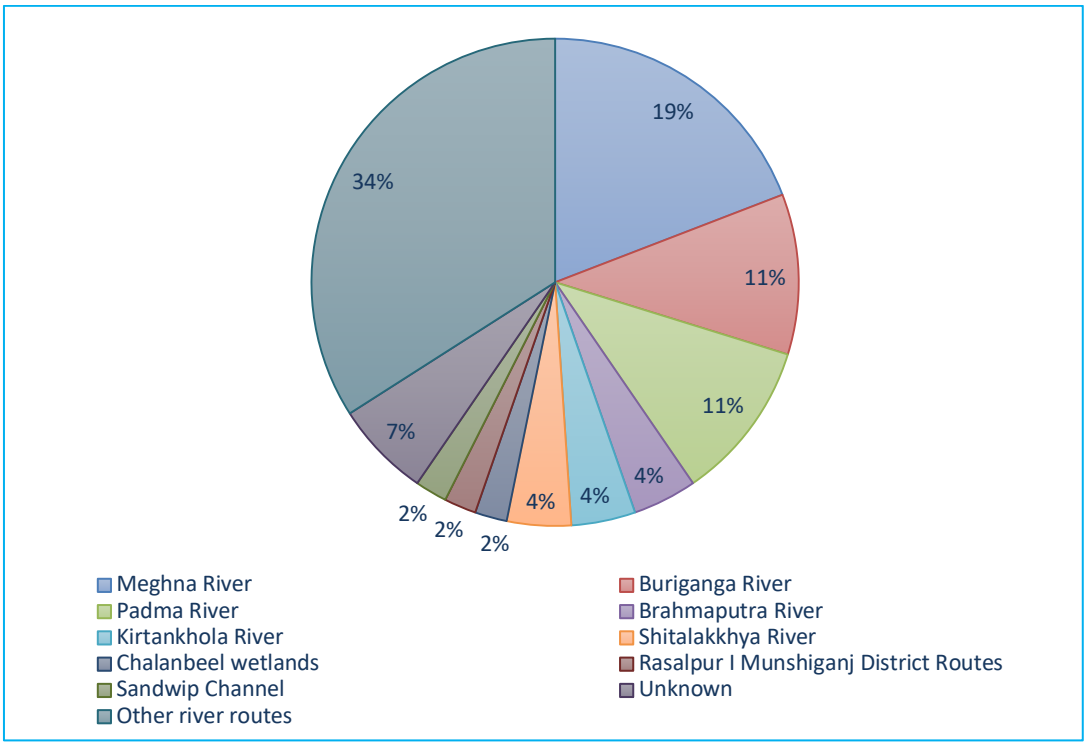


Figure 3.8. Percentage distribution of accidents in Bangladesh by location: 2011-2021 (Source: Arcsilea)

Concluding remarks about accidents in Bangladesh

Bangladesh is a highly populated country and the available transport, including waterways transports, is constantly in short supply. Both passenger and cargo transportation over inland waterways are dominated by the private sector. Riverine transportation services are popular throughout the nation and are utilized by all socioeconomic classes. It appears from accident analysis in Bangladesh that riverine transportation records more accidents than the ocean sector.

Collision, overloading, inclement weather, fire and explosion, and damage to the vessel's hull have been regarded as the main causes of accidents in riverine transportation in Bangladesh.

Table 3.3. Geographic distribution of waterways accidents in Bangladesh

Location	Accident prone area
Meghna River	Dhaka-Chandpur Route Near Narsingdi Near Manpura Near Raipura Near Soargaon Near Bramanbharia Near Sreepura
Buriganga River	Near Dhaka Near Narayanganj Near Sadarghat
Padma River	Western Bangladesh Near Kushtia Munshiganj district Near Talaimary
Other river routes	Brahmaputra River Kirtankhola River Shitalakkhya River Aria Kha River Jaducata River Jamuna River Kaliokatha Haor River Khowai River Magra River Pagla River Paira River Panguchi River Ramnabad River Rangamati River River Kumar Sandhaya River Sugandha River Surma River

The study revealed that many of the vessels that navigate the rivers lack fitness certification and sailing permits. Many of the operators of passenger vessels are unlicensed, indicating that they lack the necessary competence and skills. During the monsoon, the width of the waterways expands to a few kilometres, but the navigable channels remain narrow, shallow, and winding, threatening the navigation through them. Most of the passenger riverine transportation vessels do not follow shipbuilding structural rules including fire protection and control plans. The provision of life-saving appliances is usually inadequate in the vessels and means of escape are not clearly defined. Making matters worse, in their pursuit of maximum profit, the owners of passenger vessels tend to overload their vessels two to three times their actual carrying capacity, resulting in instability. Weather is also one of the principal causes of inland transport accidents in Bangladesh. From June to October, the Bay of Bengal often experiences extremely turbulent weather. At this time of the year, cyclones, gusty winds, and heavy rainfall are typical occurrences.

To sum up, the contributing factors leading to inland water transportation accidents in Bangladesh can be summarized as follows: overloading; bad weather; human error, including lack of competence and skill, wrong manoeuvring, lack of awareness of the crews; poor management of river route and inland port; lack of passenger awareness; lack of navigability and absence of navigational aids; unauthorized ship building and improper survey; plying without survey and registration certificate; owner ignorance and negligence in vessel maintenance.

4 DEMOCRATIC REPUBLIC OF THE CONGO

4.1 General information and characteristics

Geography

The Democratic Republic of the Congo (DRC) is located in Central Africa, covering an area of 2,345,409 square kilometres. It is the second largest country in Africa, after Algeria. Nine countries border the DRC: The Republic of the Congo, the Central African Republic, South Sudan, Burundi, Rwanda, Uganda, Tanzania, Zambia, and Angola. DRC also has a coastline on the Atlantic Ocean to the west.

Most of the country's central and western regions are a part of the Congo River basin. With a length of 4,398 kilometres, the Congo River is the second longest river in Africa. Numerous lakes, including Albert, Edward, Kivu, Mweru, and Tanganyika lie along the country's eastern border.

Figure 4.1. Map of the Democratic Republic of Congo (Source: World Atlas, 2022)

Demographics

DRC is divided into 26 provinces, with a total population of around 92 million in 2021[36]. The capital Kinshasa is located in the west along the Congo River. With 199,567 square kilometres, Tshpo is the largest province by area, while Kinshasa is the most populous one, with a population of around 8 million. At 3.19%, the Democratic Republic of the Congo has one of the fastest population growth rates in the world[37].

Over 200 distinct ethnic groups exist in the DRC, of which the majority are Bantu. The four major ethnic groups in the DRC are Mongo, Luba, Kongo (all Bantu), and the Mangbetu-Azande (Hamitic). The combination of these four groups makes up around 45% of the total DRC's population. Within these groups, about 700 native languages and dialects are spoken in the DRC, but the linguistic diversity is bridged by French, which is the official language of the country, and the intermediary languages are Kikongo ya leta, Tshiluba, Swahili, and Lingala[38].

Political

DRC attained independence in 1960. DRC is a unitary, multiparty republic country with two legislative houses - the Senate with 108 members and the National Assembly with 500 members. According to the Constitution, the President is the Chief of State and is elected for a maximum of two five-year terms. The Prime Minister is the head of government and is formally appointed by the President. The country is led by a semi-presidential, strongly decentralized State. The executive at the central level is divided between the President and the Prime Minister. With 26 Justices, the Supreme Court is the highest judicial organ in the country, while the country also has a Constitutional Court with nine judges[39].

As for the legal framework, the DRC is a civil law country. The main provisions of its private law are traced back to the 1804 Napoleonic Civil Code. More specifically, the Congolese legal system

[36] World Bank, 2021. Population of Democratic republic of Congo.

[37] World Population Review. DRC population 2022.

[38] Open Doors International/World Watch Research, January 2022. Democratic Republic of the Congo: Full Country Dossier. file:///C:/Users/INFO/Downloads/Full-Country-Dossier-DRC-2022%20(1).pdf.

[39] Open Doors International/World Watch Research, January 2022. Democratic Republic of the Congo: Full Country Dossier. file:///C:/Users/INFO/Downloads/Full-Country-Dossier-DRC-2022%20(1).pdf.

is primarily based on Belgian law; as a result, the general characteristics of the DRC legal system are similar to those of the Belgian legal system. Customary law or tribal law is another basis of the legal system of the DRC. Local customary laws regulate both personal status laws and property rights, particularly in the various traditional communities of the country. Although the DRC's Constitution subordinates the customary laws to State laws, customary laws settle 75% of disputes in the country. International treaties and agreements are the second source of law. By virtue of article 215 of the Constitution, treaties and international agreements that the DRC duly concludes must prevail over Congolese legislation, upon publication in the government gazette, Journal Officiel. Legislation is a third source of law, where the DRC's Constitution distinguishes between organic laws and ordinary laws. Unlike ordinary laws (lois ordinaires), organic laws (lois organiques) are a special kind of legislation that organize key areas of national life and require an absolute majority to be passed and amended[40].

DRC is endowed with an abundance of natural resources. However, besides a host of historical factors, weak public sector institutions, high rate of internal migration, food insecurity, and constant armed conflicts are among the many challenges facing the country. Nevertheless, the country has witnessed the first peaceful handover of government following the 2018 elections after 60 years of independence, and the current government is pursuing an ambitious reform agenda aimed at restoring peace and fostering economic development. The international community is supporting governmental efforts with a close political dialogue and technical monitoring[41].

Economy

The DRC's economy is largely dependent on the commodity market, particularly copper, cobalt, tin, tungsten, and tantalum. Indeed, DRC's rich natural resources, large population, and strategic location in Central Africa make it a potentially rewarding market for international companies.

[40] Dunia P. Zongwe, François Butedi and Phebe Mavungu. Overview of the Legal System of the Democratic Republic of the Congo (DRC) and Research.Clément. https://www.nyulawglobal.org/globalex/Democratic_Republic_Congo1.html

[41] Federal Ministry for Economic Cooperation and Development. (2022). DEMOCRATIC REPUBLIC OF THE CONGO: A country in deep crisis. https://www.bmz.de/en/countries/democratic-republic-of-the-congo

However, persistent conflict in the region, weak institutions, and low political willingness undermine the DRC's commercial and investment climate and make it rather challenging.

DRC is among the five poorest nations in the world. In 2018, about 73% of Congolese or about 60 million people lived on less than USD 1.90 a day[42]. More than 20% of the population is dependent on humanitarian assistance[43].

4.2 Maritime and inland water transport profile

Maritime and inland Waterways in DRC

DRC, with only 40 kilometres of coastline on the Atlantic Ocean, is almost a landlocked country. However, the country has more inland waterways than any other continent in Africa[44]. The navigation network of inland waterways of DRC is estimated at 17,000 km according to the database of the International Commission of the Congo-Oubangui-Sangha Basin (CICOS), and is based on the Congo River and its tributaries, creating one of the main transportation routes in Central Africa. Other data, according to CICOS, mention 25,000 km, including lake waterways.

Congo River

Lake Kivu

(Source : https://www.cicos.int/wp-content/uploads/voies-navigables)

The Congo River, formerly also known as the Zaire River, is the second longest river in Africa, behind the Nile, with 4,700 km long. As the river flows, its width varies between 5.75 km to 11.3 km. The river flows through seven countries, including the Republic of the Congo, the Central

[42] World Bank. (2022). Republic Democratic of Congo: Overview.

[43] Global Network Against Food Crises. (2022). Global Report on Food Crises: Joint Analysis for better Decisions. https://www.fao.org/3/cb9997en/cb9997en.pdf

[44] Encyclopaedia Britannica. Congo River, Africa. https://www.britannica.com/place/Congo-River.

African Republic, Zambia, DRC, Angola, Cameroon, and Tanzania. The Congo River is divided by two series of falls into three sections with distinct characteristics:

- *the Lower Congo River*, with many gorges and waterfalls: It runs from the mouth of the Congo River to Matadi (148 km). It also includes the main tributaries: Kwilu (200 km), Inkisi (640 km), and Djoué (175 km);
- *the Middle Congo River*, with a steady stream: It runs from Kinshasa to the Boyoma Falls. With a length of approximately 14,000 km, it includes, Kwa-Kassai (2,153 km), Fimi (1,070 km), Lukenie (900 km), Kwango (1,702 km), Sankuru (1,280 km), Sangha (1,395 km), Ubangi (2,299 km), Aruwimi (1,287 km), etc.
- *the Upper Congo River*, with many tributaries and rapids: It runs over 3,300 km. It includes the Lualaba River and its tributaries, 2,000 km and the great lakes, 1,300 km.

Furthermore, the three main navigable rivers in the Congo River basin (see Figure 4.2) are as follows:

- the river Congo from Kisangani in the east of DRC to Kinshasa and Brazzaville;
- the Oubangui river, which is the main tributary to the Congo River, navigable from the town of Bangui in the northwest of DRC to its confluence with the main river west of the town of Mbandaka; and
- the Kasaï river, which is navigable from the town of Ilebo to its confluence with the Congo River northeast of Kinshasa/Brazzaville.

Apart from the river network, the importance of the lakes network in the inland waterways of the DRC should also be noted. This includes Lake Tanganyika, covering 1,425 km^2 that links the DRC to Zambia, Tanzania and Burundi. Then there is Lake Kivu, one of the great lakes of Africa. It is located between DRC and Rwanda, and covers a total area of 2,700 km^2. Other lakes include Lake Mai Ndombe in Bandundu, with its large town of Inongo, Lake Moero between DRC and Zambia, and lakes Mobutu and Idi Amin between the DRC and Uganda.

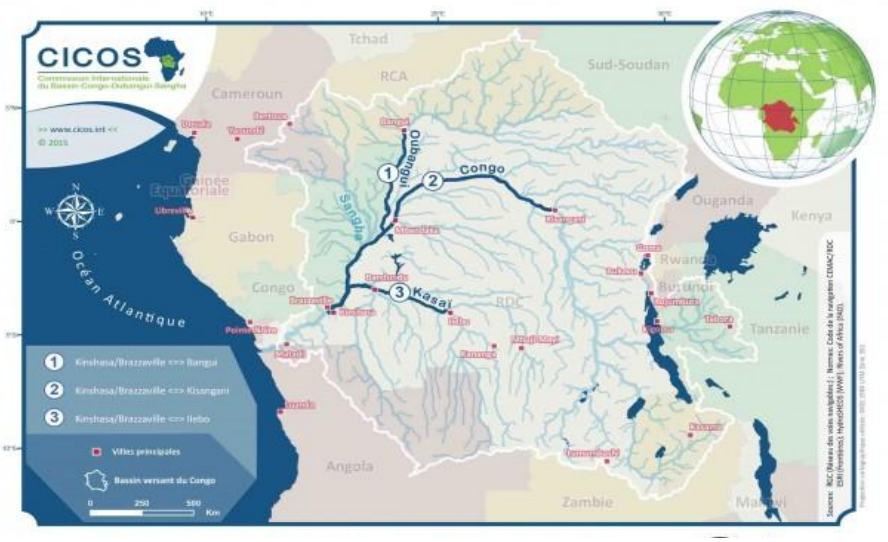


Figure 4.2. The three main navigable rivers in the Congo river basin (Source: CICOS)[45]

Classification of inland waterways in DRC

The inland waterways, including the river and lake routes in the DRC, fall under four categories (see Figure 4.3), with respective responsible authorities.

- *Category 1*. It includes routes that offer navigation depths of more than 2 m in high water and 1.3 m in low water. These are accessible by barges of more than 800 tons, with the possibility of forming convoys of about 10,000 tons.
- *Category 2*. It includes routes that offer navigation depths of 1.3 m in high water and 1 m in low water. These are accessible by barges of 200 to 800 tons, with the possibility of forming convoys of about 5,000 tons.
- *Category 3*. It includes routes that offer navigation depths of 1 m in high water and 0.5 m in low water. These are accessible to barges of 50 to 450 tons, with the possibility of forming pushed convoys of about 800 tons.
- *Category 4*. This is about 10,000 km of waterways, classified as agricultural service routes. It includes routes that offer navigation depths of less than 0.7 m in high water and 0.2 m in low water. These are accessible to wooden boats, and barges of 40 to 50 tons, with the possibility of forming convoys of about 200 tons.

[45] https://www.cicos.int/navigation-interieure/voies-navigables/

Responsibility for the development and maintenance of waterways lies respectively with the Congolaise des Voies Maritimes – CVM for the maritime reach (Lower Congo) and the Régie des Voies Fluviales- RVF for the Middle and Upper Congo. The RVF and CVM are responsible for the maintenance and development of waterways of Category 1, 2 & 3, in the respective reaches. Category 4 waterways, however, are under the responsibility of the Directorate of Agricultural Service Routes (la Direction des Voies de Desserte Agricole- DVDA).

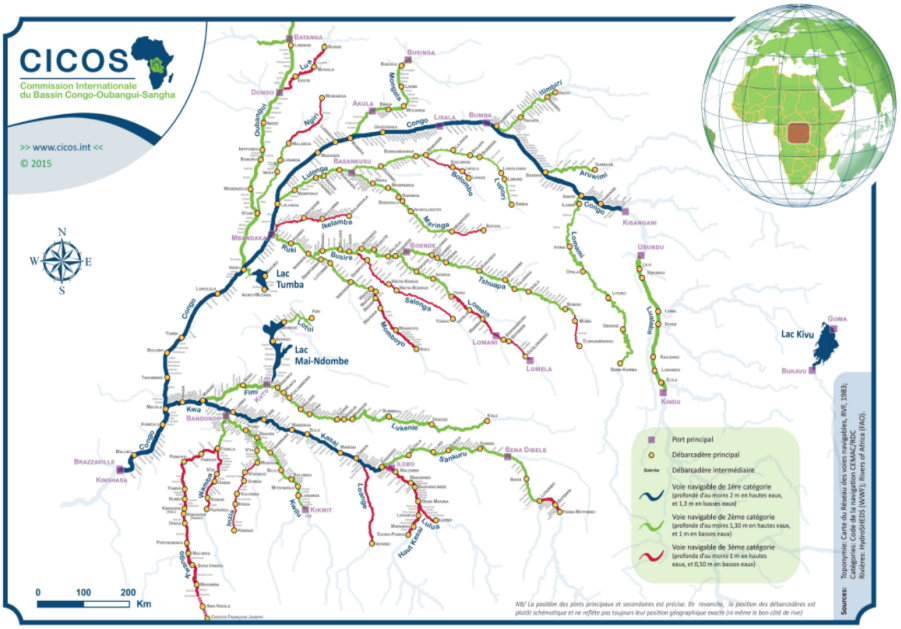


Figure 4.3. Categories of navigable waterways in DRC (Source: CICOS, 2015)[46]

Waterways transport in DRC

The waterways along the coast of the Atlantic Ocean, rivers and lakes have been for a long time an important means of transport of goods and people.

Figure 4.4. Ships used on the Congo River dating back to 1880-1890 (Source: Wikipedia, 2020)[47]

[46] https://www.cicos.int/navigation-interieure/voies-navigables/

[47] https://nl.wikipedia.org/wiki/Lijst_van_stoomboten_gebruikt_voor_de_verkenning_van_Congo

Currently, three maritime ports along the rather short Atlantic Ocean coastline facilitate DRCs international trade – Matadi, Boma, and Banana. Matadi is the most important of these three ports.

The significant lack of road infrastructure in DRC makes inland water transport through rivers and lakes extremely important for transporting goods and passengers. River routes are particularly important in the DRC's interior provinces, where the population is mainly concentrated along the rivers, and where, waterways are often the only service. The DRC's network of inland waterways includes 40 main river ports, and more than 200 secondary ports (boat docking points), particularly on the Congo River and its rivers. Along with its tributaries, the Congo River is accessible to boats and barges across almost all the provinces of the DRC. In particular, the middle Congo has denser traffic than the other provinces. It serves as an interchange route for the entire central Congo basin and connects the city province of Kinshasa to the provinces of Bandundu, Kasai Occidental, Kasai Oriental, Equateur and Province Orientale, as well as neighbouring countries such as Cameroon, the Republic of Congo and the Central African Republic.

Inland waterways in DRC play a major economic and social role and allow the country to connect the villages with both coastal areas and the neighbouring country.

Passenger ferry transport in inland waterways

In DRC, more passengers and goods are transported through inland water transport by boat and ferry than in any other country in Africa. Kinshasa, the capital of DRC, with 7 km of river facade occupied by wharfs and jetties, is the largest inland waterways port in Africa. The Kinshasa-Kisangani route on the Congo River is the longest (1,000 km) and best-known in the continent.

Figure 4.5. Congo: A river journey [48]

[48] https://www.bbc.co.uk/news/resources/idt-sh/congo. https://www.cicos.int/category/navigation-interieure/

Figure 4.6. Balénières at the beach in Kinshasa [49]

The extensive inland waterways allow links between many provinces within the country as well as to cities in neighbouring countries. The middle Congo River and its tributaries are hosts to the principal domestic waterways in the DRC. Lake waterways are also of prime importance in domestic transportation in DRC. The main international links via inland waterways, principal river routes and main domestic river and lake waterways in the DRC are at Table 4.1.

Table 4.1. Principal inland waterway transport systems in the DRC

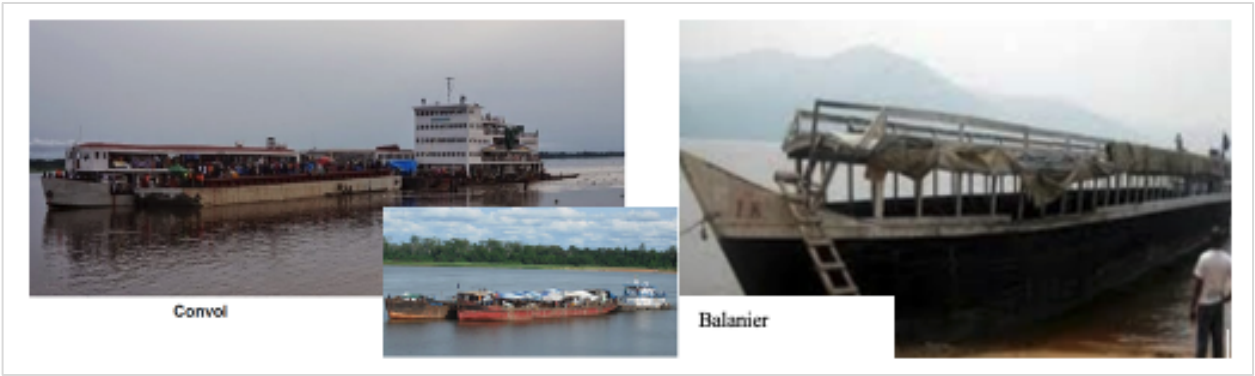
Waterway	Description	Route
International	Congo River	Kinshasa to Brazzaville in Republic of the Congo across the River
	Ubangui River	Kinshasa to Bangui in Central African Republic
	Lake Kivu	Goma and Bukavu to Gisenyi, Kibuye, and Cyangugu in Rwanda
	Lake Tanganyika	Kalemie, Kulundu-Uvira, and Moba to Kigoma in Tanzania, Bujumbura in Burundi, and Mpulungu in Zambia
	Luapula R. - Lake Mweru system	Kasenga, Pweto to Nchelenge, Kashikishi, and Kashiba in Zambia
River system	River Congo	Kinshasa to Mbandaka and Kisangani
	Kasai River	Kinshasa to Ilebo
Lake waterways	Lake Tanganyika	Kalemie to Kalundu-Uvira
	Lake Kivu	Bukavu to Goma
	Lake Mai - Ndombe	Fimi River to Inongo
	Congo R. - Lake Tumba system	Irebu on the Congo to Bikoro
	Luapula R. -Lake Mweru system	Kasenga to Pweto
	Lake Albert	Kisenye to Mahadi-Port

[49] https://www.radiookapi.net/actualite/2012/09/02/kinshasa-20-ports-beachs-interdits-de-fonctionner

Most waterway routes in the Congo River do not usually operate on regular schedules. Most large Congo River ferry boats were destroyed during the civil war. Only smaller boats are running and the services are irregular. The largest part of DRC's river transportation services is provided by small, informal, private operators for which activity statistics do not exist. In addition to the numerous wooden canoes, the transport via rivers is operated by tugs pushing several barges lashed together, like small floating towns, carrying hundreds of passengers and traders to their destination. Usually, the river boats are considerably smaller and less seaworthy than those navigating the lakes. Regarding their fabrication, apart from the small canoes and barges, very few boats have been built in-country. A few, relatively modern fast ferries called 'Cannot Rapides' built in Europe, operate on the Congo River near the capital, Kinshasa. However, their fares are reported to be very expensive. The lake ferries tend to be larger and are mostly built in Europe. But they are poorly maintained and mostly incompetently operated.

Inland water transport fleet

According to data from CICOS and DMVN, the size of the registered fleet of DRC on the Congo River and its tributaries is estimated at roughly 18,650 vessels, shared between Upper Congo (7,000 units/6 registers), Middle Congo (11,150 units/10 registers) and Lower Congo (500 units/1 register). However, the total operational fleet in inland waterways was estimated at around 4,400 units. This is besides an unknown number of smaller boats and crafts propelled by outboard motors or even paddles. Table 4.2 presents the DRC fleet operated on the Congo River, according to the last updated statistic in 2014 by CICOS.



(Source: https://transportafrica.org/maritime/)

Table 4.2. DRC fleet operated on the Congo River (Source: CICOS, 2014)

Vessel type *(French nomenclature)*	**Number**
Baleniere	3600
Barge	2217
Canot	705
Pousseur	364
Ponton	297
Bac	118
Remorqueur	126
Chaland	61
Vedette	50
Other	3450
Total	**10988**

4.3 Governance of maritime inland water transport

Institutional regulatory framework of maritime and inland water transport

The DRC's maritime and inland water transport sector is regulated by the Directorate of Maritime Affairs and Waterways (*French: La Direction de la Marine et des Voies Navigables- DMVN*)[50]. The DMVN is under the Ministry of Transport and Communication (MTVC). The Directorate has the mission of ensuring the inspection of navigation, surveillance and river police, by establishing and controlling regulatory standards for maritime and inland waterway transport activities, in particular by monitoring port infrastructure, shipyards and waterways; monitoring and securing floating units; and certification and supervision of seafarers. In this respect, the DMVN issues administrative documents, including tonnage certificates; registration certificates; certificates of seaworthiness; sailing permits and certificates of competence; certificates of extracts from registers, and certificates of cancellation.

[50] The DMVN is Operated by around 100 employees.

The Ministry of Transport and Communication is represented at the provincial level by the Maritime, River and Lake Commissariats (*French: Commissariats Maritimes, fluviaux et lacustres*)[51]. However, the said commissariats are technically and administratively dependent on the provincial governments. While the function of navigation inspection, surveillance and river police is assigned to DMVN, the implementation of navigation inspection is carried out by the Maritime, River and Lake Commissariats. Among other tasks, the Commissariats:

- implement the safety standards of the vessels established by national and international regulations;
- ensure the technical inspections of the vessels;
- issue provisional certificate of seaworthiness;
- monitor the activities of maritime experts;
- issue exit permits certifying the seaworthiness of vessels for the voyages for which they are intended and authorize their departure from ports;
- control and verify the qualification of seafarers;
- enlist crews;
- inspect vessel logbooks and keep a copy thereof; and
- receive voyage reports.

The Ministry of Transport has under its supervision several autonomous bodies and institutions responsible for the development and maintenance of waterways, as described below.

The River Waterways Authority (*Régie des Voies Fluviales- RVF*) is a public agency under the supervision of the Ministry of Transport and Communication. It is responsible for the development and maintenance of the waterways of the middle and upper reaches of the Congo River, including tasks regarding bathymetry, hydrography and cartography. It is also responsible for dredging and mapping river routes for the upper section of the Congo River and its tributaries, from Kinshasa to Kisangani as well as to Ilebo.

[51] The commissariats employ a staff around 500, including administrative staff and officers at the various checkpoints in 11 provinces of the DRC.

The Congolese Maritime Routes Authority (*la Congolaise des Voies Maritime - CVM*) is a commercial company in which the State is the sole shareholder. The CVM is responsible for developing and maintaining the maritime reach i.e., the lower reach of the Congo River.

The National Office of Transport (*Office National des Transports - ONATRA*), currently called "Commercial Company for Transports and Ports (Société Commerciale des Transports et des Ports- SCTP)", was established by Decree No. 0051 of November 7, 1995 under the Ministry of Transport and Communication. The ONATRA was also granted the status of a public company responsible for managing the transport sector. In addition to road and rail transport, the ONATRA plays a key role in maritime transport, including maintenance, management and operation of port facilities and cargo handling. It also plays a key role in river transport, including the management of port facilities and river transport services on all rivers and lakes.

The High Council of River and Lake Navigation (*Le Conseil Supérieur de la Navigation Fluviale et Lacustre- CSNFL*), created by Order No. 78-385 of 6 September 1978, is an advisory body of the Ministry of Transport and Communication with the following mission:

- to study and prepare inland waterways policy and submit proposals to the Government;
- to study all requests relating to the operation on the Congo River as well as its tributaries and the lakes;
- to review all amendments to international conventions and treaties relating to inland water navigation; and
- to study all the means to be implemented to promote and guide the development of inland water navigation.

In addition to the said authorities, other administrative institutions directly involved in the inland waterway transport sector in the DRC include:

- Ministry in charge of the Interior, Decentralization and Safety, particularly its office, the River, Lake and Maritime Police;
- Ministry of Finance, which, among other tasks, sets and collects the maritime and inland waterways' taxes and fees, ensures customs formalities, and controls administration budgets;

- Ministry of Planning, which has a maritime, river and lake transport office responsible for planning the development of port infrastructure and inland waterways transport;
- Ministry of Labour and Social Security;
- Ministry in charge of Agricultural Service Roads; and
- Ministry in charge of Hydrocarbons which has a Directorate of Distribution, Transport and Storage to regulate the transport of petroleum products via the maritime and inland waterways.

At the regional level, the International Commission of the Congo-Oubangui-Sangha Basin (CICOS)[52] was established under a regional agreement on November 6, 1999. CICOS, which has its registered office in Kinshasa, brings together six Congo River countries: Angola, Gabon, Cameroon, DRC, the Republic of the Congo, and the Central African Republic. The objectives of CICOS are at Table 4.3.

Table 4.3. Objectives of CICOS

CICOS Headquarters in Kinshasa	Objectives of CICOS
 https://www.cicos.int/category/navigation-interieure/	• ensuring the sustainable management of waterways; • harmonizing regulations on river transport for the safety of navigation and the promotion of the environment; • integrating all uses of water resources into regional planning; • optimizing water allocations by use; • sharing between the States the benefits generated by the uses of water; • supporting the development and fighting poverty in the sub-region; and • promoting food security.

[52] CICOS relies in its running funds on contributions from member countries, and donation from external sources such as the European Union; Federal Ministry for Economic Cooperation and Development, Germany; French Development Agency (ADF); World Bank; and the Group of African Banks of Development.

CICOS plays an important role by assisting member countries with implementing initiatives for inland shipping and sustainable water management. It provides coordination platforms between the six countries, including the private sector, to ensure regular information-sharing, consultation and participation on the part of the relevant actors and sectors in the member countries. CICOS provides continuous support to its Regional Training Centre for Inland Navigation (CRFNI)[53], established by Decision n° 04/CICOS/CM-05 of the Committee of Ministers in Yaoundé on December 13, 2007. CRFNI provides training to highly qualified personnel, such as captains and chief engineers assigned to the operation of the river transport of passengers and goods, and also personnel from other professions such as administrators, operators or port managers.

Bilateral and trilateral agreements preceded the creation of CICOS. The Brazzaville agreement and the creation of CICOS recognize a basin-wide community of interests.

Although DRC is a full member and signatory of the Brazzaville agreement, its government and officials view CICOS and the CEMAC-DRC Navigation Code as foreign policy instruments of CEMAC, a sub-region it is not a part of. DRC was the last country to ratify the Brazzaville agreement in 2003 and is yet to ratify the CEMAC-DRC Navigation Code.

Maritime and inland water transport regulations

At the international level in the maritime, the DRC has ratified six IMO Conventions - IMO Convention, 1948; International Convention for the Safety of Life at Sea (SOLAS 74); International Convention on tonnage measurement of ships, 1969 (TM 69); Convention on the International Regulations for preventing Collisions at Sea, 1972 (COLREG 72); Convention on Seafarers' Training, Certification and Watch-keeping, 1978 (STCW 78); and, London Convention, 1972.

At the national level, in terms of maritime governance, the Constitution of the Democratic Republic of Congo of February 18, 2006, as amended by Law n° 11/002 of January 20, 2011, grants the central government exclusive competence in maritime and inland navigation matters. In legal matters in DRC, including maritime issues, the Larcier Codes constitute a reference tool for civil,

[53] The Regional Training Centre for Inland Navigation was established in 2007 by CICOS. Since 2009, the CRFNI has trained more than 1,500 crew members and administrative staff. In 2013, the DRC Minister of Transport made it mandatory for all captains to obtain a certificate from the CRFNI to navigate on the river.

penal, commercial, labour, fiscal, public and administrative law. Ordinance Law n°66/98 relating to the Maritime Navigation Code and Law n° 66/96 of March 14, 1966, relating to the River and Lake Navigation Code constitute the basic legislative texts of the maritime and inland waterway transport sector in DRC. In addition to these Codes, DRC continues to refer to a large number of legislative norms dating from the colonial era, as listed at Table 4.4. However, reforms are on the Government's agenda to take into account the provisions of the various international instruments.

Table 4.4. Select legislative norms from the colonial era applicable to inland water transportation

- Ordinance 5TP of December 25, 1924 relating to the surveillance and policing of navigation on the Upper River, tributaries and lakes;
- Ordinance No. 41-336 of October 14, 1954 on the Police of River Ports;
- Ordinance 64-560 of December 22, 1958 relating to navigation and policing, protective measures for the waterway, engineering structures and port facilities;
- Ordinance No. 41/334 of October 26, 1954, as amended by Ordinance No. 64/157 of April 15, 1958 that includes the legal regime of the seaports of Matadi, Boma and Banana;
- Ordinance 63-13 of January 19, 1956 establishing maritime police stations in the localities of Léopoldville, Boma, Matadi and Kalemie;
- Ordinance 67/133 of March 12, 1967 on implementing measures, with regard to inspections and security certificates for commercial and fishing vessels;
- Ordinance No. 41/133 of October 9, 1954 on the handling and deposit of flammable substances in the seaports of Bas Congo and Ordinance No. 22/98 of March 27, 1956 on occupational safety; and
- Ordinance 68-126 of March 28, 1968 on the organic regulations of the maritime police.

There are also several Ministerial Decrees and Sectorial Circular Notes. Some relevant examples are listed in Table 4.5.

Table 4.5. Select Ministerial Decrees and Sectorial Circular Notes applicable to inland water transportation

- Decree No. 0051 of November 7, 1995 establishing the statutes of a public company called the National Office of Transport, abbreviated as "O.N.A.T.R.A.", in Code Larcier, Tome III, vol. 1, 2002 Edition;
- Ordinance 80-256 of 2 November 1980 establishing and statutes of the maritime freight management office, O.J.Z., n°22, 15 November 1980;
- Ordinance No. 71-308 of 3 December 1971 establishing the specifications for the Régie des Voies Fluviales;
- Ordinance n°78-198 of May 5, 1978 on the statutes of a public company called Régie des Voies Maritimes, J.O.Z., n°10, May 15, 1978, Larcier Code, Tome III, vol. 1, 2002 Edition, p.362; and
- Law No. 74-026 of December 2, 1974 creating the Compagnie maritime zaïroise, J.O.Z., No. 4, February 15, 1975, p. 124.

At the sub-regional level, for inland navigation, there are certain regulations put in place by CICOS including those listed at Table 4.6.

Table 4.6. CICOS regulations

- The Agreement establishing a uniform river regime and creating the International Commission of the Congo-Oubangui-Sangha Basin (CICOS) of November 6, 1999;
- The CEMAC-DRC Inland Navigation Code (not yet ratified by the DRC);
- Common regulations relating to the contract for goods by inland waterway; and
- Regulations for the construction and maintenance of inland navigation vessels.

4.4 Domestic ferry accidents in the DRC[54]

Trends in accidents

In the last ten years (2011-2021), DRC has experienced 30 accidents, resulting in a total of 2,130 fatalities. The set of sporadic accidents in the dataset for the DRC reflects an increasing trend in the DRC over the past decade (Figure 4.7).

[54] This section of the report is based on statistics drawn from the Arcsilea database.

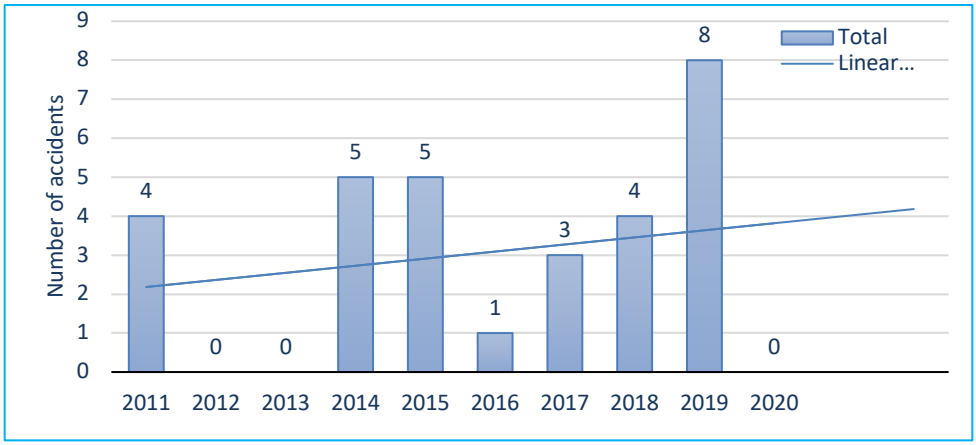


Figure 4.7. Trend of accidents in DRC: 2011-2021 (Source: Arcsilea)

As per the database, in 2020 there were no fatal domestic passenger ship accidents in the DRC. However, media reports indicate that on 16 March 2020 a canoe (traditional domestic passenger boat) carrying more than 30 people capsized while sailing on River Lukuga in the DRC as a result of which at least 15 people, mostly students, lost their lives (Figure 4.8). In fact, accidents occur daily in Congolese waters, in particular on the river routes. Occasionally, when bodies or property are found floating in the water, someone may coincidentally detect and report that an accident has occurred[55]. Otherwise, most accidents would apparently go unreported. Therefore, the factual accident numbers would be considerably higher than the database records of this study.

Figure 4.8. (a) Example of a canoe[56] (traditional domestic passenger boat); (b) Fatal canoe accident (2020)[57]

[55] Munyangeyo, A. (2021). Assessment and Proposals for Improved Transportation Safety on Congo River. Master's thesis, Høgskolen på Vestlandet. Western Norway University of Applied Sciences, Norway.

[56] BBC, 2021. Congo River: At least 60 drowned after boat capsizes. https://www.bbc.com/news/world-africa-56082260

[57] Anadolu Agency, 2020. Democratic Republic of Congo: 15 die in canoe accident. https://www.aa.com.tr/en/africa/democratic-republic-of-congo-15-die-in-canoe-accident/1768371

Causal factors of accidents

Although many different types of vessels are being used for transportation, more than 95% of them are wooden or mono-hulled fibre boats of traditional construction with an open deck. It is also worth emphasizing that usually, the river boats are considerably smaller and less seaworthy than those navigating on the lakes. Irrespective of the navigational area, fatal ferry accidents occur frequently in the DRC since the boats are poorly maintained, and mostly overcrowded with passengers who often cannot swim and rarely have life jackets[58, 59].

In a recent casualty, an overcrowded boat carrying more than 400 passengers capsized on 14 February 2021 after striking a rock[60] near Kinshasa while navigating on the Congo River. Although night navigation is prohibited, at the time of the accident, the boat was making a 435 nm night voyage from Kinshasa to Mbandaka City. DRC officials reported that more than 60 people lost their lives as a result of the accident, while 300 were rescued.

In DRC, the most frequently reported accident types were capsizing/sinking, followed by collision/sinking, representing 70% of the total accidents (Figure 4.9).

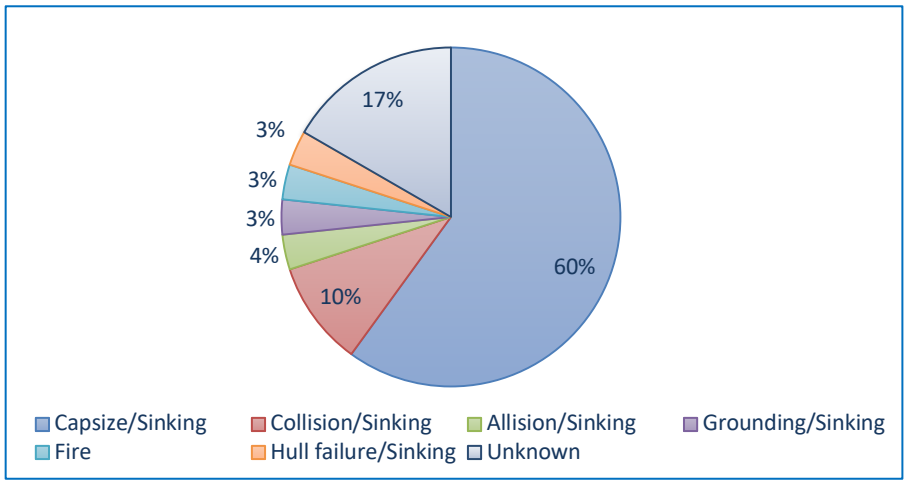


Figure 4.9. Percentage distribution of accidents in DRC: 2011-2021 (Source: Arcsilea)

[58] Munyangeyo, A. (2021). Assessment and Proposals for Improved Transportation Safety on Congo River. Master's thesis, Høgskolen på Vestlandet. Western Norway University of Applied Sciences, Norway.

[59] Baird, N. (2018). Fatal ferry accidents, their causes, and how to prevent them. PhD thesis, Australian National Centre for Ocean Resources and Security, University of Wollongong, Australia.

[60] BBC, 2021. Congo River: At least 60 drowned after boat capsizes. https://www.bbc.com/news/world-africa-56082260

Geographic distribution of accidents

The geographical distribution of accidents indicates that 46% of the accidents occurred on lake routes, and 43% of the accidents occurred on river routes. Congo River (20%), Lake Kivu (20%), Lake Mai (14%), and Lukenye River (10%) are the main areas where accidents occurred more frequently. Accidents occurred frequently in the Congo River, on Kisangani-Isangi, Bandunu Province routes, Kwamouth routes, Tshuapa Province routes, and Tshopo Province routes. In Lake Kivu, accidents occurred frequently on routes to and from Goma, Bukavu, Eastern DRC, and Idjwi Island. In Lake Mai, accidents occurred frequently on routes to and from different points of Ndombe i.e., Lukanga-Inongo, Botangere-Selenge, Kesenge-Inongo and Inongo-Selenge. In the Lukenye River, accidents occurred frequently on Kasai Province routes (Figure 4.10).

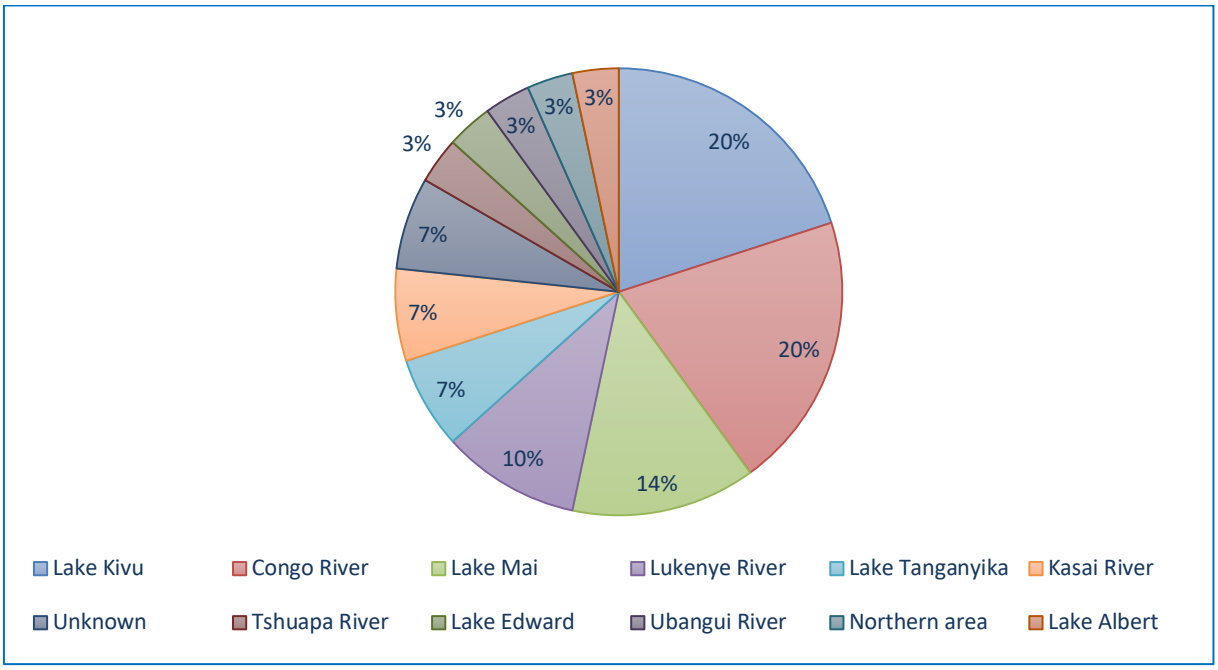


Figure 4.10. Percentage distribution of accidents in DRC by location: 2011-2021 (Source: Arcsilea)

Based on the accident data examined, it can be said that the accident-prone areas will be important to consider when determining the areas where safety intervention is required. On those routes, the most cited causes in the literature leading to accidents include overloading, followed by poorly maintained (unseaworthy) boats, lack of education and training of crew and

masters who generally have little or no formal maritime education or training[61]. More interestingly, even crocodiles and hippopotamus in the rivers and lakes are turning into hazards in combination with poor formal search and rescue services which can cause loss of lives. In 2012, on the Congo River near Kinshasa, it was claimed that 170 people were taken by crocodiles. [62, 63]

4.5 Previous external funding for inland water transport in DRC

The DRC's inland waterways transport has benefited in the last two decades from two major projects funded by the World Bank and the European Development Fund.

The Multimodal Transport Project was funded by the World bank with USD 435 million. The river and lake sector benefited from USD 8.85 million for the RVF from this project. The project was launched in 2004 for five years, to 2010 and then extended for additional five years until 2015.

The Support Programme for the Navigability of Rivers and Lakes Waterways was financed by the European Development Fund through a grant of 60 million euros. The EU-DRC project was signed in December 2010. The project targeted three main navigable reaches: Kinshasa-Kisangani on the Congo River, Kwamouth-llebo on the Kasai River, and the reach over the Tanganyika Lake. The main stakeholders in this program were the MTVC, RVF, CVM, SCTP, SNCC and CICOS.

[61] Munyangeyo, A. (2021). Assessment and Proposals for Improved Transportation Safety on Congo River. Master's thesis, Høgskolen på Vestlandet. Western Norway University of Applied Sciences, Norway.

[62] Baird, N. (2018). Fatal ferry accidents, their causes, and how to prevent them. PhD thesis, Australian National Centre for Ocean Resources and Security, University of Wollongong, Australia.

[63] Congo Travel and Tours. (2022). Kinshasa. https://congotravelandtours.com/travel-in-congo/

5 INDONESIA

5.1 General information and characteristics of Indonesia

Geography

Indonesia is an island country, located between mainland Southeast Asia and Australia in the Indian and Pacific Oceans. It covers a total area of 1,919,440 sq km (land area: 1,826,440 sq km; water area: 93,000 sq km). It shares borders with seven countries: Malaysia, the Philippines, and Brunei on the North; Papua New Guinea and Timor-Leste on the East; Sri Lanka on the West; and Australia on the South.

Indonesia is the world's largest archipelago, consisting of more than 17,000 islands, of which about 6,000 are inhabited. There are two major archipelagos: Nusa Tenggara and the Maluku Islands, and about 60 smaller archipelagos. The biggest islands in Indonesia are Sumatra, Java, Borneo (known as Kalimantan in Indonesia), Sulawesi, and New Guinea. Four islands are shared with other countries: Borneo with Malaysia, Brunei and Sebatik also with Malaysia, Timor with East Timor, and New Guinea with Papua New Guinea (Figure 5.1).

Figure 5.1. Map of Indonesia (Source: World Atlas, 2022)

Indonesia has approximately 95,000 km of coastline. The archipelagos include seven seas: Java, Banda, Bali, Flores, Timor, Celebes, and the Arafura Seas. Additionally, there are two important straits, the Makassar Strait between Borneo and Sulawesi and the Malacca Straits between Malaysia and Sumatra.

Many rivers flow throughout the country. The Kapuas is the longest river. It is located in Borneo and runs for 1,143 km. Other rivers include: Musi, Batanghari, Indragiri, and Kampar Rivers in Sumatra; the Kapuas, Barito, Mahakam, and Rejang Rivers in Kalimantan; and the Memberamo and Digul Rivers in Irian Jaya.

Indonesia has a hot and humid climate, with an average temperature of 26 °C. November to March is the monsoon season. Tsunamis and floods are among Indonesia's most significant weather hazards.

Demographics

Indonesia is the fourth most populous country in the world, with a population of more than 270 million[64]. Almost 60 percent of Indonesia's population resides on Java Island, making it the most populous island in the world. Jakarta is the capital and largest city in Indonesia, and is located in northwest Java. Jakarta is home to more than 10 million people, making it the largest city in Southeast Asia, and one of the world's most populous urban agglomerations[65].

Indonesia is one of the world's most linguistically diverse nations, with over 700[66] spoken languages. English is the *lingua franca*[67]. Over 90 percent of the population speaks Indonesian, but it is the primary language of only 20 percent of the people. At the same time, Javanese (Jawa) is the most common primary language, with over 30 percent of the population speaking it.

[64] Statista. (2022). Demographics of Indonesia - statistics & facts. https://www.statista.com/topics/8377/demographics-of-indonesia/#dossierKeyfigures.

[65] World population review. (2022). Jakarta population 2022. https://worldpopulationreview.com/world-cities/jakarta-population

[66] Ravindranath, M., & Cohn, A. C. (2014). Can a language with millions of speakers be endangered?.

[67] Zein, S. (2020). Language policy in superdiverse Indonesia. Routledge.

Political

The Republic of Indonesia was declared in 1945 with jurisdiction from Sabang in Sumatra to Merauke in Papua. Yogyakarta became the provisional capital. Although the Republic of the United States of Indonesia, was founded in 1949, a year later, in 1950, the federated governments returned to a unitary system and named the Republic of Indonesia. A presidential decree reinstated the 1945 constitution, and this constitution remains the basis of Indonesia's government albeit with some significant amendments.

Indonesia is divided into 30 provinces (*provinsi*), plus the special districts (*daerah istimewa*) of Yogyakarta in central Java and Aceh in northern Sumatra, and the special capital district (*daerah khusus ibukota*) of Jakarta, known as Jakarta Raya.

Indonesia is a presidential representative democratic republic with a multi-party system. The President is both, the Head of State and Head of Government. Executive power is exercised by the government. Legislative power is shared by both, the government and the bicameral People's Consultative Assembly. The judiciary is independent of executive and legislative powers.

Executive power vests largely with the President of the Republic of Indonesia who is assisted by a Vice President and a Cabinet of Ministers. Until 2002, the President and Vice President were elected by the People's Consultative Assembly, but since 2004 both leaders were to be directly elected via a popular vote. Also, the 1999 legislation limited the president to two, 5-year terms. The President appoints the cabinet ministers. The President is also the Supreme Commander of the army, navy, and air force. In addition, the President has the authority to introduce legislation, issue regulations, implement laws, and negotiate treaties with foreign countries. The Constitution also provides the President with an advisory body namely, the Supreme Advisory Council (*Dewan Pertimbangan Agung*), whose advice is not legally binding, and a presidentially appointed Supreme Audit Board (*Badan Pemeriksa Keuangan*), which controls State finances.

The People's Consultative Assembly (*Majelis Permusyawaratan Rakyat*, or MPR) is the legislative branch of the government of Indonesia. The MPR is primarily tasked with interpreting the constitution and the broad lines of State policy. Since the 2004 elections, the MPR has been bicameral, with the Council of People's Representatives (*Dewan Perwakilan Rakyat*, or DPR) as

the lower house and the Council of Regional Representatives (*Dewan Perwakilan Daerah*, or DPD) as the upper house. About 80% of the MPR seats are in the DPR. The DPR members are elected through a province-based proportional system, while the DPD members are elected directly from a nationwide pool of nonpartisan candidates. All legislators serve five-year terms.

The judicial system in Indonesia comprises the Jakarta Supreme Court (*Mahkamah Agung*) as the final court of appeal, while high courts in principal cities hear appeals from district courts. The President chooses the Supreme Court judges from the nominees presented by the Judicial Commission, a special body appointed by the upper house (DPD). The judges are civil servants, overseen by the Supreme Court and the Judicial Commission. In addition, the Supreme Court justices choose the Chief Justice and Deputies. Another court within the Indonesian judicial system is the Constitutional Court (*Mahkamah Konstitusi*). Established in 2003, its mission is to review president-related cases.

As for the legal framework, under the colonial administration, the law was a mix of Dutch and local customary law known as *adat*. Since independence, criminal law has been codified for all of Indonesia. Civil law, however, continues to be based on *adat*. There are four judicial spheres, including general matters, religious, military, and administrative, each with its own courts. The religious, military, and administrative courts handle special cases or groups of cases, while the general courts handle both civil and criminal cases. Over 87% of Indonesian are Muslims and may choose to use Islamic law in some civil cases whereas, since the mid-1970s, religious law has applied to all marriage-related civil matters.

Economy

Indonesia is the largest economy in Southeast Asia and one of the world's emerging market economies. In 2021, the country recorded a nominal GDP of USD 1.19 trillion[68], and a GDP per

[68]The World Bank. (2022). GDP, PPP (current international $) – Indonesia. https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?locations=ID.

capita (PPP) of USD 3.57 trillion[69]. Over the past two decades, sound economic policies have contributed to the country's steady growth, fluctuating around 5% p.a.

As a G20 member with a middle income, Indonesia is classified as a newly industrialized country[70]. The country relies on its domestic market, government budget expenditures, and state-owned enterprises. It is a significant exporter of crude petroleum and natural gas. In addition, Indonesia is one of the world's leading suppliers of rubber, coffee, cocoa, and palm oil. It also produces a wide range of other commodities, including sugar, tea, tobacco, copra, and spices (such as cloves).

Because of its easy entry requirements and strategic location between Asia and Australia and the Pacific and Indian Oceans, Indonesia is a preferred transit nation for asylum seekers. Recent asylum seekers included Afghans, Rohingyas, Iraqis, Somalis, and Sri Lankans. Indonesia is also a source of migrant labour, and highly skilled migrant workers in particular. The last decades of high unemployment and underemployment, domestic poverty, and low wages have resulted in legal and illegal international labour migration from Indonesia to other parts of the world, such as Malaysia and the Middle East, Australia, Canada, New Zealand, and the United States.

Although Indonesia has recorded significant economic growth in the last decades, its economic landscape still includes poverty, unemployment, inadequate infrastructure, corruption, a complex regulatory environment, and unequal resource distribution among its regions.

[69] The World Bank. (2022). GDP (current USD)- Indonesia. https://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD?locations=ID. https://tradingeconomics.com/indonesia/gdp#:~:text=GDP%20in%20Indonesia%20averaged%20317.06,5.67%20USD%20Billion%20in%201967.

[70] G20 INDONESIA 2022. Explore Indonesia. https://g20.org/explore-indonesia/

5.2 Maritime profile of Indonesia

Shipping industry

Indonesia's location between Asia and Australia and the Indian and Pacific Oceans makes its sea area an important shipping lane for the international community[71]. The country's more than 17,000 islands can only be connected by sea; therefore, the sea unites, rather than divides, Indonesia's islands, areas, and regions.

The national shipping industry in Indonesia is regarded as a strategic sector, and its development is of high priority to improve the country's competitiveness in the global market[72]. At least since 2014, the government has boosted maritime infrastructure development in Indonesia to match other major infrastructure projects. Yet the existing infrastructure is inadequate to meet the current volumes of trade. The government thus continues to focus on improving maritime infrastructure, including ports and island connectivity.

Indonesia has hundreds of small ports throughout its islands. Of the larger ports, eleven are commercial ports operated by state-owned companies, and eleven are container ports[73].

Jakarta's Tanjung Priok port is the leading international gateway and a significant entry point for domestic trade, through which 70% of Indonesia's container exports and imports pass. The container port was the 22nd busiest in the world as per Lloyd's One Hundred Ports 2019. In 2021, it handled 6.8 million TEUs[74]. In addition, approximately 14 million passengers and over 300 million tons of cargo are transported annually via inter-island shipping.

[71] DUHA, Junindra et SAPUTRO, Guntur Eko. Blue Economy Indonesia to Increase National Income through the Indian Ocean Rim Association (IORA) in the Order to Empower the World Maritime Axis and Strengthen State Defense. JMKSP (Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan), 2022, vol. 7, no 2, p.514-527.

[72] HARTANTO, Hartanto, VICTORIA, Ong Argo, et CHUASANGA, Anirut. Maritime transportation of Indonesian policy. Jurnal Pembaharuan Hukum, 2019, vol. 6, no 1, p. 36-44.

[73] Open to Export. (2022). Ports Sector in Indonesia. https://opentoexport.com/article/ports-sector-in-indonesia/.

[74] Damas Jati. (January, 2022). Priok Enjoyed 8.78% Container Throughput Growth in 2021. The Shipping Gazette. https://theshippinggazette.com/priok-enjoyed-8-78-container-throughput-growth-in-2021/.

Regarding the merchant fleet, the operational Indonesian' flagged ships in 2020 were estimated at 10,762, according to UNCTAD Statistics (Figure 5.2). Indigenously built vessels comprise about a fifth of the flag vessels, whereas ships built in Japan and the EU account for nearly 50% and 15% of the fleet, respectively[75].

Figure 5.2. Maritime profile of Indonesia (UNCTAD, 2021)

Indonesia also has a long history of shipbuilding. There are approximately 250 shipyards in Indonesia with a production capacity of one million DWT per year for new shipbuilding and about 12 million DWT per year for ship repair[76].

Domestic ferry transport in Indonesia

With more than 17,000 islands, ferry transportation is crucial for connecting people and moving goods from one island to another. In 2020, Indonesia had approximately 472 inland boats and ferries, serving about 49 million passengers.

Ferry transport in Indonesia is operated by the State and with State subsidies. Three types of shipping companies offer inter-island passenger services as follows:

- the State-owned PT PELNI network delivering vital services all over the country. PT PELNI Indonesia Ferry (Persero), the largest ferry operator in Indonesia, owned 154 ferries, according to 2020 statistics;[77]

[75] World Maritime University. (2018). DOMESTIC FERRY SAFETY IN INDONESIA: HAZID/Scoping exercise to identify safety issues pertaining to passenger ships in Indonesia not engaged in international voyages.

[76] Indonesia Water Portal. (February, 2020). The Ministry of Industry Supports the Development of the Shipyard Industry. https://www.indonesiawaterportal.com/news/the-ministry-of-industry-supports-the-development-of-the-shipyard-industry.html

[77] Statista research department. (2022, March). Number of inland boats and ferries Indonesia 2013-2020.

- mid-size companies operating trunk line passenger services by RO/RO passenger ships and speed boats; and
- local small-size companies offering service by small speed boats.

There are, in total, 380 RoPax ferries in Indonesia (see examples in Figure 5.3). The ownership of these RoPax ferries is split between the State-owned company, PT ADSP (148 ferries; 54%), local government, BUMD (25 ferries; 7%), and the private sector (207 ferries; 39%).

Figure 5.3. Ferry ships in Indonesia (Source: https://www.indonesiaferry.co.id/en/home)

Registration of vessels, including ferries, is handled by two separate bodies. Ships over 7 GT are registered with any one of the Directorate General of Sea Transportation (DGST) local Port Administration Offices (Pelabuhan- ADPEL) or Port Offices (Kantor Pelabuhan- KANPEL). Ships of over 100 GT or over 20 meters in length are registered with the Indonesian Classification Bureau (Biro Klasifikasi Indonesia, or BKI) registry.

Several types of traditional boats are engaged in domestic shipping in Indonesia.[78] Traditional ships currently found in Indonesia fall into four types (see examples in Figure 5.4):

- Nade from Western Indonesia, especially around Sumatra Island;
- Lete with an average tonnage capacity of 25-70 m^3, dominant in Java and Madura;
- Lambo from South-East Sulawesi with an average capacity of 25-250 m^3; and
- Phinisi or Pinisi from South Sulawesi which is now the predominant type of traditional ship found almost everywhere in Indonesia.

[78] Charlotte Minh-Hal Pham. 2012. Unit 14 Asian Shipbuilding Technology, UNESCO Bangkok.

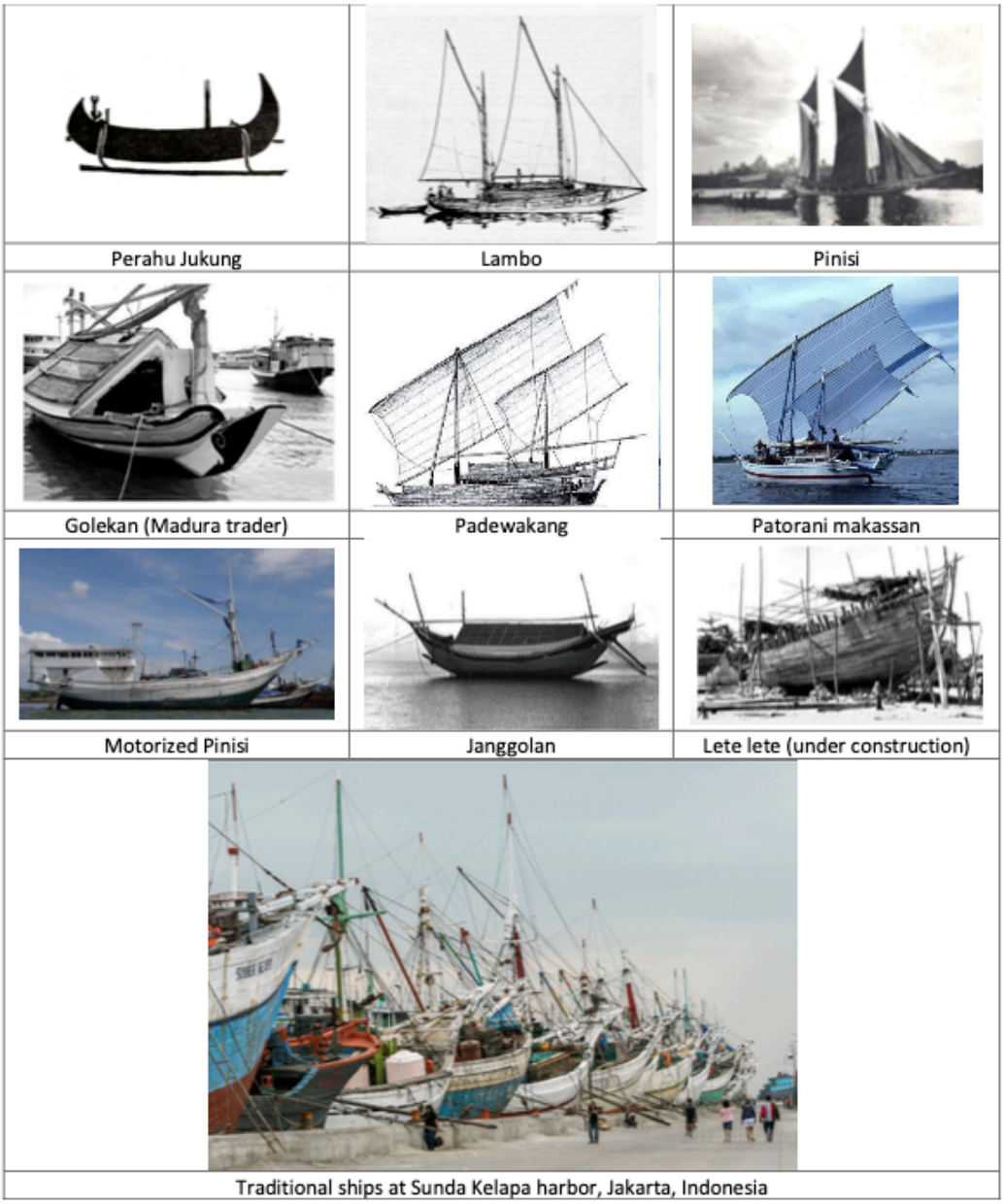


Figure 5.4. Traditional boats in Indonesia

Without official records, it is difficult to ascertain the precise numbers of the traditional boats. According to the Indonesia Investment, Trade Strategy and Agreements Handbook (2016), the number of traditional ships in 1989 was 4,000, with a capacity of 200,000 DWT. However, current numbers may be expected to be far lower, given that the government of Indonesia has banned logging, and at least half the shipping casualties each year involve traditional ships, many of which end up as a constructive total loss.

Indonesia has three primary ferry lanes, the North, Middle, and South belts, served by long-distance ferry services. The longest ferry route is 530 nm. There are 278 ferry lanes across the Indonesian archipelago served by the 380 Ro Pax ferries. Of these, 55 are commercial lanes served by 289 ferries, and the remaining 223 are pioneer routes operated by 91 ferries. Figure 5.5 provides a broad overview of the domestic ferry routes.

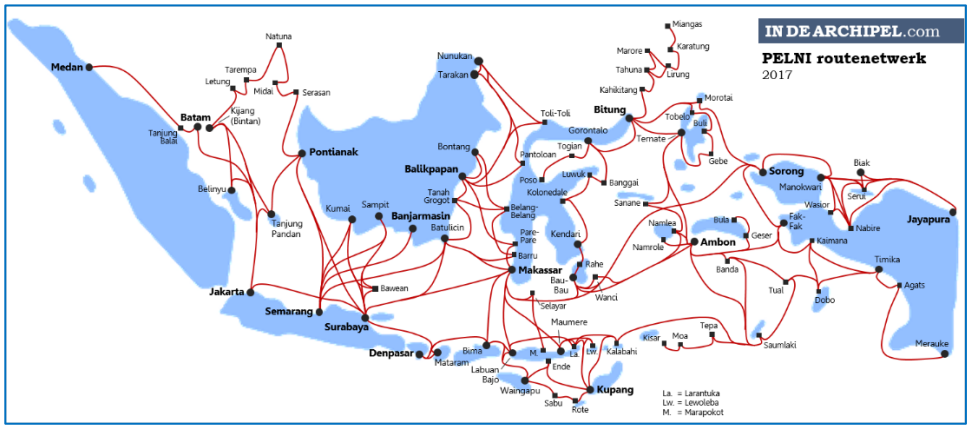


Figure 5.5. Ferry routes in Indonesia (https://indearchipel.com/2017/03/22/reizen-pelni-schip-indonesie/)

Indonesia has around 2,100 ports, of which 111 are managed and operated by PT (Persero) Pelabuhan Indonesia/Public Port Corporation (PELINDO), and 141 are designated as international ports and open to international trade. Ten commercial and 33 non-commercial ports connect 13 routes (T1-T13), integrating the sea highway with current ferry lanes. The ferry operations are supported by 213 ferry ports and would be further augmented by the 24 ports under construction and another 209 planned for development. Figure 5.6 presents examples of ferry ports.


Padangbai Port


Bakauheni Port


Ketapang Port


Pototano Port

Figure 5.6. Ferry ports in Indonesia (https://www.indonesiaferry.co.id/en/home)

5.3 Domestic ferry transport regulatory framework in Indonesia

General overview of the legal framework

Indonesia has signed the United Nations Convention on the Law of the Sea (UNCLOS). It is also party to several IMO instruments: International Convention for the Safety of Life at Sea, as amended (SOLAS); Convention on the International Regulations for Preventing Collisions at Sea, as amended (COLREG); International Convention for the Prevention of Pollution from Ships, as amended by its Protocol of 1978 (MARPOL), as well as Annexes III, IV, and V of the Convention; and the International Convention on Civil Liability for Oil Pollution Damage (CLC) and its Protocol of 1992.

The primary source of maritime law in Indonesia is Law No. 17 of 2008 on Shipping (the Shipping Law). The law contains 355 articles that govern the public and private aspects of maritime law, including maritime safety, security, seaworthiness, port affairs, and protection of the marine environment. The Shipping Law provides the legal framework for shipping activities in Indonesia. It also establishes penalties for violations of its various provisions.

Indonesia has also enacted various national laws, some of which implement some of the aforementioned international treaties. A non-exhaustive list is presented at Table 5.1.

Table 5.1. Non-exhaustive list of national maritime legislation in Indonesia.

- Law No. 32 of 2014 on Ocean Affairs (Ocean Law);
- Law No. 6 of 1996 on Indonesian Waters (Waters Law);
- Law No. 5 of 1983 on the Indonesian Exclusive Economic Zone;
- Law No. 36 of 2002 relating to innocent passage (Innocent Passage Regulation);
- Law No. 37 of 2002 relates to the passage through Indonesia's partially designated archipelagic lanes (Archipelagic Sea Lanes Passage Regulation);
- Law No. 32 of 2009 on the Protection and Management of the Environment and Government Protection of the marine environment;
- Law No. 19 of 1999 on the Control of Marine Pollution and/or Degradation;
- Law No. 27 of 2007, as amended by Law No. 1 of 2014 on the management of coastal areas and small islands ("Coastal Law"); and
- Law No. 21 of 2010 on the Protection of the Maritime Environment implements the CLC and its Protocol of 1992.

Some of the significant instruments that govern the maritime safety of ferries engaged in domestic voyages are presented in Table 5.2.

Table 5.2. Non-exhaustive list of national ferry safety legislation in Indonesia.

- Act No. 17 of 2008 related to shipping;
- Government Regulation No. 7 of 2000 related to seafarers;
- Government Regulations No. 51 of 2001 corresponding to shipping;
- Government Regulations No. 21 of 2010 about marine environmental protection;
- Ministerial Decree No. 65 of 2009 associated with Non-Convention Vessel Standards (NCVS) for Indonesian flagged vessels;
- Ministerial Decree No. 45 of 2012 related to Ship Safety Management;
- Ministerial Decree No. 7 of 2013 related to the obligation for Indonesian flagged vessels to work with the Indonesian Classification Bureau, as amended by Ministerial Decree No. 61 of 2014;
- Ministerial Decree No. 70 of 2013 related to education, training, certification, and watchkeeping of Seafarers, as amended by Ministerial Decree 140 of 2016;
- Ministerial Decree No. 20 of 2015 about shipping safety standards;
- Ministerial Decree No. 39 of 2016 related to loading line and stowage;
- Ministerial Decree No. 30 of 2016 related to the obligation for lashing of vehicles in ferries;
- Director General of Sea Transportation Decree UM.008/9/20/DJPL-12 related to technical Instructions regarding NCVS;
- Director General of Sea Transportation Decree HK.103/2/19/DJPL-16 related to ship's seaworthiness;
- Director General of Sea Transportation Decree HK.103/1/3/DJPL-17 related to docking procedures for Indonesian flagged vessels; and
- Director General of Sea Transportation Decree HK. 103/2/9/DJPL-17 related to instructions for traditional passenger vessels.

In particular, the main regulation to cover the technical arrangements for the design, equipment, maintenance, and operation of passenger ships not engaged in international voyages is the Non-Convention Vessel Standards (NCVS) promulgated by DGST in 2009. NCVS, comprising nine chapters, sets comprehensive requirements for construction, equipment, life-saving appliances, machinery and electricity, load lines, tonnage measurements, manning, and operational management.

The standard applies to all vessels on domestic voyages, vessels of less than 500 GT on international voyages, vessels with non-mechanical propulsion, wooden vessels with engines or under sail with auxiliary engines, fishing vessels, pleasure craft, vessels with novel design and State vessels used for commercial purposes. Cruise liners covered by international conventions are excluded. Ships built to the standards of other flag states and imported for operation in Indonesian waters are, in principle, required to meet the standard. However, exemptions may be granted as determined by DGST.

The regulations categorize vessels based on their use as passenger vessels (Category 1), non-passenger vessels (Category 2), and fishing vessels (Category 3). The regulation also classifies voyages within 15 nautical miles as near coastal voyages in sheltered waters (smooth waters – category E; partially smooth waters – category D). Operations within 30 nautical miles of a safe haven are classified as Restricted Offshore Operations (category C). In comparison, operations within a limit of 200 nautical miles from the coast are termed Offshore operations (category B) and those beyond Unlimited operations (category A). This categorization from A to E includes both design and environmental parameters in order of severity as applied to operational matters, weather and sea characteristics, survival and rescue infrastructure, assumed gusting wind pressure, Beaufort Scale, design significant wave height, and so on.

Figure 5.7 provides an overview of the structure of law applicable to domestic ferries, including traditional ships in Indonesia.

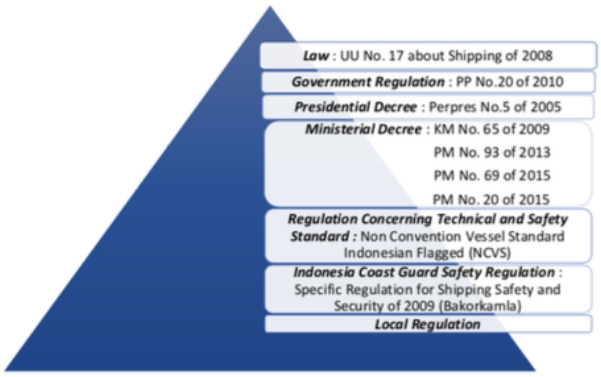


Figure 5.7. Structure of law relating to domestic shipping in Indonesia (Muhana, 2017)[79]

[79] Muhammad Faiq Farras Muhana. 2017. The Importance of Indonesia People's Shipping (Pelayaran Rakyat) in Terms of Value Added, Employment, and Competitive Position. MSc thesis. Erasmus University Rotterdam.

Institutional Framework

Twenty-one State bodies administer, apply and enforce maritime law in Indonesia: eighteen executive agencies, two judicial bodies namely, the Supreme Court and Constitutional Court, and a quasi-judicial body, the Court of Shipping Affairs[80, 81].

The Ministry of Maritime Affairs (MMAF) is primarily responsible for regulating sea-related matters and administering and monitoring the implementation of maritime laws. In addition to the MMAF, the Ministry of Energy and Mineral Resources and the Ministry of Tourism are responsible for adopting maritime regulations and overseeing their implementation. The Coordinating Ministry for Maritime Affairs coordinates the efforts of these three ministries, the Ministry of Transportation and any other institutions deemed necessary.

The Ministry of Transportation (Kementerian Perhubungan), and in particular its Directorate General of Sea Transportation (DGST), is the main administrator for shipping matters. According to the Ministerial Regulation of Transport (Peraturan Menteri Perhubungan), No. 189 of 2015, Art. 336, the DGST is charged with the responsibilities of formulating and implementing policy; establishing norms, standards, procedures, and criteria; providing technical guidance; and supervision, evaluation and reporting in the field of seaworthiness besides maritime safety and marine environment protection. Each matter is handled by a separate Directorate as follows:

- Secretariat of Directorate General;
- Directorate of Sea Traffic;
- Directorate of Seaport and Dredging;
- Directorate of Maritime Safety and Seafarers;
- Directorate of Marine Navigation;
- Directorate of Sea and Coast Guard; and
- Technical Executive Unit (Unit Pelaksana Teknis).

[80] Laksmana, E. A. (2022). Remodelling Indonesia's Maritime Law Enforcement Architecture. Contemporary Southeast Asia, 44(1), 122-149.

[81] Ikrami. H. & Bernard. L. (2018). Indonesia's Maritime Governance: Law, Institutions and Cooperation. Korean journal of international and comparative law, 6 (2018) 134–171.

DGST is also the point of contact in Indonesia for the International Maritime Organization (IMO).

Domestic ferries are considered an integral part of Indonesia's infrastructure and are frequently referred to as an extension of the country's road network. As a consequence, the Directorate General of Land Transportation (DGLT) under the Ministry of Transportation is also involved, in particular, in regulating inland waterways and ferry services. The DGLT is made up of the following five directorates:

- Directorate of Land and Multimodal Transport;
- Directorate of Land Transportation Infrastructure;
- Directorate of Land Transportation Means;
- Directorate of Land Transportation Traffic; and
- Directorate of Road Safety.

The mission of DGLT covers four aspects – regulation, safety and security, infrastructure and facilities, and human resources. The DGLT, through the Directorate of Land and Multimodal transport, is responsible for managing and supervising all ports in Indonesia and inland waterways and ferry services. The administration is carried out by a Manager of Land Transportation, one for each of the 25 areas of the archipelago.

Several executive organs are responsible for enforcing maritime law. The State Police, particularly its Marine Division, is responsible for law enforcement in all Indonesian waters. On the other hand, the Navy is responsible for defence and law enforcement on all “waters under national jurisdiction in accordance with national and international laws,” resulting in the Navy being also tasked with protecting the Indonesian Exclusive Economic Zone.

Among other agencies involved in enforcing shipping law is the Indonesian Maritime Security Agency (*Badan Keamanan Laut Republik Indonesia*, or BAKAMLA). Established under Law Number 32/2014, it is responsible for ensuring security, safety, and law enforcement at sea. The task of the security agency is to conduct security and safety patrols in the territorial waters of Indonesia and the jurisdiction of Indonesia. According to Article 63 of Law No. 32/2014, BAKAMLA has authority as follows:

- to conduct an immediate pursuit;
- to dismiss, examine, arrest, carry, and deliver vessels to relevant authorities for further legal process execution; and
- to synergize the information system of security and safety in the territorial waters of Indonesia and the jurisdiction of Indonesia.

Table 5.8 provides information about the most relevant authorities in Indonesia and their involvement in regulating domestic ferry transport.

Figure 5.8. Authorities involved in domestic ferry transport regulation in Indonesia [82]

Mission	Responsible Authority
Authority in charge of domestic ferry safety regulations (construction, equipment, crewing, and qualification)	Directorate of Marine Safety and Seafarers under the Directorate General of Sea Transportation (DGST).
Authority in charge of aids to navigation, navigation/traffic management, radio communication	The Directorate of Maritime Navigation is under the Directorate General of Sea Transportation (DGST).
Authority in charge of accident investigations	a) Directorate of Sea and Coastguard, under the Directorate General of Sea Transportation (DGST); and b) National Safety Transportation Committee (NTSC-KNKT), under the Ministry of Transportation.
Authority in charge of monitoring and overseeing the recognized organizations	Directorate of Marine Safety and Seafarers, under the Directorate General of Sea Transportation (DGST).
Authority in charge of emergency response	National Search and Rescue Agency (BASARNAS).
Authority in charge of licensing of ferry services.	*Licensing for operations for Passenger / Ro-Ro (Vehicles/rail) Ship:* Directorates of Land and Multimodal Transport, under the Directorate General of Land Transportation (DGLT). *Licensing for operations for Passenger Ship:* Directorate of Marine Safety and Seafarers, under the Directorate General of Sea Transportation (DGST).
Authority in charge of supervision of ports/terminals for domestic ferry services	For terminal of Passenger/Ro-ro (Vehicles/rail) ship is under Port Authority for Inland Waterways (OPP) of DGLT. For Passenger Ship, the authority is Harbour master (Syahbandar) of DGST.

[82] World Maritime University. (2018). Domestic Ferry Safety in Indonesia: HAZID/Scoping exercise to identify safety issues pertaining to passenger ships in Indonesia not engaged in international voyages.

Regarding judicial matters, the Supreme Court and the lower courts, as well as the Constitutional Court, are responsible for the application and interpretation of maritime law in Indonesia.

Additionally, the Court of Shipping Affairs (Mahkamah Pelayaran)[83] is created under the Shipping Law. It is not, in fact, a Court of law. It is part of the executive branch and reports to the Ministry of Transportation. The Mahkamah Pelayaran is responsible for investigating maritime incidents and enforcing the code of ethics for seafarers. It has jurisdiction over incidents such as ship collisions, shipwrecks, and fires onboard. Its decisions are advisory and administrative, and many of its functions resemble those of a fact-finding or ethics commission.

5.4 Domestic ferry accidents in Indonesia[84]

Trends in accidents

Sixty accidents involving domestic passenger ships in Indonesia are recorded in the database for the period 1 January 2011 to 1 January 2021. The slightly decreasing trend in the annual number of reported fatal accidents over the past decade (Figure 5.9) should be weighed against the fact that Indonesia recorded the highest number of accidents among the seven examined countries. Indonesia has implemented multiple safety initiatives in the last decade as a result of which, it is understood that the accident reporting culture is improved and ferries carrying passengers between named terminals (fixed liner services) are operated more safely.

A personal interview conducted with a participant with more than ten years of service on the National Transportation Safety Committee (Committee Nasional Keselamatan Transportasi, KNKT) revealed that the definition and governance of “ferry” and “passenger boat/vessel” are different in Indonesia. A ferry is a vessel dedicated and registered to a defined and specific ferry route, and regulated by the DGLT. On the other hand, small traditional crafts/boats/vessels called “Penyeberangan” function as a “water bridge” between islands carrying only passengers, and are regulated by the DGST. For non-convention vessels, national regulations are in place (mentioned

[83] Shipping Law, supra note 18, art. 250.

[84] This section of the report is based on statistics drawn from the Arcsilea database.

as mini-SOLAS during the interview); however, it was emphasized that this is very challenging to both implement and enforce.

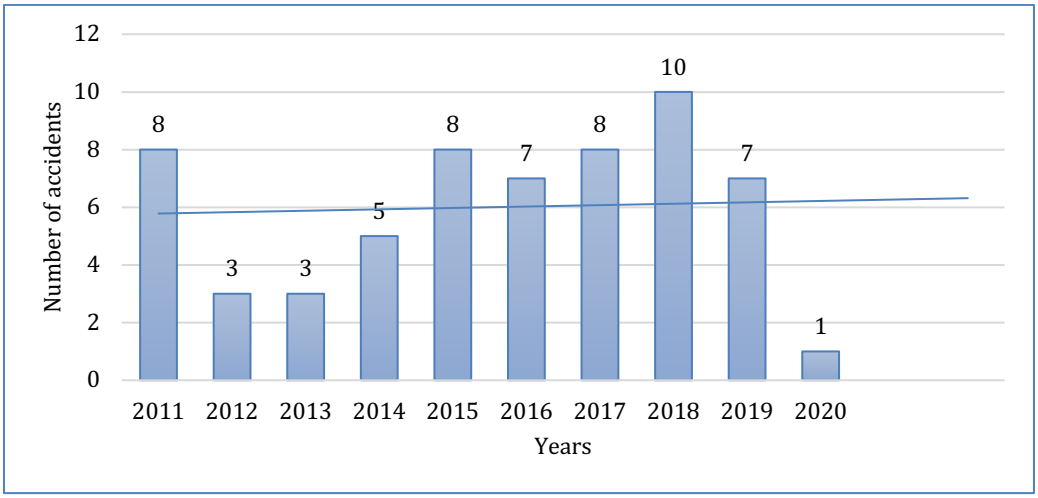


Figure 5.9. Trend of accidents in Indonesia 2011-2021 (Source: Arcsilea)

According to the interview, for ferries under DGLT, accident numbers and severity of consequences show an improving trend. However, since their operating tempo is very high (precisely; 15 minutes for coming-alongside manoeuvre, 15 minutes for unloading (cars and passengers), 15 minutes for loading, and 15 minutes for departure), it is extremely challenging to apply all safety requirements (i.e. passenger count, weight check of cars). On the other hand, for traditional wooden crafts/boats/vessels, safety issues are still critical. The accident numbers are not decreasing as desired and there is room for improvement. However, the interviewee clearly stated that, at every government level, there is a genuine wish to apply safety interventions that can reduce the number of accidents and improve maritime transport safety.

Causal factors of accidents

In the last decade, 1,516 people lost their lives in 60 accidents, indicating an annual fatality average of more than 150. Furthermore, the study revealed that capsizing/sinking and fire, representing 85% of total accidents are the two most frequent casualties (Figure 5.10). The causes of domestic passenger shipping accidents in Indonesia which are frequently listed in the documentation include; overcrowding, overloading, heavy weather and sea conditions, fire in cargo spaces and passenger cabins, use of the vessel in unseaworthy conditions, electrical

equipment failure, engine failure, poor lookout, unattended floating/submerged objects, inadequate dredging, loss of stability (imbalance, capsizing)[85,86,87].

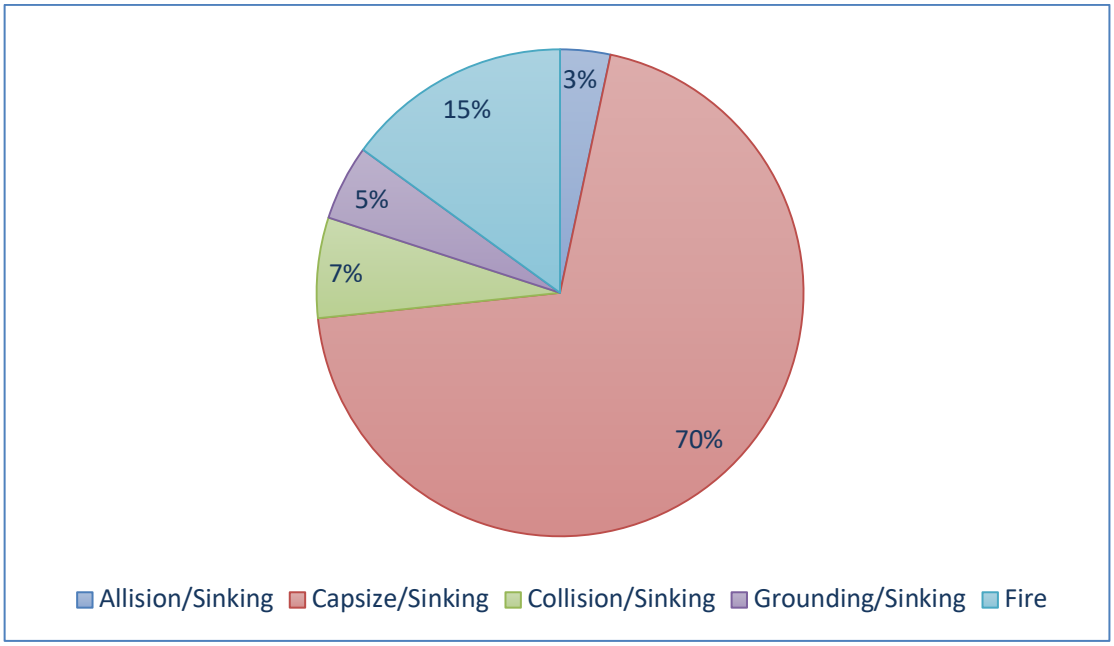


Figure 5.10. Percentage distribution of accidents in Indonesia: 2011-2021 (Source: Arcsilea)

Geographic distribution of waterways accidents

Indonesia is an archipelagic country with 17,500 islands; therefore, transportation plays a significant role in connecting people and moving goods between islands[88]. 54% of accidents in the database occurred on routes in the Java, Sulawesi, and Kalimantan Island sea areas, where there is relatively higher domestic transport traffic compared with other areas. An overview of the accident-prone routes with their geographic distribution is presented in Table 5.3.

[85] Mutmainnah, W., Bowo, L. P., Nurwahyudy, A., Prasetyo, F. A., & Furusho, M. (2020, August). Causative factor analysis of passenger ship accident (Fire/Explosion) in Indonesia. In IOP Conference Series: Earth and Environmental Science, Vol. 557, No. 1, p.012037.

[86] Gelling, P. (2009). Indonesia: 250 Feared Dead in Aftermath of Ferry Accident. The New York Times, 158(54554), A9-L. https://www.nytimes.com/2009/01/13/world/asia/13briefs-250FEAREDDEA_BRF.html

[87] Bowo, L. P., Furusho, M., and Kurniawan, M. A. (2019). A Causal Study of Indonesian Sinar Bangun Ferry Accident by HEART Methodology. Navigation, 207, 34-35.

[88] Heryandri, K. (2018). The Importance of Ferry Ro-Ro Transportation in Indonesia and Its Contrary to The Lack of Attention on Ferry Ro-Ro Safety, Which Cause High Rate of Accidents and Fatalities. Advances in Transportation and Logistics Research, 1, 641-651.

Table 5.3. Geographic distribution of waterways accidents in Indonesia by routes: 2011-2021

Location	Accident prone area
Java Island	East Java Routes to Sumenep Surabaya River Routes Off Masalembu Lamong Bay Tanjung Perak Port Bengawan Solo River Surabaya to Balikpapan Cimanuk River Routes
Sulawesi Island	Molucca Routes (Tibelo-Bitung) Off Bangggai Laut Bajoe-Kolaka Makassar-Barrang Lompo Bira-Pamatata Kendari-Salabangka
Kalimantan Island	Routes to/from Central Kalimantan Bontang-Sulawesi Tarakan-Tanjung Selor Tanjung Dewa Routes Buntut Gurung River (West Kalimantan)
Papua Province	Lake Sentani Routes Biak-Numfor Mamberamo River Routes
Sumatra Island	Lake Toba Routes Musi River Routes
Other locations	Malacca Strait Bali Strait Sunda Strait Java and South Kalimantan Island Routes Routes to/from Thousand Islands Gunungsitoli-Sibolga Alas Strait Routes to/from Riau Islands Ambon-Namrole Lombok-Komodo Routes

When examined in terms of frequency, Malacca, Sunda, Bali, and Alas Straits are more accident-prone, accounting for 17% of the accidents found in the database. This is attributable to the high density of domestic and international traffic in these important waterways. The percentage distribution of accidents in Indonesian waters is presented in Figure 5.11.

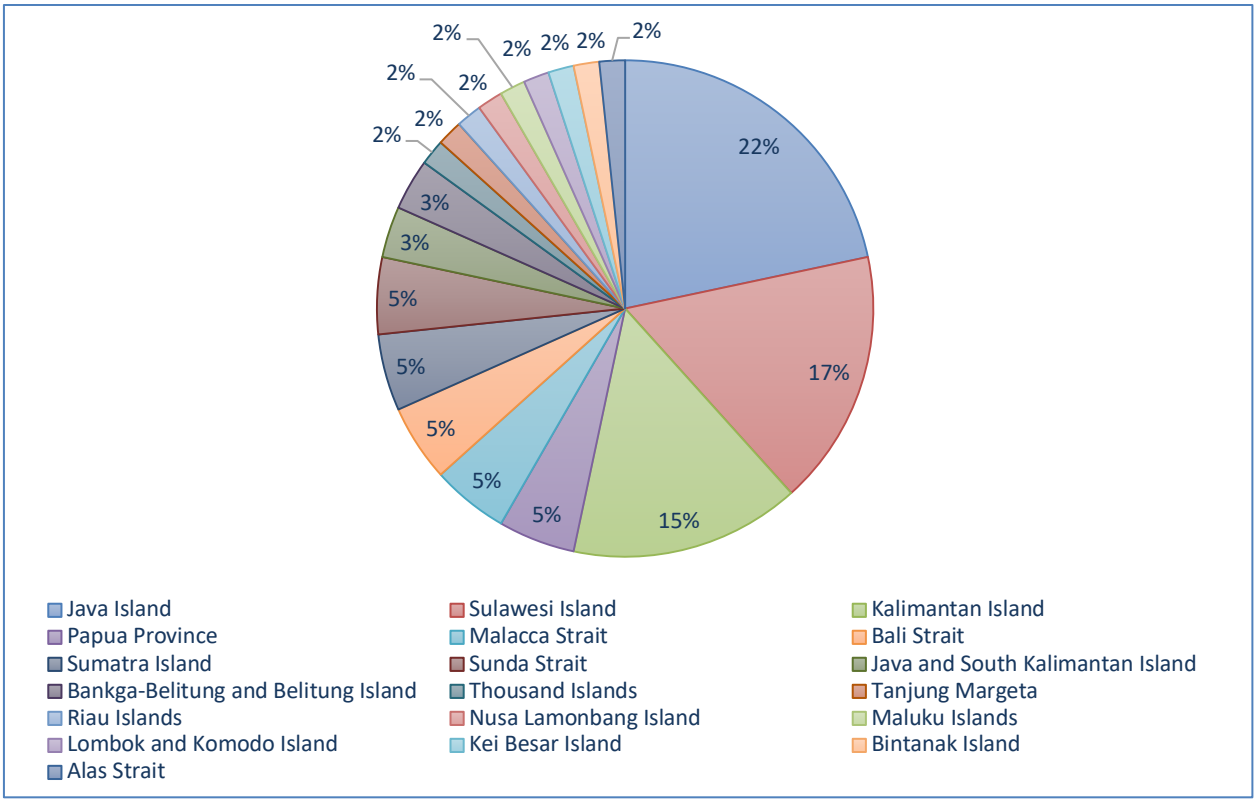


Figure 5.11. Geographic distribution of accidents in Indonesia by frequency: 2011-2021 (Source: Arcsilea)

6 NIGERIA

6.1 General information and characteristics of Nigeria

Geography

Nigeria, officially the Federal Republic of Nigeria, is located on Africa's western coast, along the Gulf of Guinea, just north of the equator and covers an area of 923,768 square kilometres[89]. It shares land borders with Benin, Niger, Chad, and Cameroon and maritime boundaries with Benin and Cameroon (Figure 6.1).

Hinterland, the Niger and Benue Rivers constitute the country's major geographical features. The two rivers meet in the middle of Nigeria, creating a "Y" that divides the country into three broad areas. After flowing 4,000 km from the Guinean Highlands through West Africa, the Niger reaches the Gulf of Guinea in Nigeria, forming a sizeable coastal delta with mangrove and swamp forests. The Niger Delta is a hotspot for plant and animal species. It also holds Africa's second most significant oil and natural gas reserves, which drive Nigeria's economy, the largest in Africa by nominal GDP of 440,776,971 USD in 2021[90].

Figure 6.1. Map of Nigeria (Source: World Atlas, 2022)

[89] Nigeria High Commission. (2022). Key Data. https://www.nigeriahc.org.uk/about-nigeria

[90] The World Bank. (2021). GDP (US$)–Nigeria 2021 https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=NG

Demographics

Nigeria is the most populous nation in West Africa and currently ranks seventh in the world in population, with over 217 million[91]. Nigeria's urban nature is unique in Africa, with 11 cities with over 1 million residents and over 70 with over 100,000[92].

English coexists alongside the hundreds of languages spoken in the country including, Yoruba, Igbo, Fula, Hausa, Edo, Ibibio, and Tiv[93]. English is the ordinary and official language for administration and education.

Political

In addition to demographic, Nigeria is the key political and economic country on the African continent.

It has been over sixty years since Nigeria attained the status of a sovereign nation. However, in terms of political stability, the county has had a long history of coups d'états, military rule, and dictatorship[94].

Thirty-six states make up the Federal Republic. The national capital is Abuja, in the Federal Capital Territory, created by a decree in 1976. Abuja is located in the centre of the country. Lagos, situated in the coastal belt, is the former capital and retains its standing as the country's leading commercial and industrial city[95].

[91] Worldometers. (2022). Nigeria Population (Live). https://www.worldometers.info/world-population/nigeria-population/

[92] Atlas Editorial and Production Team. (2022). West Africa: Land Use and Land Cover Dynamics, The Republic of Nigeria. https://eros.usgs.gov/westafrica/country/republic-nigeria

[93] Britannica. (2022). Languages of Nigeria. https://www.britannica.com/place/Nigeria/Languages

[94] Etebom, J. M. (2021). The Long Years of Military Rule in Nigeria: A Blessing or a Curse. Journal of Public Administration and Governance. 11(2), 71-86. https://www.macrothink.org/journal/index.php/jpag/article/view/18355/pdf

[95] Britannica. (2022). Nigeria, introduction and quick facts. https://www.britannica.com/place/Nigeria

Nigeria has two legislative bodies. The President acts as both, the Head of State and Head of Government. Under the current constitution, presidential elections are to be held every four years, with no president serving more than two terms in office.

Three tiers comprise the government structure in Nigeria – the Executive, Legislature, and Judiciary[96].

At the national level, the Executive consists of the Presidency and the Federal Executive Council. The Legislature includes the Senate and House of Representatives with legislators elected to four-year terms. The judicial branch is presided over by the Chief Justice of Nigeria in the Supreme Court of Nigeria[97].

At the state level, replicating the three levels, the Executive comprises the Governor, the Deputy Governor, and the State Executive Council while the Legislature consists of the State House of Assembly, and the Judiciary includes several Courts of Justice.

Economy

Nigeria is a key economic player in Africa and has significant economic potential. The country has a developing mixed economy mainly based on petroleum production and agriculture while manufacturing is also growing in importance. Nigeria is Africa's largest oil producer and among the top ten producers worldwide. The country is characterized by a dynamic economy and a high economic growth of about 6-7% a year[98]. As a result, Nigeria is considered a future economic power that has the potential to be among the world's ten largest economies. However, most Nigerian appear to have somewhat low income, with more than 40% of the population living below the UN poverty line[99].

[96] Federal Republic of Nigeria. (2022). Government. https://nigeria.gov.ng/

[97] Legit. (2022). The three arms of government in Nigeria and their functions. https://www.legit.ng/1148362-the-arms-government-nigeria-functions.html

[98] Ministry of Foreign Affairs of Denmark. (2022). Denmark in Nigeria, About Nigeria. https://nigeria.um.dk/en/

[99] The World Bank. (2022). Deep Structural Reforms Guided by Evidence Are Urgently Needed to Lift Millions of Nigerians Out of Poverty, says New World Bank Report. https://www.worldbank.org/en/news/press-

6.2 Maritime profile of Nigeria

Shipping

The shipping industry is one of the most promising industries for growth in Nigeria[100]. With a coastline of more than 850 kilometres, a maritime area of 46,000 square kilometres, a vast inland waterways resource estimated at nearly 4,000 kilometres, and more than 70% of Nigerian trade by value being transported by water, the significance of the blue economy and maritime transport for trade and development in Nigeria cannot be overstated. Furthermore, Nigeria's total annual freight cost, estimated at between USD 5 billion and USD 6 billion annually, places shipping at the heart of Nigeria's economic growth. Maritime trade has played a vital role in Nigeria's economic development. Although the GDP share of water transport is only 1.6%, it holds significant importance, accounting for about 95% of Nigeria's international trade[101]. Figure 6.2 presents select statistics about the maritime profile of Nigeria.

Figure 6.2. Maritime profile of Nigeria (UNCTAD, 2021)

release/2022/03/21/afw-deep-structural-reforms-guided-by-evidence-are-urgently-needed-to-lift-millions-of-nigerians-out-of-poverty

[100] Nze, I. C., & Okeudo, G. N. (2013). Empirical evaluation of the maritime industry's impact on the Nigerian economy. International Journal of Current Research, 5(6), 1355-1359. https://www.journalcra.com/sites/default/files/issue-pdf/Download%203301.pdf

[101] Atoyebi, O. M. (2022). A Comprehensive Analysis of The Challenges and Prospects in The Nigerian Maritime/Shipping Industry. https://omaplex.com.ng/the-nigerian-maritime-shipping-industry-its-challenges-and-prospects-and-implications-for-foreign-investment/

Inland water transportation

With 10,000 kilometres of navigable inland waterways and 850 kilometres of coastline, Nigeria has great potential for the transportation of passengers and goods over inland waterways. The inland waterways are dominated by the Niger and Benue rivers, which split the country into the East, West, and Northern regions, and then converge and run into the Atlantic Ocean.

According to statistics from the National Inland Waterways Authority (NIWA)[102], the Niger and Benue rivers together make 28 of the 36 states of the Federation and five neighbouring countries on the continent (i.e., Benin Republic, Equatorial Guinea, Cameroon, Chad, and Niger) reachable by inland waterways through water transport.

Inland Water Transportation (IWT) is vital and critical for all facets of development in these regions, including agricultural productivity performance, since the areas adjacent to the navigable rivers represent the most important agricultural and mining regions in the country. Thus, for instance, agricultural products from the central belt regions can be carried through the waterways to the deltaic regions, and vice versa. The cargo movement over waterways also facilitates the import and export of raw materials and mining products.

IWT plays a significant role in rural development and brings benefits to the community, especially in Lagos, Rivers, Bayelsa, and Akwa Ibom. Its usage to carry goods and services boosts the economic growth and rural development of coastal cities, especially when it is the only available option.

As stated by a NIWA official, “IWT forms an integral part of the region’s social fabric. It plays a pivotal role in assisting the people, especially the poor, in gaining access to social services and

[102] The National Inland Waterways Authority (NIWA) was set up in 1956 by Decree No. 13 of 1997. As a Federal government statutory body, with head office at Lokoja and thirteen area offices across the country, the mission and objectives among others include; to provide regulation, economical and operational leadership in the nations inland waterways system ; develop infrastructural facilities for efficient international transportation system in line with global best practice; improve and develop the inland waterways for navigation; provide alternative mode of transportation for evacuation of economic goods and persons ; and execute the objective of Transport especially as it concerns inland waterways.

employment opportunities and benefiting from the nation's economic agenda." Indeed, IWT helps all sectors in Nigeria, including mining, fishing, basic materials manufacturing, forest products processing, rural development, etc., notably in the coastal states. NIWA estimates that IWT directly employs approximately 125,000 people in total in all of the Nigeria's deltaic states.

Besides the creeks, the current navigable inland waters in Nigeria include the Niger River, Benue River, Ogun River, and Anambra River. Figure 6.3 depicts Nigeria's navigable inland waters (rivers and creeks). The overall navigable river length has increased from fewer than 8,000 kilometres in 1970 to more than 10,800 kilometres, mainly due to dredging on the lower Niger River and channelizing of the Ogun, Anambra, and Benue Rivers[103]. While in the 1980s, the Niger River was navigable only until Jebba, improvements at Kainji have now made it possible for lighter vessels to cruise in the rivers.

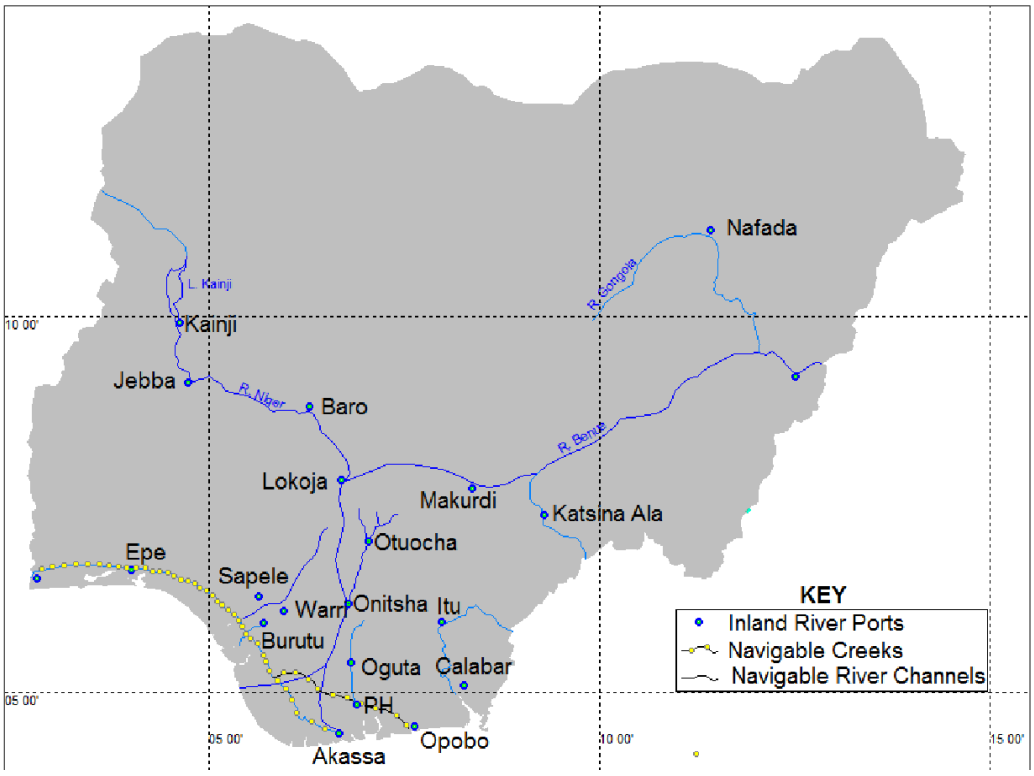


Figure 6.3. Inland river ports in Nigeria (NIWA, 2012; Chukwuma, 2014)

[103] Chukwuma, O. M. (2014). The characteristics of inland water transport in Nigeria. IOSR Journal of Humanities. 19(3), 119-126. https://www.iosrjournals.org/iosr-jhss/papers/Vol19-issue3/Version-4/V01934119126.pdf

Passenger transportation in inland waters

Inland water transport in Nigeria contributes to the mobility of a considerable number of passengers between the different States reachable through waterways. Lagos area, in particular, is host to major passenger domestic ferry routes and services. Lagoons and rivers comprise seventeen percent of Lagos State, thus, making it well-suited for water transport. The central water bodies of Lagos State are the Lagos Lagoon, Ologe Lagoon, Porto-Novo Creek, Badagry Creeks, and the Atlantic Ocean. As stated by the General Manager of LASWA, "IWT is an integral part of Lagos' inter-modal transport system, having the least influence on the environment, the lowest cost for city travel, massive capacity reserves, and the least energy use."

A study conducted in 2020[104] reported that almost 3,000 passengers are transported by water per day along the route axis of Lagos State from Ikorodu to Ebutte-Ero. The study revealed that Lagos State operates twelve ferry routes under the supervision of the Lagos State Water Authority (LASWA)[105]. The routes in the Snake Island-Badagry Creek area and a cross-section of the ferry routes in the Lagos area are presented in Figures 6.4 and 6.5 respectively, and Table 6.1 lists all the ferry routes in Lagos supervised by LASWA.

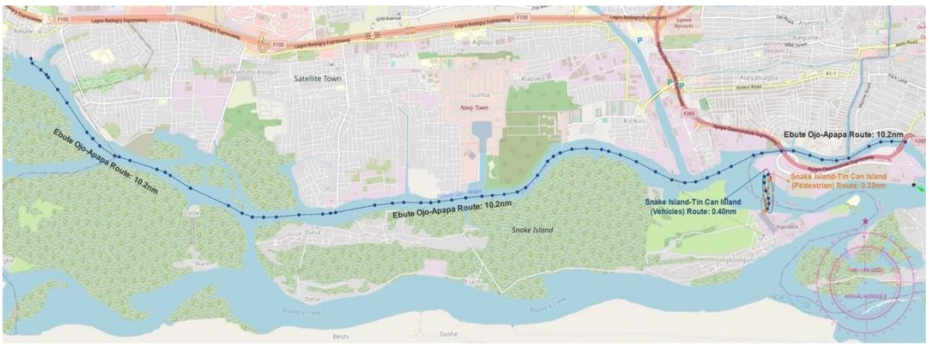


Figure 6.4. Example of ferry routes in Snake Island-Badagry Creek area (copyright authors)

[104] Abdulkadir, U. B., & Halimat, A. K. (2020). Inland Water Transport and Urban Mobility in Ikorodu-Ebutte Ero Route, Lagos, Nigeria. *Geosfera Indonesia, 5(1)*, 127-146.

[105] The Lagos Waterways Authority (LASWA) was enacted by The Lagos State Government (LASG) in 2008 under Lagos State Waterways Authority Act. LASWA is charged with the responsibility of coordinating and managing the reforms necessary for the long-term growth and development of water transportation in Lagos State, including the granting of ferry licenses and concessions for the operation of terminals to the private sector. The fundamental responsibility of LASWA is to manage, improve and enhance navigation opportunities for Lagos State inland waterways.

Figure 6.5. Example of domestic ferry routes in the Lagos lagoon area (copyright authors)

Table 6.1. Ferry routes in Lagos under the supervision of LASWA

1.	Ikorodu-Marina/CMS
2.	Marina-Mile 2
3.	Ikorodu-Addax/Falomo
4.	Ikorodu-EbuteEro
5.	Marina-IjegunEgba-EbuteOjo
6.	Mile 2-Marina/CMS-Mekwen-Falomo
7.	Badore Ijede
8.	Badore-Five Cowries
9.	Marina-Oworonshonki
10.	EbuteOjo-IjegunEgba
11.	Oworonshonki-Five Cowries
12.	Baiyeku-Langbasa
13.	Lagos-Onitsha
14.	Lagos-Badagry

Consultation with relevant participants in the interviews revealed that apart from the few regular ferry services operating between Lagos Island and the mainland, fiberglass motorized boats and canoes are widely used to transport passengers on the lagoon areas and some of the creeks. Participants emphasized that speed is the main reason for the passengers' preference for fiberglass motorized vessels. In contrast, ferries are desired by other passengers due to their

safety and better comfort when compared to the other available vessels. Furthermore, it was discerned from interviews that the users of the domestic ferry transport system in Lagos are primarily workers; because Lagos is regarded as the city with the highest road traffic congestion in Nigeria, and travelling by water for at least part of the trip allows the users, particularly workers, to avoid traffic congestion and reduce time as well as the cost of daily travel.

6.3 Maritime regulatory framework in Nigeria

General overview of maritime regulators and regulations

The key players in the governance of the maritime industry in Nigeria are the Nigerian Ports Authority (NPA), National Inland Waterways Authority (NIWA), Nigerian Shippers Council (NSC), Nigerian Maritime Administration and Safety Agency (NIMASA), and Council for the Regulation of Freight Forwarding in Nigeria (COREFFN). In addition, to assisting with implementing IMO and ILO regulations on maritime safety and environmental protection, these organizations also take part in the process of developing the regulatory instruments by actively participating in the activities of the relevant committees and subcommittees of the two United Nations agencies[106].

Various regulatory frameworks have been established to govern Nigeria's maritime activities and practices. The following are among the applicable laws:

- Admiralty Jurisdiction Act, 1991;
- Nigerian Maritime Administration and Safety Agency (NIMASA) Act, 2007;[107]
- Coastal and Inland Shipping (Cabotage) Act, 2003;[108]
- Nigerian Ports Authority (NPA) Act; [109]

[106] Igwe, I. S., Inyangsam, A. U., & Ajoko, T. J. (2019). Role of the Shipping Industry in the Maritime Regulatory Process: Case for Nigeria. International Journal of Engineering Science, 20061.

[107] Nigerian Maritime Administration and Safety Agency (NIMASA) Act 2007 established NIMASA and charged it with the responsibility to promote the development of shipping and regulating issues affecting Merchant ships and Seafarers in Nigeria.

[108] The objective of the Cabotage Act is to reserve the commercial transportation of goods and services within Nigerian coastal and inland waters to vessels flying the Nigerian flag and owned by Nigerian citizens.

[109] Nigerian Ports Authority (NPA) Act empowers the NPA to maintain, improve and regulate the use of the ports; ensure the efficient management of port operations; provide and operate ports facilities; form and establish or incorporate subsidiaries or affiliate companies for purpose of carrying out any of its functions.

- Merchant Shipping Act, 2007; [110] and
- Finance Act, 2021. [111]

Along with the said acts, there is a raft of published regulations and guidelines which are used to implement international instruments under the foregoing legislation.

As regards the international conventions, Nigeria has ratified forty conventions adopted at the International Maritime Organisation (IMO) and International Labour Organisation (ILO) of which nineteen have been domesticated in its jurisdiction either by adoption, regulations, or incorporation under the Merchant Shipping Act, 2007.

In addition, areas such as ports, maritime cargo transport, shipwrecks and salvage, pollution, the environment, and marine resources are also governed by specific legislation as follows:

- Nigeria Ports Authority Act, 2004;[112]
- Carriage of Goods by Sea Act of Nigeria, 2004;[113, 114] and
- United Nations Convention on Carriage of Goods by Sea (Ratification and Enforcement) Act, 2005[115].

The Constitution of the Federal Republic of Nigeria, 1999 (as amended), the Admiralty Jurisdiction Act and the Admiralty Jurisdiction Procedure Rules, 2011 provide the framework for admiralty jurisdiction and court practice.

[110] Merchant Shipping Act, 2007 provides for Merchant shipping in Nigeria and allows only registered Nigerian ships to operate commercially to the exclusion of others, except for statutory exempted cases.

[111] The Finance Act regulates taxation of companies, including companies involved in the maritime business.

[112] Nigerian Ports Authority Act. (2004). http://www.placng.org/lawsofnigeria/laws/N126.pdf

[113] Lexology. (2018). Carriage of goods by sea in Nigeria. https://www.lexology.com/library/

[114] Anike, N. B., Odoh, J. C., & Nwoke, U. (2020). Concurrent application of the Hague and Hamburg rules: ascertaining the applicable law to contracts for the carriage of goods by sea in Nigeria. Commonwealth Law Bulletin, 46(2), 195-214.

[115] United Nations Convention on Carriage of Goods by Sea (Ratification and Enforcement) Act. (2005). http://placng.org/lawsofnigeria/laws/

A non-exhaustive list of maritime regulations[116] in Nigeria is presented in Table 6.2.

Table 6.2. Non-exhaustive list of maritime regulations in Nigeria [117]

Legislation	Date of original text	Last revised
Merchant Shipping Act, 2007	28 May 2007	18 February 2013
Nigerian Maritime Administration and Safety Agency Act	25 May 2007	21 February 2013
Ports (Related Offences, etc.) Act, 1996	19 April 1996	1 January 2003
Maritime Operations Co-ordinating Board Act	24 November 1992	18 February 2013
Coastal and Inland Shipping (Cabotage) Act,2003 (No. 5 of 2003)	30 April 2003	April 2007
Admiralty Jurisdiction Act, 1991 (No. 59 of 1991)	30 December 1991	-
Nigerian Ports Authority Act, 1999 (No. 38 of 1999)	10 May 1999	21 February 2013
National Inland Waterways Authority Act, 1997 (No. 13 of 1997)	12 August 1997	21 February 2013
Exclusive Economic Zone Act (Cap. T.5)	02 October 1978	14 February 2013
Lagos State Waterways Authority Law	21 July 2008	-
Lagos Port Operations (Special Provisions) Act	23 January 1971	18 February 2013
Flags of Nigerian Ships Act	14 May 1968	14 February 2013
Territorial Waters Act	08 April 1967	28 February 2013
Marine Insurance Act	01 April 1961	18 February 2013
Oil in Navigable Waters Act	22 April 1968	28 February 2013
Oil in Navigable Waters Regulations	22 April 1968	25 February 2013
National Oil Spill Detection and Response Agency Act, 2006 (No. 15 of 2006)	18 October 2006	-
Ports (Carbide of Calcium) Regulations	14 February 1963	21 February 2013
Nigerian Ports Authority Docks and Premises Bye-laws	22 December 1955	21 February 2013

[116] Policy and Legal Advocacy Center (PLAC). (2022). The Complete 2004 Laws of Nigeria. A Searchable Compendium. https://placng.org/lawsofnigeria/.

[117] FAOLEX Database. (2022). Nigeria-Sea-See more. https://www.fao.org/faolex/country-profiles/general-profile/see-more/en/

Nigerian Ports Authority (Port) Regulations	1955	21 February 2013
Crude Oil (Transportation and Shipment) Regulations (S.I. 44 of 1984)	03 December 1984	-
International Convention for the Prevention of Pollution from Ships 1973 and the 1978 Protocol (Ratification and Enforcement) Act, 2007 (No. 54 of 2007)	01 April 2007	-
Territorial Waters (Amendment) Decree 1998	01 January 1998	-
Territorial Waters (Amendment) Decree 1971 (Decree No. 38)	26 August 1971	-

Initiatives are currently underway to revolutionize the Nigerian maritime industry and bring about significant reform. Consequently, several bills are under active consideration of the House of Representatives of the National Assembly (lower legislative chambers of Nigeria), as enumerated in Table 6.3. These Bills are expected to bring significant changes to the maritime industry in Nigeria. Thus, the legislative chambers have carefully considered these Bills and look forward to enacting them into law.

Table 6.3. Bills under active consideration of the House of Representatives of the National Assembly of Nigeria

- the Merchant Shipping Act (Repeal and Re-enactment) Bill, 2021;
- the Coastal and Inland Shipping (Cabotage) Act Amendment Bill, 2020;
- the Nigerian Maritime Administration and Safety Agency Bill, 2022; and
- the Maritime Development Bank Bill, 2019.

Governance of inland water transport

The Government of Nigeria maintains superintendence and regulates inland water transport through the ministry of transport. The ministry maintains the waterways and is responsible for regular dredging, wreck removal, and clearing of channels. It also constructs and maintains ports, jetties, and embarkation, and disembarkation points. The federal ministry of transport conducts

its duties through NIWA[118] and NIMASA[119], whereas in the state of Lagos, inland water transport is administered concurrently by LASWA[120]. A brief description of each agency ensues.

National Inland Waterways Authority

NIWA was formerly the Inland Waterways Department, the oldest operational department in the Ministry of Transport from 1956 to late 1997[121]. However, in 1997, it was elevated to a full Authority by the National Inland Waterways Decree of 1997 and commenced operations fully in 1998. NIWA is a statutory body within the Federal Ministry of Transport of Nigeria.

Figure 6.6. NIWA commits to ending accidents on Lagos waterways
(Source: The Guardian, August 3, 2022)

NIWA has the exclusive authority to oversee, guide, and monitor the whole of the waterways within the Nigerian territory. Its objectives include planning for safety and security on the waterways besides implementation of rules and regulations. Specifically, the main objectives assigned to NIWA by the decree are presented in Table 6.4.

[118] The National Inland Waterways Authority (NIWA). Web page: https://niwa.gov.ng/

[119] The Nigerian Maritime Administration and Safety Agency (NIMASA). Web page: https://nimasa.gov.ng/

[120] The Lagos Waterways Authority (LASWA). Web page: https://lagoswaterways.com/

[121] Bello-Olowookere, G. B. (2011). *The effects of cabotage regime on indigenous shipping in Nigeria*. Master's Thesis. World Maritime University, Malmo, Sweden.

Table 6.4. Main objectives of NIWA [122]

- to encourage and grow private sector venture and involvement in the running and control of the resources of the National Inland Waterways Authority;
- to plan for the safety and security guidelines of the National Inland Waterways;
- to plan a substitute means of carriage for the movement of commodities and people; and
- to put in practice the National Transport rules as it concerns the National Inland Waterways in Nigeria.

The services provided by NIWA in fulfilment of its statutory objectives include regulatory, transport, engineering, marine, and survey services. NIWA has its Headquarters at Lokoja, Kogi State and a Liaison Office at Maritime House, Abuja. NIWA conducts its administration of IWT and provision of services through twenty-two area offices strategically located across the country, led by Area Managers.

Nigeria Maritime Administration and Safety Agency

The Nigerian Maritime Administration and Safety Agency (NIMASA) was formed on 1 August 2006 by the National Maritime Authority and Joint Maritime Labour Industrial Council, the former parastatals of the Federal Ministry of Transport. It was established under the Nigerian Maritime Administration and Safety Agency Act, 2007. As per Section 3 of the Act, NIMASA is the apex regulatory agency responsible for executing the provisions of the Act.

[122] NIWA. (2022). Our Objectives. https://niwa.gov.ng/

Figure 6.7. The NIMASA Headquarters in Lagos (Source: NIMASA website)

Section 22 of the NIMASA Act specifies a broad range of functions for the Agency as highlighted in Table 6.5.

Table 6.5. Functions of NIMASA.[123]

- To administer the registration and licensing of ships;
- To pursue the development of shipping and regulatory matters relating to merchant shipping and seafarers;
- To regulate and issue the certification of seafarers;
- To establish maritime training and safety standards;
- To control the safety of shipping as regards the construction of ships and navigation.
- To provide search and rescue services;
- To provide directions and ensure compliance with vessel security measures;
- To carry out air and coastal surveillance;
- To control and prevent marine pollution; and
- To provide the direction on qualification, certification, employment, and welfare of maritime.

[123] NIMASA. (2022). Corporate Information. https://nimasa.gov.ng/about-us/corporate-information/

The provisions of the NIMASA Act apply to all ships registered in Nigeria, as well as ships, small ships, and vessels flying a foreign flag within the exclusive economic zone, territorial and inland waterways, and ports of the Federal Republic of Nigeria.

In addition to NIMASA Act, NIMASA is also assigned the obligation of regulating the maritime industry in Nigeria through the Merchant Shipping Act, 2007 and the Coastal and Inland Shipping (Cabotage) Act, 2003. Accordingly, NIMASA aims to promote the development of indigenous commercial shipping in the international and coastal waters by fostering maritime safety and security and protecting the marine environment.

Lagos State Waterways Authority

The Lagos State Waterways Authority (LASWA) was established by the Lagos State Government in 2008 through the Lagos State Waterways Authority Act. This Act charged LASWA with coordinating and administering the reforms required for the long-term development of water transportation in Lagos State, including issuing ferry licenses and concessions for the operation of terminals. These reforms entail the creation of an enabling, long-term regulatory environment that encourages substantial private sector participation in the supply of water transport services. Through LASWA, the Lagos State Government has initiated policy reforms that inspire and enable investments for the provision of water transport, intending to realize its potential to become an appealing mode of transportation. LASWA's primary role is to manage, improve, and expand the navigability of Lagos State's inland waterways.

Figure 6.8. A stakeholder meeting of LASWA in progress (Source: LASWA website)

The specific responsibilities of LASWA within the Lagos State area are enumerated at Table 6.6. In order to make the state's waterways safer, one of the most important initiatives that has been initiated by LASWA and Lagos State Government recently and is still in the process is the Inland Waterways Safety Code.

Table 6.6. Responsibilities of LASWA [124]

- establishing, maintaining, and regulating the operation of vessels, carriers, pilot boats, ferries, lines, and regular ferry services in Lagos state;
- controlling the use of internal waterways by all users, including private and common carriers;
- engaging into contracts for the maintenance, exploration, superintendence, management, and transit of all state and internal waterways and terminals, platforms, piers, and jetties with any other person(s), authority, company, or other private operators;
- instigating and collecting water transportation tolls, rates and charges; and
- clearing and maintaining Lagos State Inland waterways free from all obstructions, derelicts, wrecks, and abandoned properties and installing route buoys gauges, distance boards, and markings along the inland waterways of Lagos State.

6.4 Domestic ferry accidents in Nigeria[125]

Trends in accidents

The trends in number of casualties are considered to be amongst the foremost indicators of the level of safety, especially from the system perspective. In Nigeria, the study revealed that the annual number of reported fatal accidents increased from 2011 (1 accident) to 2018 (8 accidents) (Figure 6.9[126]). We would, however, like to treat this increasing trend with positive caution and attribute it to a possible progressively improving reporting culture in respect of unsafe events in

[124] LASWA. (2022). About us. https://lagoswaterways.com/about-us

[125] This section of the report is based on statistics drawn from the Arcsilea database.

[126] The significantly higher than average number of accidents in 2017 and 2018 would merit further consideration which is beyond the scope of the study.

the country. This positive improvement in reporting also points to a likelihood of better uptake of any safety intervention which may be justifiable on the basis of an increasing trend in the number of accidents among other factors.

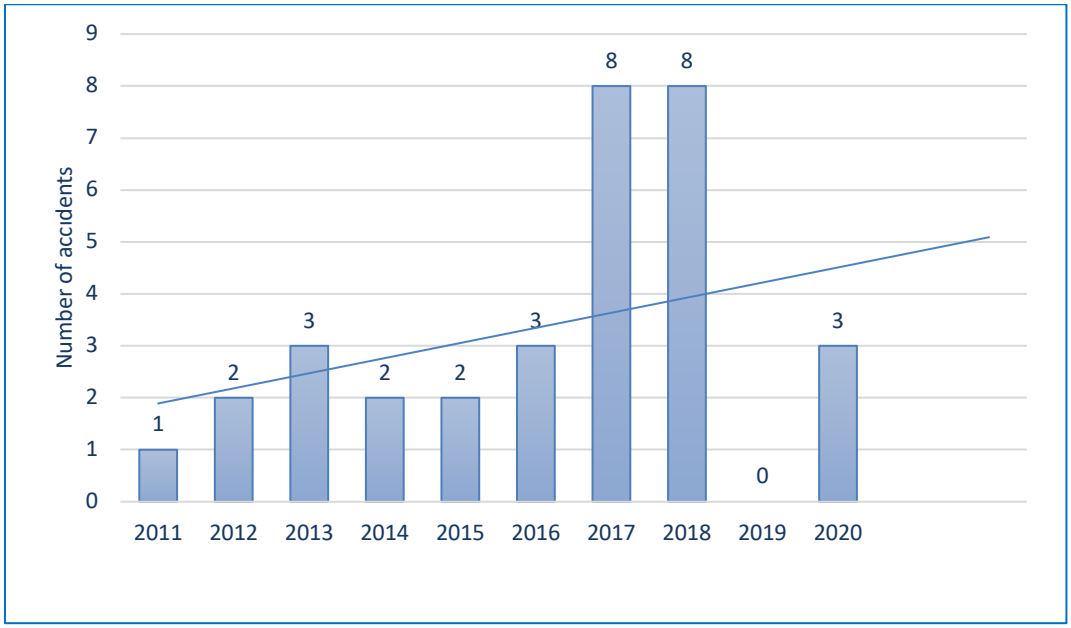


Figure 6.9. Trend of accidents in Nigeria: 2011-2021 (Source: Arcsilea)

Causal factors of accidents

Nigeria experienced 32 accidents in the last decade that resulted in 841 fatalities. The study revealed that capsizing and allision followed by sinking represented 78% of the total accidents (Figure 6.10). The sinking of the vessel consequent to any collision or allision also highlighted the extreme vulnerability of the Nigerian vessels to any damage that may be sustained even when operating in inland waters.

Among the causes of accidents frequently cited in the literature include: night operations (80% of the accidents are during night movements), inadequate enforcement and compliance with safety regulations, unqualified and unregistered boat operators, inadequate safety/security

personnel at the jetties and terminals, inadequate infrastructure, and lack of dredging[127, 128]. In addition, a lack of safety and security awareness among passengers was emphasized as an important factor that causes accidents resulting in more severe consequences[129].

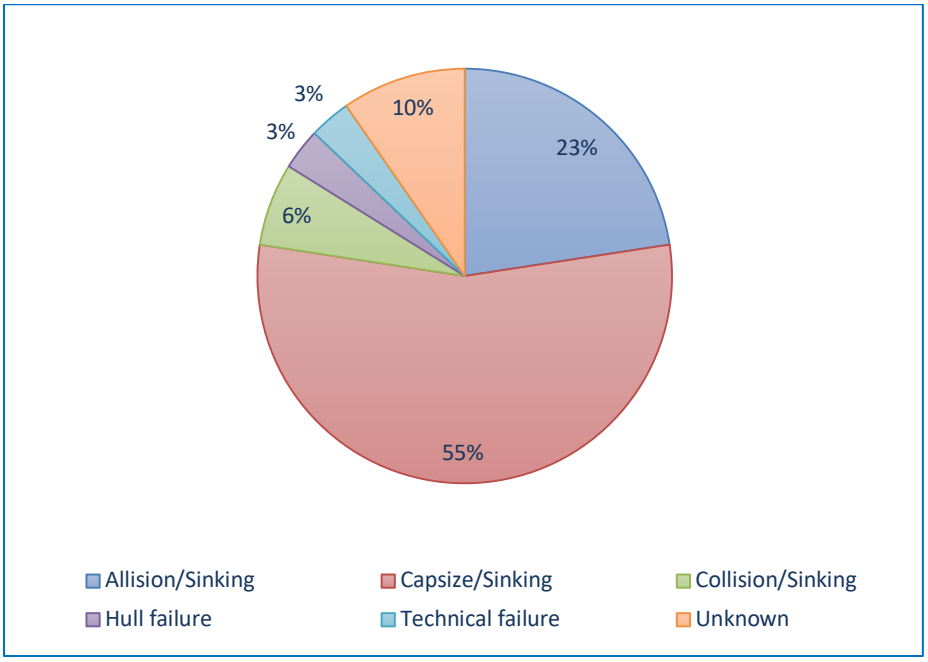


Figure 6.10. Percentage distribution of accidents in Nigeria: 2011-2021 (Source: Arcsilea)

Geographic distribution of waterways accidents

Several different factors would determine the geographic distribution of accidents, including traffic density, proximity to passing vessels, weather conditions, type of vessel, navigational hazards, etc. A critical understanding of the determinants is an essential prerequisite to planning any measures or safety interventions to make the risk as low as reasonably practicable.

[127] Abiodun, S. (2021a). Safety and Security of Ferry Passengers' Lives at Night at Ebute Ero, Marina and Mekuen, Lagos State. International Journal of Research Publication and Reviews. 2(9), 1188-1193.

[128] Hart, E. C., Adebiyi, S. O., & Oyenuga, O. G. (2020). Prioritisation of Ferry Commuters' needs in Lagos Metropolis: An Analytical Hierarchical Process Approach. Scientific Journal of Silesian University of Technology. Series Transport. 2020, 107, 53-71.

[129] Abiodun, S. (2021b). Safety and economic impacts of operating passenger boats without proper life jackets and other lifesaving appliances in Lagos. International Journal of Research Publication and Reviews, 2(8), 901-908.

Lagos, with its highest traffic density in the country, accounted for over 40% of the total casualties, and together with Niger, Kebbi and Benue (all three in roughly equal proportion) accounted for about 75% of all the fatal accidents in Nigeria between 2011 and 2021. The percentage distribution of accidents across Nigeria is presented in Figure 6.11 and an overview of the geographic distribution is provided in Table 6.7.

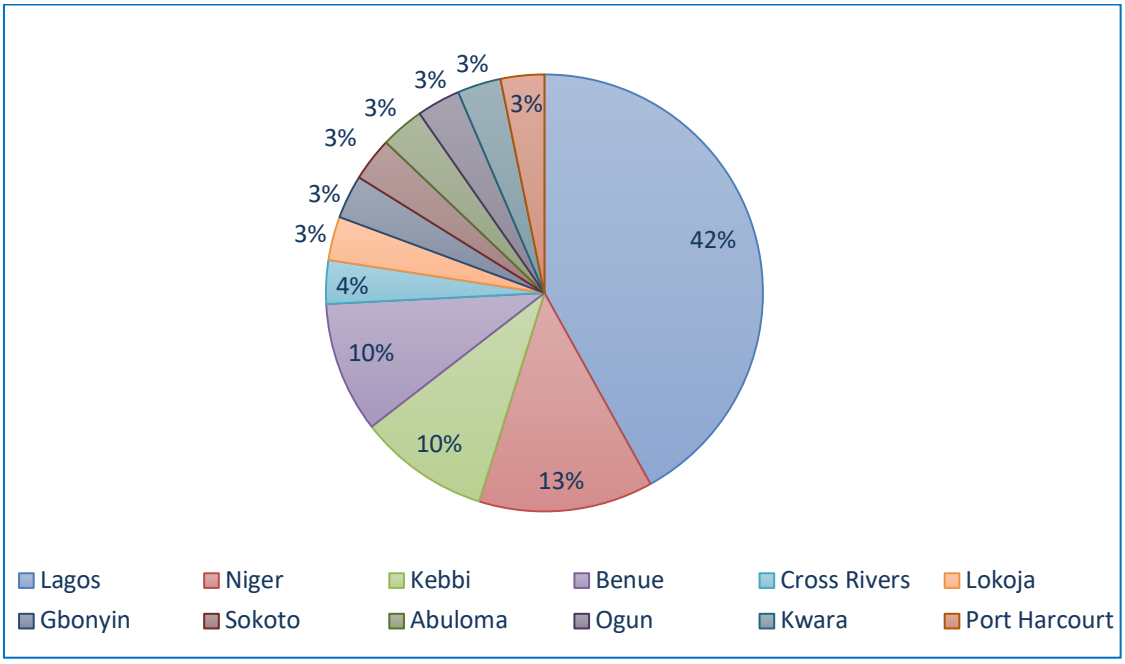


Figure 6.11. Percentage distribution of accidents in Nigeria by location: 2011-2021 (Source: Arcsilea)

Table 6.7. Geographic distribution of waterways accidents in Nigeria (State and respective accident-prone areas)

Lagos	Niger	Kebbi	Benue	Other areas
Lagos Lagoon	Niger River	Niger River	Buruku River	Eagle Island
Ebuto-Ero waterway	Kaduna River		River Gongola	Agatu River
Badagry waterway				Cross Rivers state
Port of Lagos				Egbe Dam Lake
River Ojo				Sokoto Strait
Ilashe Lagoon				Sokoto River
Imude Community Lagoon				Tafa River
Festac Town				

7 THE PHILIPPINES

7.1 General information and characteristics of the Philippines

Location and Geography

The Philippines is a Southeast Asian island country in the western Pacific close to the equator. It is an archipelago consisting of around 7,641 islands and with about 2,000 inhabited islands[130] (Figure 7.1).

The archipelago is divided into three major regions: Luzon to the north, named after the largest and northernmost island; Visayas, the central group of islands that includes the major islands of Panay, Negros, Cebu, Bohol, Leyte, Samar, and Masbate; and Mindanao to the south, named after the Philippines' second-largest island, located at the southern end of the archipelago. Manila is the capital, while Quezon City is the country's most-populous city. Both are in Luzon and part of the National Capital Region (Metro Manila).

The Philippines has 36,289 kilometres[131] of coastline and encompasses an area of 300,000 square kilometres. It is bordered by the South China Sea to the west, the Philippine Sea to the east, and the Celebes Sea to the southwest. The Philippines shares maritime borders with China, Taiwan, Japan, Palau, Indonesia, Malaysia, and Vietnam.

Demographics

With a population of 112 million and an annual growth rate of 1.3%, the Philippines is the thirteenth most populous nation in the world. Quezon City is the most populous with more than 2.7 million, followed by Manila with 1.6 million[132].

[130] National Mapping and Resource Information Authority (NAMRIA), 2017.

[131] World Atlas. (2020). Countries with the Longest Coastline.https://www.worldatlas.com/articles/countries-with-the-most-coastline.html.

[132] Worldometer. (2022). Philippines Population (LIVE). https://www.worldometers.info/world-population/philippines-population/.

Figure 7.1. The Philippines map (Sources: World Atlas, 2022)

Arabs, Japanese, Han Chinese, and Indians are among the population-forming ethnic groups in the Philippines. Tagalog and Cebuano are the most widely spoken indigenous languages. The two official languages are Filipino (updated Tagalog) and English, with the latter the predominant *lingua franca* in the Philippines for both, business and professions. Other indigenous languages include Ilokano, Hiligaynon, Waray, various Bikol languages, Kapampangan, Pangasinan, Maranao, Maguindanao, Kinaraya, Zamboangueño and Tausug. Catholicism and Islam are dominant religions in the country.

Political

The Philippines is a multi-party presidential republic whereby the President is both the Head of State and Head of Government, as provided by the 1987 Constitution of the Philippines. The President also serves as the Commander-in-Chief of all the armed forces of the Philippines. The President and Vice-President are elected for a six-year term by direct popular vote. The President is ineligible for re-election, while the Vice-President cannot serve more than two consecutive terms. The Vice-President assumes the presidency if the President resigns, is impeached, or dies in harness.

The politics of the Philippines take place within a three-branch governmental system. The President holds the executive powers, including, among others, the legal implementation in the country. The legislature is bicameral. The parliament (Congress) consists of a Senate - upper house, with 24 seats, whose members are elected by popular vote to serve renewable six-year terms, and a House of Representatives - lower house, with 304 seats, whose members serve three-year terms limited to three consecutive terms. The President can veto legislative acts, and a supermajority of legislators can override him. The judiciary branch is headed by the Supreme Court of the Philippines, a body with expansive powers of review over actions taken by other political and administrative bodies.

The Philippine legal system is a blend of civil law (Roman), common law (Anglo-American), Muslim (Islamic) law, and indigenous law, which makes it unique. The Philippines' legal system has significant religious influence. For instance, the Code of Muslim Personal Laws (Presidential Decree No. 1083), and special Courts, the Shari'a Courts, are enacted for Muslims.

The Constitution of 1987 specifies territorial and political subdivisions for the Philippines: provinces, cities, municipalities, and barangays. The provincial government consists of the governor, vice-governor, barangay members, and other appointed officials. Constitutionally, each territorial or political subdivision enjoys local autonomy. Local governments are under the supervision of the President.

Economy

The Philippines' economy is among the most dynamic in East Asia and the Pacific. The estimated 3.2% increase in GDP in 2021[133] was primarily attributable to rising private domestic consumption and fixed investment. The International Monetary Fund (IMF) anticipates that GDP growth will accelerate to 6.3% in 2022 and 7.0% in 2023. According to the IMF, the Philippines is the 32nd largest economy in the world by nominal GDP (USD 402.64 billion) in 2021 and the 12th largest economy in Asia.

[133] World Bank, 2021.

The agricultural sector contributed 10.1% of the GDP in 2020 and employed 22.8% of the labour force in 2019[134]. The Philippines is the second largest coconut producer worldwide. As for mining, the Philippines is one of the world's mineral-richest nations. Copper, gold, and zinc reserves in the Philippines are among the largest in the world.

The Philippines is regarded as a newly industrialized nation with an economy transitioning from the one based on agriculture to one based on services and manufacturing. The industrial sector contributes 28.3% to the GDP and employs 19.1% of the labour force. One of the Philippines' primary manufacturing activities is industrial food processing. The major industries are dominated by the production of cement, glass, chemical products and fertilizers, iron, steel, and refined petroleum products.

The Philippines' primary exports are semiconductors and electronic products, transport equipment, garments, copper products, petroleum products, coconut oil, and fruits.

7.2 Maritime profile of the Philippines

Shipping

The Philippines relies heavily on the maritime industry to achieve inclusive growth and socioeconomic development. Shipping remains the primary infrastructure connecting the Philippines archipelago. Additionally, it links the country to global commerce and trade. Figure 7.2 presents the maritime profile of the Philippines, according to UNCTAD Statistics.

Figure 7.2. Maritime profile of the Philippines (UNCTAD, 2021)

[134] World Bank, 2021.

The Philippine shipping industry has two distinct sides. On the one hand, the Philippines has a flourishing domestic shipping industry as an archipelagic country with over 7,000 islands. The Philippine domestic fleet comprises more than 12,000 registered vessels[135] that transport people and goods across the archipelago, contributing to developing the country's economy. On the other hand, the Philippines plays a significant role in international shipping as the leading provider of seafarers, accounting for around a fifth of the total.

In 2019, the Philippines contributed 497,680 seafarers internationally, but in 2020, due to the Covid-19 pandemic, the number decreased to 213,299 seafarers and then to 162,966 in 2021[136]. Over the years, Filipino seafarers' remittances have contributed significantly to the development of the Philippines. Through remittances, Filipino seafarers contributed approximately USD 5.23 billion to the national economy in 2020[137], accounting for around 8% of the Philippines' GDP.

The Philippines is served by 342 public and private ports[138], excluding fishing ports. The largest port in the Philippines is Manila, in the country's northern region (Figure 7.3). Cebu, the second-largest city, serves as the primary distribution centre for goods within the central islands. Davao and Cagayan de Oro are the two most important ports in Mindanao in the southern Philippines, mainly for agricultural exports.

Figure 7.3. Port of Manila, the Philippines

[135] MARINA, 2021

[136] Philippine Overseas Employment Administration, 2019 to June 202.

[137] Bangko Sentral ng Pilipinas (BSP), 2020.

[138] Philippine Ports Authority (PPA), 2020.

The Philippines also holds an important position in global shipbuilding. It is the fifth largest shipbuilding nation in the global order book[139]. Export-oriented shipbuilding plays a significant role in the country's economy. In 2019, the Philippines exported a total of USD 557 Million worth of shipbuilding and repair goods[140]. The country has 118 shipyards[141] with a capacity of close to a million GT. The major shipyards in the country include Austal, Hanjin (Figure 7.4), Keppel, Subic Drydock, Herma Shipyard, Tsuneishi, Mactan Shipyard, Navotas Shipyard, and Lucena Shipyard.

Figure 7.4. Hanjin Shipyard, Philippines

The Philippines has prepared its long-term plan through the Marine Industry Development Plan (MIDP) as the roadmap for the accelerated development of the Philippine Maritime Sector from 2019-2028. The MIDP 2019-2028 is the first comprehensive effort to understand and address the Philippines' maritime sector's core problems and their underlying causes. The objective is to develop and implement programs that are more responsive to the needs of the maritime industry, effectively address key challenges, and lead to seizing opportunities in both the domestic and international arenas. The MIDP has nine priority programs, each of which is attainable through component elements and key activities:

- Upgrading of Domestic Shipping in Support of the Nautical Highway Development;

[139] Barry Rogliano Salles (BRS) Group, 2019.

[140] Philippines Board of Investments and Department of Trade and Industry (DTI)

[141] op. cit. 137

- Development of Shipping Services for Maritime Tourism;
- Development of Coastal and Inland Waterways Transport (CIWT) System;
- Strengthening of Safety Standards of Philippine-Registered Fishing Vessels;
- Development of a Global Maritime Hub;
- Enhancement of Maritime Safety in the Philippines;
- Modernization of Maritime Security in the Philippines;
- Establishment of a Maritime Innovation and Knowledge Center (MIKC); and
- Advance the Development and Provision of Qualified and Competent seafarers and Human Capital Requirements for the Global Maritime Industry.

Domestic passenger transport

As an archipelago with 7,461 islands, the Philippines is dependent on ferries to transport passengers and goods. People rely on boats daily to travel between islands, crossing volatile seas often rocked by storms and typhoons. The vessels vary from small motorized outriggers known as motor bancas to roll-on, roll-off car ferries and large passenger ships to state-of-the-art high-speed catamarans. The ferry fleet in the Philippines spans several generations of development.

In the Philippines, 99% of the domestic ferry fleet is owned by small, local associations. Meanwhile, a few big, private companies dominate the ownership of the bigger domestic ships. Examples of the associations and private ferry owners in the Philippines are given in Table 7.1.

Table 7.1. Ferry owners and associations in the Philippines

- Philippine Liners Shipping Association
- Philippine Interisland Shipping Association
- 2GO Shipping
- Philippine Coastwise Shipping Association
- Starlite Shipping
- Montenegro Shipping
- Trans Asia Shipping Co.
- Archipelago Shipping Co.
- Guimaras Boat Owners Association
- Motor Banca Associations
- Hairal Taup Motor Banca Operators
- Boating Industries Association of the Philippines

The ships used in domestic passenger shipping in the Philippines are classified by the MARINA into four main categories: motor vessel, motor banca, motor boat and others. Regarding fleet distribution, 93% of the fleet consisted of passenger motor bancas (76%) and passenger motor boats (%17) in 2021. Table 7.2 presents the number of vessels in the domestic fleet in the Philippines in 2021.

Table 7.2. Profile of the domestic ferry fleet in the Philippines (Source: MARINA, 2021)

Type of vessels	Number of vessels	Example photos
Passenger motor banca	9,140	
Passenger motor boat	2,143	
Passenger others	426	
Passenger motor vessel	379	
Total	**12,088**	

Similar to international shipping, all rules governing domestic passenger transport are classified according to ship type, gross tonnage and ship length. About 95% of the domestic passenger fleet is smaller than 35 GT and less than 50 metres in length.

There are more than 400 different domestic passenger shipping routes in the Philippines (see Figure 7.5 for the common ferry routes). The routes are divided into three main categories:

primary routes with sailing duration of more than 6 hours; secondary routes with sailing duration between 1-6 hours; and tertiary routes with sailing duration of less than 1 hour.

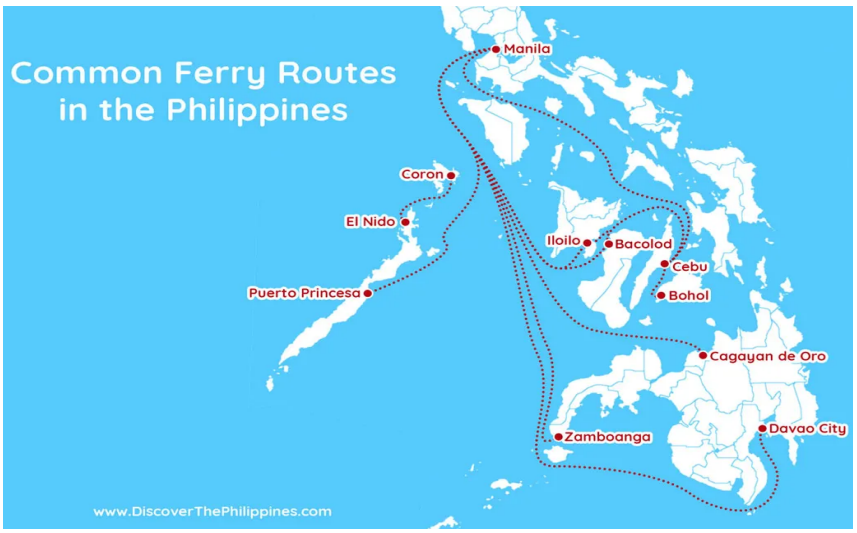


Figure 7.5. Examples of commonly used ferry routes in the Philippines

7.3 Domestic ferry transport regulatory framework in the Philippines

Regulators of domestic passenger transport and institutional framework

The main governmental bodies engaged in the governance of the domestic passenger shipping industry in the Philippines are the Department of Transportation (DOTr), Maritime Industry Authority (MARINA), Philippine Coast Guard (PCG), Philippine Ports Authority (PPA), National Mapping and Resource Information Authority (NAMRIA), and the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). Among these bodies, MARINA is the main regulatory body for shipping, acting as the maritime administration of the Philippines, PCG is the main enforcement body for the industry, and PPA is responsible for port safety. The roles and responsibilities of the main governmental bodies are presented below.

MARINA - The Philippine Maritime Industry Authority

- to monitor and evaluate maritime developments in the industry, and international maritime laws;
- to ensure the Philippines' continuing, active, and effective participation in the international and local maritime industry and its bodies, associations, and networks;

- to formulate and continuously update rules and regulations based on the latest developments on international rules and standards, and incorporate these into the domestic rules and regulations;
- to ensure safe design and construction of ships;
- to supplement the assurance that all passenger ships are always maintained in good condition;
- to periodically conduct ship safety inspections;
- to conduct safety management audits of shipping companies along with flagged vessels;
- to conduct compliance monitoring of the shipping industry; and
- to conduct accident investigations and take the necessary follow up actions.

PCG - The Philippine Coast Guard

- to enforce circulars and develop standard operating procedures for role-performance;
- to conduct inspections (PDI, VSEI, and ERE) of ships and take the necessary actions;
- to improve domestic shipping in the Philippines through improving maritime safety, maritime security, search and rescue, law enforcement, and environmental protection;
- to implement Vessel Traffic Management System (VTMS) in maritime channels (narrow waterways) to ensure traffic safety in collaboration with Port Authorities;
- to maintain the navigation buoys and all systems/assets and to cover the responsibility for search and rescue (SAR) operations.
- to conduct and participate in accident investigations and keep records; and
- to issue notices to mariners and highlight any issues.

PPA - The Philippine Ports Authority

- to provide security to cargoes, port equipment, structure, facilities, personnel etc.;
- to regulate the entry/exit from, and movement within the port of persons, vehicles, and watercraft;
- to maintain order inside the port, in coordination with other local police authorities;
- to supervise private security agencies operating within the port area;
- to enforce rules and regulations promulgated by the MARINA pursuant to law;

- to implement the provisions of the Orange Book[142] which provide for the safety of the travelling public; and
- to implement the guidelines (developed by PPA) for screening passengers and port users in accordance with the requirements of the Inter-Agency Task Force on Emerging Diseases.

DOTr - Department of Transportation

- to determine domestic passenger shipping safety needs;
- to undertake domestic passenger shipping safety needs assessment;
- to identify prospective/responsive measures addressing the identified/assessed domestic passenger shipping safety needs;
- to undertake port network, shipping route network and aids-to-navigation development studies/feasibility studies/investment programming/budget sourcing; and
- to formulate, promulgate, implement, and monitor the effectiveness of regulatory measures, legislative instruments, policy pronouncements and policy strategies with the end-in-view of improving the safety of domestic passenger shipping.

NAMRIA - National Mapping and Resource Information Authority

- to provide navigational charts and publications;
- to conduct hydrographic surveys in port areas; and
- to issue notices to mariners and navigational warnings.

PAGASA - Philippine Atmospheric, Geophysical and Astronomical Services Administration

- to issue gale warnings;
- to coordinate with MARINA and PCG on forecasting of weather and sea state;
- to forecast tracks of tropical cyclones; and
- to advise MARINA and PCG on allowable sea states for different types of ships.

[142] The Orange Book aims to promote and sustain an environment-friendly workplace in all ports and harbours of the country and ensure the health and welfare of all port users, passengers and workers, which also incorporates the rules on handling and transporting of dangerous cargoes.

The other key stakeholders in the domestic passenger shipping industry are the local[143] and international[144] ship classification societies; shipping lines and shipping associations; ship masters, chief engineers, mates and their associations; Society of Naval Architects and Marine Engineers (SONAME); shipyards and their associations; motor banca/small boat owners and operators; and motor banca/small boat builders and repairers.

Rules and regulations for domestic passenger transport

Various regulatory frameworks have been established to govern domestic passenger transport activities in the Philippines including: rules and regulations, Administrative Orders (AO), Memorandum Circulars (MC) and Standard Operating Procedures (SOP). MARINA and PCG are at the frontline of the regulation and enforcement system for domestic passenger shipping safety in the Philippines. Table 7.3 presents a non-exhaustive list of applicable regulations.

Table 7.3. Non-exhaustive list of regulations for domestic ferries in the Philippines

- Philippine Merchant Marine Rules and Regulations, 1997;
- Philippine Ship Safety Rules and Regulations (PSSRR), Part A (500 GT and Above) and Part B (Less than 500 GT), 2021;
- Administrative Order-01-18 Creation of Marine Casualty Investigation Section, 2018;
- Administrative Order-01-19 Procedure for Casualty Investigation, 2019;
- Administrative Order-13-10 Creation Maritime Crisis Management Committee, 2013;
- MARINA Circular-2011-01 Rules for Construction of Wooden Hull Ships and for Wooden Hull Boats with Outriggers, 2011;
- Memorandum Circular-2016-01 Revised rules on the mandatory passenger insurance coverage; emergency assistance to survivors of maritime accidents/incidents; and other relevant concerns, 2016;
- Memorandum Circular-2016-02 Revised rules on the phase out of wooden hulled ships carrying passengers in domestic shipping, 2016;

[143] None of the local classification societies currently authorized by MARINA are actively working.

[144] These are IACS Member classification societies including, Class NK, American Bureau of Shipping, RINA and Bureau Veritas.

- Memorandum Circular-2016-04 Revised rules and regulations on the requirements of life-saving appliances under chapter IX of the Philippine Merchant Marine Rules and Regulations 1997, 2016;
- Memorandum Circular-2017-04 Rules on the importation of passenger ships, 2017;
- Memorandum Circular-MS-2018-18 Revised rules and regulations on the implementation of the mandatory minimum service standards and other services on board ships carrying passengers in the inter-island shipping trade, 2018;
- Memorandum Circular-MS-2020-01 Revised rules on the accreditation of classification societies and entities for the purpose of classification of ships in the domestic trade, 2020;
- Memorandum Circular-MS-2020-03 Revised rules and regulations on safe manning for ships operating in the Philippine waters, 2020;
- Memorandum Circular-SR-2021-01 Revised rules and regulations on the tonnage measurement of Philippine registered ships, 2020;
- Memorandum Circular-SR-2021-02 Revised rules and regulations on load line survey, assignment, marking and certification for Philippine registered ships, 2020;
- Memorandum Circular-SR-2020-03 Rules on the construction and certification of vessels using composite materials, 2020;
- Memorandum Circular-05-12 Master's Declaration of Safe Departure, 2012;
- Memorandum Circular-06-12 Vessel Safety Enforcement Inspections, 2012;
- Memorandum Circular-07-12 Pre-Departure Inspection, 2012;
- Memorandum Circular-08-12 Emergency Readiness Evaluation, 2012;
- Standard Operating Procedures-08-12 Master's Declaration of Safe Departure, 2012;
- Standard Operating Procedures-09-12 Pre-Departure Inspection of Vessel, 2012;
- Standard Operating Procedures-10-12 Vessel Safety Enforcement Inspection, 2012; and
- Standard Operating Procedures-11-12 Emergency Readiness Evaluation, 2012.

7.4 Domestic ferry accidents in the Philippines[145]

Trends in accidents

Given the Philippines' archipelagic nature, passenger shipping is the most important and preferred means of public transport. Of the more than 12,000 domestic passenger vessels, larger steel-hulled motor vessels constitute barely 1 to 3% whereas 97% are smaller wooden and fiberglass hulled, motor boats and motor bancas less than 35 GT. Compared to the motor vessels, the motor boats and motor bancas are of primitive construction which makes them even more vulnerable to heavy seas, and sudden weather changes in the Philippines which encounter more than 20 typhoons annually.

According to the database of this study, 25 accidents occurred in the Philippines between 2011-2021. The distribution of the number of accidents by year suggests a decreasing trend (Figure 7.6) which may be attributed to the ongoing government efforts to stem the accident numbers and the numerous technical assistance projects for capacity building.

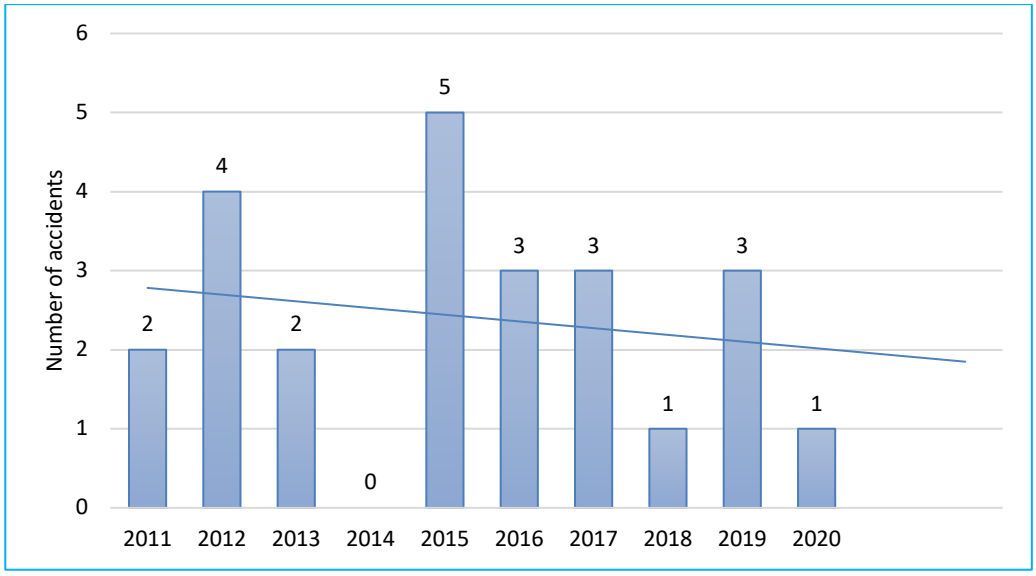


Figure 7.6. Trend of accidents in the Philippines: 2011-2021 (Source: Arcsilea)

Regardless, most recently, in 2022, there were two ferry fires. On 23 May 2022, the fastcraft, *mv Mercraft 2* carrying 126 passengers and 8 crew caught fire while en route from Polillo Island

[145] This statistics in this section of the report is drawn from the Arcsilea database.

to Real, Quezon Province. 127 people were rescued while seven lost their lives[146]. On 27 August 2022, the *mv Asia Philippines* carrying 49 passengers and 38 crew members from Calapan, Mindoro Province to Batangas caught fire at Batangas anchorage although all passengers and crew were accounted for[147].

Causal factors of accidents

A total of 599 persons lost their lives as a result of domestic ferry accidents in the Philippines between 2011-2021. The study revealed that capsizing, hull failure, technical failure, and collision followed by sinking represented 88% of the accidents (Figure 7.7), and 95% of the lives lost. The causes frequently cited in studies, and revealed from the accident database of this study include: heavy weather and sea conditions, discrepancies in inspection and enforcement mechanisms (unregistered ferries, unseaworthy vessels, overloaded sailing), human error (poor lookout, poor seamanship), violations (overcrowding), technical failures, instability (capsizing), squall (weather phenomena), aged ships (imported second-hand), inadequacies in port infrastructure and shore navigation aids, shortage of qualified officers and crew in domestic shipping inaccessibility of affordable financing and lack of attractive incentives (small/medium-sized companies), weak regulation and supervision of shipping, fishing, and other maritime-related enterprises and activities including enforcement. [148, 149, 150, 151]

[146] The New York Times. (2022, May 23). Seven dead and more than 100 rescued in Philippine ferry fire. https://www.nytimes.com/2022/05/23/world/asia/philippine-ferry-fire.html

[147] AP News. (2022). More than 80 people rescued from Philippine ferry fire. https://apnews.com/article/fires-asia-philippines-manila-search-and-rescue-efforts-b204683ca6ab5d98019637a80168f867

[148] Golden, A. S., & Weisbrod, R. E. (2016). Trends, causal analysis, and recommendations from 14 years of ferry accidents. Journal of Public Transportation, 19(1), 2. https://digitalcommons.usf.edu/jpt/vol19/iss1/2/

[149] Baird, N. (2018). Fatal ferry accidents, their causes, and how to prevent them. PhD Thesis, Australian National Centre for Ocean Resources and Security, University of Wollongong, Australia. https://ro.uow.edu.au/theses1/498/

[150] Ong Jr, J. R. T. (2021). An analysis of domestic ferry safety and the pre-departure inspection enforcement in the Philippines. Masters' Thesis, World Maritime University. Sweden. https://commons.wmu.se/all_dissertations/1727

[151] MARINA (2021). Philippines: Maritime Industry Development Plan (MIDP), 2019-2028. Problem Tree for the Maritime Industry. https://marina.gov.ph/wp-content/uploads/2022/06/10-YEAR-MIDP-2021.pdf

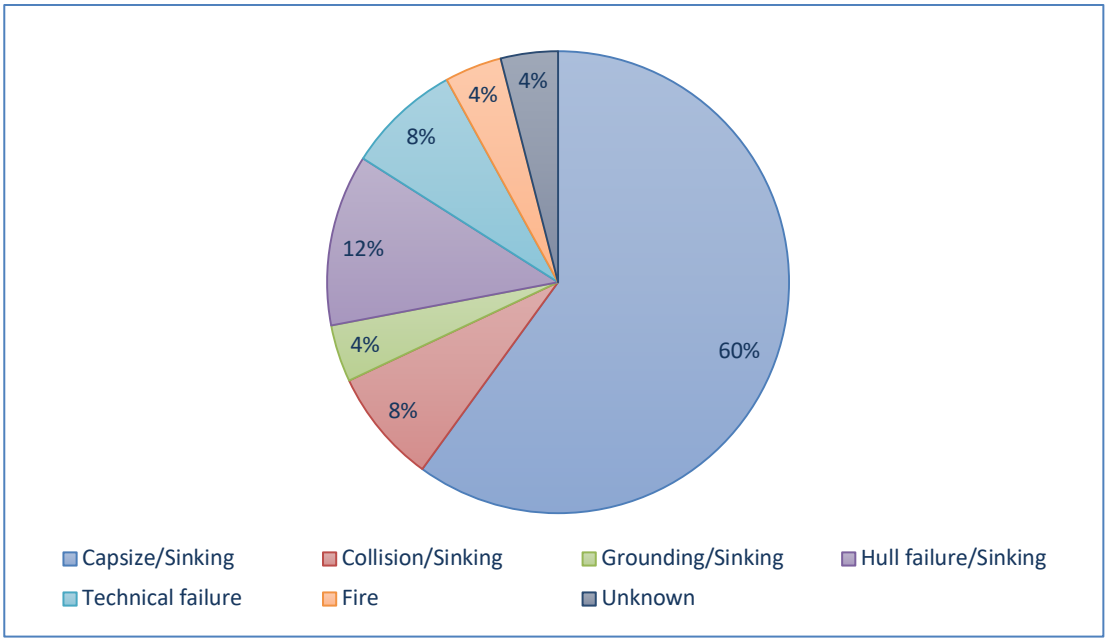


Figure 7.7. Percentage distribution of accidents in the Philippines: 2011-2021 (Source: Arcsilea)

Geographic distribution of waterways accidents

The Philippines has navigable rivers, channels, and other inland bodies of water which amount to 3,219 kilometres but are limited to vessels with drafts less than 1.5m[152]. However, as the world's second largest archipelagic country, the inter-island routes between the main and remote islands remain relatively risky in terms of domestic passenger safety. The accidents appear to be distributed over different areas (Figure 7.8). However, the routes to and from Mindanao Island (12%; Sulu Sea Routes, Mindanao River Routes), Cebu Island (12%; off Talisay City, Cebu Port Area), and Leyte Island (12%; Surigao-Leyte Channel and Ormoc Port Area) are identified as the top three risks with a slightly higher number of accidents. In addition, especially during the tourist seasons, the routes to and from Boracay Island (8%; Boracay-Panay Island Routes), and Iloilo Island (8%; Iloilo-Guimaras Routes) can also be congested and, therefore, prone to accidents. The percentage distribution of accidents in Philippine waters is presented in Figure 7.8 and a more detailed overview of the geographic distribution is provided in Table 7.4.

[152] Index Mundi. (2020). Philippines Waterways. https://www.indexmundi.com/philippines/waterways.html

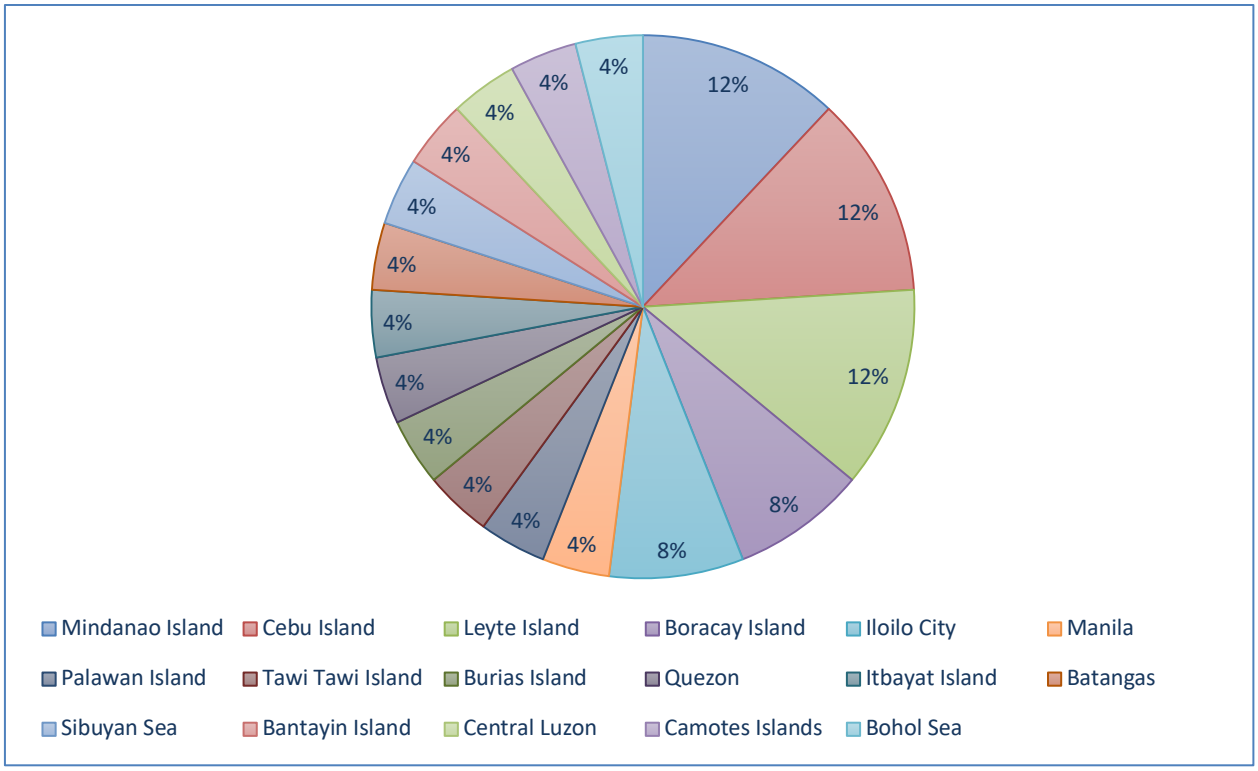


Figure 7.8. Percentage distribution of accidents in the Philippines by location: 2011-2021 (Source: Arcsilea)

Table 7.4. Geographic distribution of waterways accidents in the Philippines

Location	Accident prone area
Mindanao Island	Sulu Sea Routes Mindanao River Routes (Rio Grande de Mindanao)
Cebu Island	Off Talisay City Cebu Port Area
Leyte Island	Ormoc Port Area Surigao-Leyte Channel
Boracay Island	Boracay-Panay Island Routes
Iloilo Island	Iloilo-Guimaras Routes
Other island routes	Gumaca-Alabat Island Routes Gunungsitoli-Sibolga Batanes Archipelago Off Barangay Corona Sibuyan-Romblon Island Routes Samboan-Dapitan City Routes Lingos-Polillo Island Routes Near Manila Bay Near el Nido Off Tawi Tawi Province Near Masbate

Although due to a variety of complex organisational factors and frequent natural disasters (lacking life-saving and firefighting equipment, human error, typhoons) domestic passenger vessel accidents continue to occur in the Philippines, several measures are being taken to address the safety issues. The Maritime Industry Development Plan (MIDP) and the strategic roadmap covering the years 2019-2028 aim to accelerate and expand domestic shipping services in a safe, secure and efficient manner. Areas of focused improvement include enlarged administration with expanded human resources and wider presence, formulation and implementation of numerous safety policies, better reporting culture, enhanced effectiveness and efficiency of inspections, and a free press. Besides, there are ongoing internationally funded infrastructure projects related to domestic shipping, and there is an internationally funded ongoing project aiming at enhancing the safety and energy efficiency of domestic passenger ships in the Philippines. The current efforts of maritime stakeholders, as well as ongoing international projects, can be considered as an indicator that authorities are likely to welcome an external safety intervention in the future.

8 SENEGAL

8.1 General information and characteristics of Senegal

Location and geography

The Republic of Senegal is located on the bulge of West Africa and covers an area of 196,722 square kilometres. Senegal is bordered to the west by the Atlantic. To the north is the 813 km border with Mauritania along the Senegal River, and to the east is the 419 km border with Mali. The southeast has a 330 km border with Guinea, and in the South-Southwest is a 338 km border with Guinea-Bissau, both bordering along the Casamance River. The Gambia, with a 740 km border, penetrates more than 320 km into Senegal, from the Atlantic coast to the centre of Senegal along the Gambia River.

Figure 8.1. Map of the Republic of Senegal (Source: World Atlas, 2022)

Senegal has approximately forty small islands. The historical importance of Goree Island in offshore Dakar as a UNESCO World Heritage site and a historical slave-trading hub makes it a popular tourist destination. The island is a key destination for African-Americans who come to pay their respects and reflect upon their ancestors' past. Lake Retba, located near Dakar, is one of the rare lakes with naturally pink or reddish-pink water and is yet another well-known, distinguishing feature of the country.

Rebta Lake, Senegal (Source: https://senegalski.com/travel-senegal/pink-lake-senegal/)

The Gorée Island, Senegal (Source: https://www.portdakar.sn/en/nos-services/trafic-passager/dakar-goree)

Demographics

As of 2022, Senegal has a population of 17.74 million, an annual population growth rate of 2.8%, and an average population age of 19, according to local statistics from ANSD[153]. Almost one-quarter of the population lives in the capital, Dakar.

French is the official language but is used regularly only by the literate minority. Almost all Senegalese speak an indigenous language, of which Wolof has the largest usage. Other languages include Serer, Pulaar, Diola (Jola), Mandinka, and Soninké.

Senegal is divided into fourteen regions, the highest level of administrative division. The capital Dakar constitutes a region, and the remaining thirteen regions are Ziguinchor, Diourbel, Saint-Louis, Tambacounda, Kaolack, Thiès, Louga, Fatick, Kolda, Matam, Kaffrine, Kédougou and Sédhiou.

Political

Senegal attained independence in 1960 and has since been one of the most stable countries in Africa[154]. Senegal has good relationships with the international community, with a peaceful traditional and regional policy.

Senegal has a mixed legal system based on the French civil code and Senegalese Islamic law. The first constitution of Senegal was promulgated in 1963 and revised in March 1998. Voters approved a new constitution in January 2001. Senegal is a multiparty republic. The 2001 constitution provides for a strongly centralized presidential regime.

The President is Chief of State and Head of Government, elected by popular vote (absolute majority) over two rounds, with a maximum of two consecutive terms. In 2016, the presidential term was reduced via referendum from seven to five years. The president appoints the Prime Minister as Head of the Government, who nominates the Council of Ministers in consultation

[153] ANSD stands for "Agence Nationale de la statistique et de la Démographie"- National Agency for Statistics and Demography, is an administrative structure endowed with legal personality and management autonomy and placed under the authority of the Minister in charge of Statistics.

[154] World bank (2022). The World Bank in Senegal: Overview. https://www.worldbank.org/en/country/senegal/overview.

with the President. The President is also the armed forces Commander-in-Chief and enjoys immense executive powers.

The legislature in Senegal is unicameral. The parliament, called National Assembly, has 165 seats, with the majority (105) of its members elected by direct popular vote. All legislators serve five-year terms. Legislative power is vested in both the government and the parliament.

Judicial power in Senegal is exercised through the Constitutional Council, Council of State, Court of Cassation, Court of Accounts, and the lower Courts and Tribunals. Senegal also has a High Court of Justice, whose members are elected by the National Assembly. The High Court tries government officials for misfeasance and crimes committed while performing their government duties.

Each region is administered by a Governor. The Governor is assisted in coordination by two deputy governors, one of whom handles administration and the other, development. The regional assemblies are composed of general councillors who are responsible for local taxation. There are also autonomous urban communes. An elected municipal council governs Dakar.

The fourteen regions are further subdivided into *départements* and *arrondissements*. Besides ministers, the Prefect of each *département* represents the Republic.

Economy

The Senegalese economy is among the most stable and prosperous in sub-Saharan Africa, maintaining a sustained growth of over 6% annually over recent years.[155] Mining industries, construction, tourism, fisheries, and agriculture are the main drivers of Senegal's economy and primary employment sources. In addition, the country's social and political stability and favourable business environment make Senegal a safe destination for local and international investment.

[155] World Bank (2022). The World Bank in Senegal: Overview. https://www.worldbank.org/en/country/senegal/overview.

According to the World Bank, Senegal's GDP in 2021 was USD 27.63 billion. Services remain the primary sector and main contributor to GDP, with agriculture being the most dynamic growth engine.

Despite economic growth and political stability, Senegal faces development challenges; more than a third of the population live below the poverty line. Poverty and food insecurity are prevalent in rural areas to the north, east, and south of Senegal.[156]

8.2 Maritime profile

Shipping

Senegal has 530 km of the Atlantic coastline on the west. Maritime transport in Senegal is carried out through the ports of Dakar, Ziguinchor, and Kaolack. The Autonomous Port of Dakar (PAD) accounts for the majority of maritime traffic in the country and has long been considered the backbone of Senegal's economy, handling 95% of foreign trade and generating 90% of customs revenues[157].

Senegal's current fleet of only 35 registered ships does not reflect the country's ambition (Figure 8.2 refers). The leading shipping companies in Senegal are:

- the Senegalese Maritime Navigation Company – a vessel chartering company;
- the Maritime Transport Company – engaged in oil product transportation;
- the Société Nouvelle des Salins du Saloum – engaged in salt transportation; and
- the liner Dakar-Ziguinchor - involved in domestic ferry transport.

A naval repair shipyard, DakarNave, affiliated with Lisnave International, SA is located within the port of Dakar.

[156] World Food Programme. (2022). WFP Senegal Country Brief, April 2022. https://docs.wfp.org/api/documents/WFP-0000140340/download/.

[157] Haji, H. & Ndiaye, O. (2020). Port Autonome de Dakar: Analysis April 2020.

Figure 8.2. Maritime profile of Senegal (UNCTAD, 2021)

Inland waterways and passenger ferry transport

In addition to the 530 km of Atlantic coastline, three Rivers cross Senegal from the east to the west: Senegal River (1,700 km) in the north, Gambia River (750 km) and Casamance River (300 km) in the south, whilst the Saloum River (105 km) east of Kaolack flows down into the Atlantic.

Senegal has about 1,000 km of navigable inland waterways, split between the rivers Senegal, Saloum, and Casamance[158]. Domestic maritime transport through these rivers is a social and economic need in Senegal. Ferry transport is a vital link between the southern part of Senegal and Dakar. Sea and river transport between the port of Dakar and the secondary ports of Saint Louis, Kaolack, and Ziguinchor are of particular importance.

Figure 8.3. The Senegal River

[158] The Wold Factbook, 2022. Explore all Countries: Senegal. https://www.cia.gov/the-world-factbook/countries/senegal/#transportation

Dakar is on the Cabo Verde peninsula on the Atlantic, and Banjul, Ziguinchor, and Gorée Island are accessible from Dakar via ferry. Ferry travel, for example, between Dakar and the southern Senegalese city of Ziguinchor is approximately 20 hours, which is faster than travelling overland. Figure 8.4 illustrates the various ferry types in operation in the country, while the main routes for ferry transport in Senegal are set out at Table 8.1 and illustrated at Figure 8.5.

Table 8.1. Main passenger ferry transport routes in Senegal

Route	Frequency	Vessels in service	Company
Dakar - Ziguinchor	four times a week	car ferry	COSAMA
Dakar - Gorée Island	every two hours, daily	two vessels	operated by a public transport service, Liaison Maritime Dakar-Gorée (LMDG), managed by the Societe Nationale du Port Autonome De Dakar (SONAPAD)
St. Louis - Podor	one week from Podor to St Louis and the following week from St Louis to Podor	cruise ship	
Dakar-Banjul (The Gambia) across the Gambia River	around 3 million passengers, annually	three ferries	

Figure 8.4. Examples of different types of ferries in Senegal

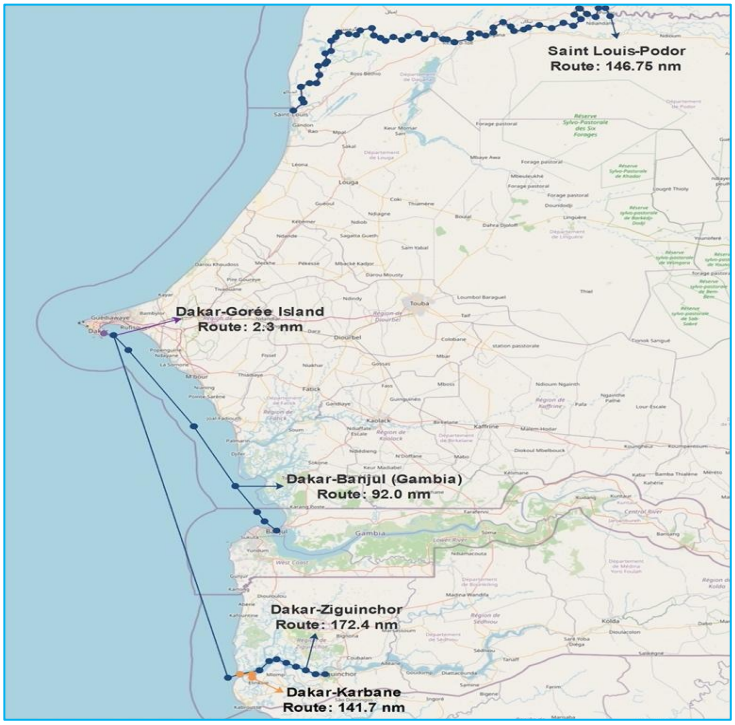


Figure 8.5. Plot of main passenger ferry routes in Senegal (copyright authors)

8.3 Maritime regulatory framework in Senegal

Applicable maritime regulations

Maritime transport in Senegal is primarily governed by the Senegalese Code of Merchant Marine (CMM). The first version of the CMM dating back to 22 March 1962, shortly after independence was strongly inspired by the 1924 Brussels Convention. The current Code of Merchant Marine, 2002 was established by Law n° 2002-22 of 16 August 2002.

As regards international maritime instruments, Senegal has ratified 25 Conventions adopted by the International Maritime Organisation (IMO) and the International Labour Organisation (ILO); the latest being ratification of the 2006 Maritime Labour Convention in 2019. A non-exhaustive list of applicable maritime legal texts in Senegal governing maritime transport, including domestic ferry transport by sea and rivers is provided at Table 8.2.

Table 8.2. Non-exhaustive list of maritime laws and regulations in Senegal

- Presidential Instruction No. 0582/PR/MSAP/EMP/CAB.11 of 30 October 1995 on the use of Senegalese territorial waters and port facilities;
- Law n° 2001-01 of 15 January 2001, establishing the Code of the Environment, 2001, supplemented by Decree No. 2001-282 of 12 April 2001 implementing the Environment Code, 2001;
- Law n° 2002-22 of 16 August 2002, establishing the Code of Merchant Marine, 2002;
- Decree No. 2002-933 of 3 October 2002 on the issue of professional maritime training qualifications and the conditions governing the performance of duties on board commercial and fishing vessels, as well as armed pleasure craft with a crew role;
- Decree No. 2003-651 of 12 August 2003 established within the Gendarmerie a Special Section for the Protection of the Environment, 2003;
- Decree n° 2004-283 of 5 March 2004 laying down detailed rules for the application of the Law on the Merchant Marine Code;
- Decree No. 2006-322 of 7 April 2006 establishing the High Authority for the Coordination of Maritime Safety and the Protection of the Marine Environment (HASSMAR), 2006;
- Order No. 006944 of 17 October 2006 on the High Authority for Maritime Safety, Maritime Security, and the Protection of the Marine Environment (HASSMAR);
- Decree No. 2006-323 of 7 April 2006 establishing the National Emergency Response Plan at Sea (Plan National d'Interventions d'Urgence en mer - PNIUM);
- Decree No. 2009-583 of 18 June 2009 on the establishment, organization, and functioning of the National Agency for Maritime Affairs (ANAM), 2009;
- Law n° 2009-583 of 18 June 2009 on the creation, organization, and functioning of the National Agency for Maritime Affairs (ANAM), 2009;
- Law No. 2010-09 of 23 April 2010 on the Maritime Ports Police, 2010;
- Decree n° 2011-821 of 16 June 2011 repealing and replacing Decree n ° 2010-426 of 31 March 2010 and fixing the rates of financial resources of the National Maritime Affairs Agency (ANAM);
- Decree No. 2011-1255 of 23 August 2011 on the organization of the Ministry of Maritime Economy;
- Decree n° 2014-884 of 22 July 2014 on the powers of the Minister of Fisheries and Maritime Economy, as amended by Decree No. 2015-121 of 23 January 2015; and
- Decree n° 2016-933 of 5 July 2016 on the health of seafarers.

Institutional framework for regulating maritime transport

Several institutions are involved in regulating shipping activities in Senegal. At the government level, there is technical supervision from the Ministry of Fisheries and Maritime Affairs and financial supervision from the Ministry of Economy and Finance. Under the Ministry of Fisheries and Maritime Affairs, various directorates are involved in the institutional framework regulating maritime transport, including:

- Directorate of Merchant Marine;
- Directorate of Maritime Fisheries;
- Directorate of Ports and Inland Maritime Transport; and
- Directorate of Port Infrastructure.

Other Authorities are also involved in regulating maritime transport in Senegal among others, the High Authority for the Coordination of Maritime Safety, Maritime Security and protection of the Marine Environment (La Haute Autorité chargée de la Coordination de la Sécurité maritime, de la Sûreté maritime et de la Protection de l'Environnement marin - HASSMAR); the National Agency for Maritime Affairs (Agence Nationale des Affaires Maritimes - ANAM); the Directorate of Secondary Ports and Inland Shipping DPTMI; and the Port Autonome de Dakar (PAD).

HASSMAR

HASSMAR is designated as the High Authority responsible for maritime safety. Created by Decree No. 2006-322 of 7 April 2006, the HASSMAR is an autonomous administrative structure with an operational vocation that intervenes in the coordination of emergency interventions at sea, on rivers, and in port areas. HASSMAR also regulates the interaction between the different bodies within the maritime sphere. Its responsibilities, among others, include:

- maintenance of public order, the safety of navigation, the prevention and fight against unlawful acts; the safety and security of the population, resources, and facilities;
- protection of the marine environment and preservation of maritime resources; and
- coordination of the response to oil spills at the national level.

ANAM

ANAM, created by Decree No. 2009-583 of 18 June 2009, is placed under the supervision of the Directorate of Merchant Marine and the Directorate of Ports and Inland Maritime Transport. ANAM has managerial autonomy and is entrusted with a service of public duty. At its core, ANAM comprises five directorates:

- Directorate of Maritime Safety and Prevention of Marine Pollution;
- Directorate of Seafarers, Maritime Labour, and Training;
- Directorate of Maritime, River and Port Transport;
- Directorate of Maritime Operations; and
- Directorate of Maritime Projects and Investigations.

As a delegated maritime authority, ANAM is responsible for implementing the Senegalese State's policy on merchant shipping and applying international conventions, codes, and maritime regulations in force in Senegal. Its mission, among others, includes:

- ships' and seafarers' administration: registration, certification, and inspection;
- participation in the policing of marine pollution: prevention against polluting the marine environment;
- participation in the policing maritime and river navigation: controls at the quayside, at sea, and in rivers;
- monitoring movement of undecked ships, and boats at sea and in inland waterways; and
- development of so-called secondary ports, etc.

DPTMI

The Directorate of Secondary Ports and Inland Shipping, or DPTMI is responsible for managing and operating secondary ports and waterways. The commercial exploitation of waterways is entrusted to the Chambers of Commerce of the cities concerned, based on plans signed off with the State.

PAD

The Port Autonome de Dakar (PAD) has a key role in regulating maritime transport in Dakar. According to Convention No. 0174 of 17 October 1973, for the Dakar-Gorée Island maritime

transport by ferry, a public company, the National Company of the Autonomous Port of Dakar (Societe Nationale du Port Autonome de Dakar - SONAPAD) is responsible under the authority of the Director General of the Port Authority of Dakar, for ensuring crossings with defined safety conditions. In addition, the Authority implements policies aimed at the following [159]:

- overseeing the operation and maintenance of the launches per the applicable regulations concerning the safety and security of passenger ships;
- ensuring continuity of service by focusing on punctuality and regularity of rotation;
- building customer loyalty by strengthening the Maritime Dakar-Gorée link in its role as a showcase; and
- promoting Gorée as Senegal's unmissable tourist place leveraging its classification as a UNESCO World Heritage Site.

OMVS

At the regional level, the Senegal River Basin Development Authority (in French, L'Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS)) was created in 1972 by Senegal, Mali, Mauritania, with Guinea joining in 2006. The OMVS' mission is to jointly manage the Senegal River and its drainage basin. Its regional objectives are increasing food security, producing energy, reducing poverty and promoting the free movement of goods and services.

To fulfil its objective, the OMVS works to make the river navigable. During the 1960s, navigation between Saint-Louis and Kayes flourished, but it ceased entirely in the 1970s due to poor river maintenance and the 1973-1975 drought of the Senegal River. Presently, only one tourist ferry boat, Bou El Mogdad, operates on the river. OMVS has worked on this navigation project since it was founded, carrying out many technical, environmental, economic and financial studies. It has now become one of the priority objectives of its agenda, and the OMVS hopes to quickly start the first phase of its project to create a continuous and lasting navigable waterway of 905 km, between Saint-Louis (Senegal) and Ambidedi (Mali)[160] (see route map at Figure 8.6).

[159] See: https://www.portdakar.sn/en/nos-services/trafic-passager/dakar-goree

[160] Organisation pour la Mise en Valeur du fleuve Sénégal. (2022). https://www.omvs.org/

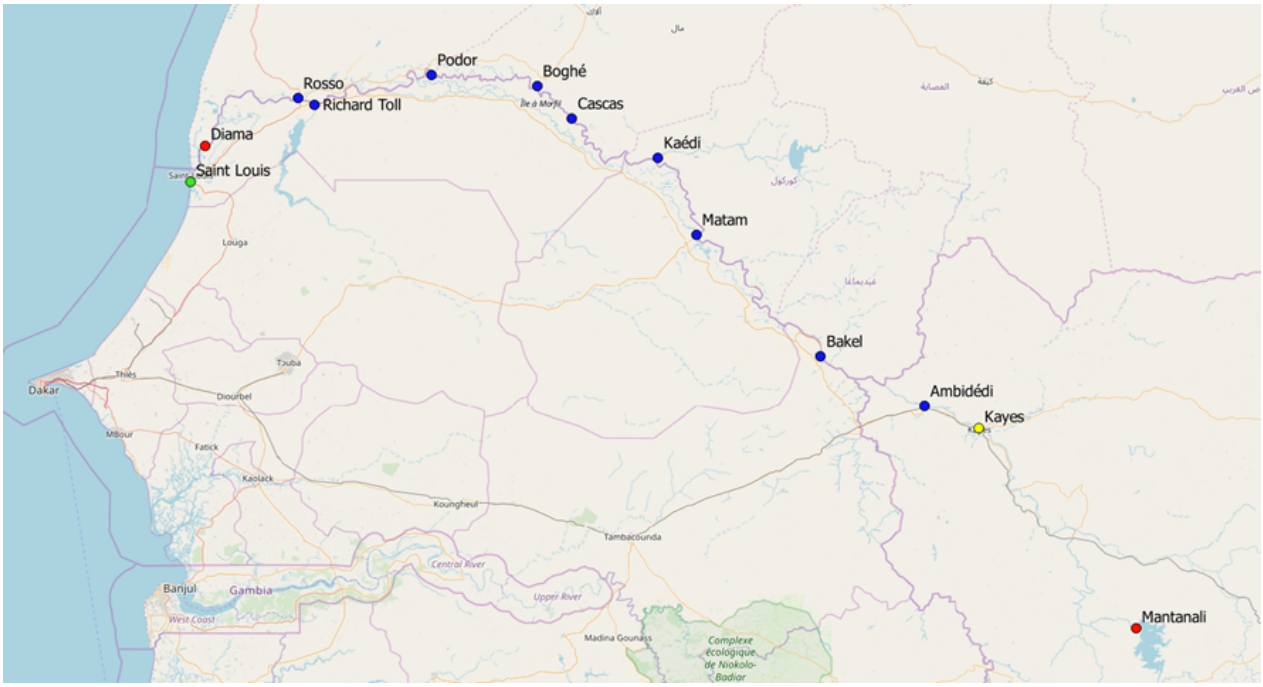


Figure 8.6. Route map of OMVS', St. Louis, Senegal – Ambidedi, Mali waterway project

8.4 Domestic ferry accidents in Senegal[161]

Database records

Unlike the other countries examined in the scope of this study, only one accident is recorded in the dataset against Senegal namely, the capsizing and sinking accident that occurred in 2017 off Bettenty and resulted in the total loss of the ship and 20 fatalities.

The *Le Joola* casualty

The capsize and sinking of the Senegalese government-owned *Le Joola* on 26 September 2002 with the catastrophic loss of 1,863 lives (only 64 persons saved) has earned this casualty the epithet of "Africa's Titanic"[162, 163] (Figure 8.7). The ship was enroute from Ziguinchor to Dakar beyond its permitted distance from the coastline, when it ran into a violent storm. With over 2,000 passengers onboard, about half without tickets, the ship had taken nearly four times more

[161] This section of the report is based on statistics drawn from the Arcsilea database.

[162] Barton, K. S. (2020). Africa's Joola shipwreck: Causes and consequences of a humanitarian disaster: Lexington Books.

[163] Jullien, M. (2012). Africa's Titanic: Seeking Justice a Decade after Joola. BBC News, 12.

passengers than its design capacity of 580 passengers[164, 165, 166]. Many passengers were sleeping on deck, above the centre of buoyancy and, thereby, contributed to the ship's instability. It took several hours for rescue operations to begin. Numerous sources suggest that the accident was caused by a variety of factors, including negligence. While the capsizing may be directly attributed to the prevailing rough weather and sea conditions, the ferry violated her certified area of coastal water operations. Both, the capsizing and the high death toll are also attributed to overcrowding. The ship was 12 years old and built to be in service for at least 30 years but had suffered several technical problems, which were attributed to poor maintenance by its owners and not to design or manufacturing flaws.

The government of Senegal took significant action in response to this tragedy. Senegal's ferries are now managed and inspected with great care. Both, boarding and the quantity of cargo permitted on ferry boats are now strictly regulated.

Figure 8.7. mv Le Joola accident on 26 September 2002 [167, 168]

[164] Rothe, D., Muzzatti, S., & Mullins, C. W. (2006). Crime on the high seas: Crimes of globalization and the sinking of the Senegalese Ferry Le Joola. Critical Criminology, 14(2), 159-180.

[165] Barton, K. (2016). The Joola: the Geographical Dimensions of Africa's Greatest Shipwreck. American Geographical Society. http://www.focusongeography.org/publications/articles/joola/index.html

[166] AnswersAfrica. (Remembering The Le Joola Disaster: Africa's Own Titantic. https://answersafrica.com/le-joola-disaster.html

[167] RFI. (2017). Sénégal: 15 ans après le naufrage du Joola, le dossier au point mort. https://www.rfi.fr/fr/afrique/20170926-senegal-15-ans-apres-le-naufrage-joola-le-dossier-point-mort

[168] WakatSera. (2017). Sénégal: les naufragés du Joola crient justice!. https://www.wakatsera.com/senegal-les-naufrages-du-joola-crient-justice/

Accidents involving migrant boats

Besides domestic passenger transport used by the local people and tourists, one of the important issues in Senegal, is the carriage of illegal immigrants using passenger boats between Senegal and the Canary Islands. Until 2006, when a record 31,000 asylum seekers and migrants made the crossing, the Atlantic route was considered the most dangerous sea passage for Africans attempting to reach Europe. In 2020, more than 19,500 people attempted to reach the Canary Islands through this Atlantic route. From Dakar, the distance of around 870 nm should take nearly 8-9 days by boat in rough seas and away from shore, which obviously makes for a voyage inherently fraught with risk. Therefore, annually, there are several accidents during these migrant passages, mostly resulting in sinking and loss of life. In September 2020 alone, of the 14 boats carrying 663 migrants leaving Senegal for the Canary Islands, 26% experienced an incident or shipwreck[169, 170] (see photographs at Figure 8.8). Three further examples of recent incidents are presented below.

Figure 8.8. Examples of migrant boats and consequent accident at sea [171, 172]

[169] International Organization for Migration (IOM). (2020). 2020's deadliest shipwreck so far, sees 140 migrants perish off Senegalese coast. https://news.un.org/en/story/2020/10/1076512

[170] DeutcheWelle. (2020). Senegal: At least 140 migrants die after boat sinks. https://www.dw.com/en/senegal-at-least-140-migrants-die-after-boat-sinks/a-55440418

[171] HeritageTimes. (2022). Boat Carrying Migrants To Europe Capsizes In Senegal, 13 Feared Dead. https://www.theheritagetimes.com/boat-carrying-migrants-to-europe-capsizes-in-senegal-13-feared-dead/

[172] Euractive. (2020). Hundreds of African migrants reach Canary Islandshttps://www.euractiv.com/section/justice-home-affairs/news/hundreds-of-african-migrants-reach-canary-islands/

On 24 October 2020, a vessel which departed from Mbour, western Senegal enroute to the Canary Islands capsized near Saint Louis, on Senegal's northwest coast a few hours after departure. The vessel was carrying more than 200 migrants and as a result of the accident, more than 140 people lost their lives. Senegalese and Spanish navy units as well as fishing boats in the vicinity managed to rescue 59 people[173]. It was reported as the deadliest shipwreck recorded in 2020 on the Atlantic route. It was also emphasized by the local authorities that with that shipwreck, the tally of reported deaths on the Atlantic migrant route for 2020 was at least 414, nearly twice the figure of 210 in 2019, indicating a significant increase in the number of departures from West Africa to the Canary Islands[174].

In August 2021 a boat, carrying around 60 migrants capsized off Saint Louis, and dozens of passengers lost their lives[175].

In 2022, on 27 June, while the scoping study was underway, a boat, carrying around 150 people (illegal migrants trying to get to Europe) capsized after a fire broke out on board. At least 13 persons lost their lives while 40 were missing and 91 people were rescued. The accident occurred off Kafountine in the Southern Casamance area at night time.

Inference from migrant boat accidents

The main inference from the large number of loss of lives in each migrant boat incident is the lack of capacity to undertake mass rescue operations at sea. This lack is equally applicable to any distress situation involving a domestic ferry with hundreds of passengers onboard. The ability of a coastal State to undertake mass rescue operations in waters under its jurisdiction is a critical imperative, especially if large passenger ships operate in the coastal State's jurisdiction.

[173] InfoMigrants. (2020). Senegal: At least 140 perish in deadliest shipwreck of the year https://www.infomigrants.net/en/post/28209/senegal-at-least-140-perish-in-deadliest-shipwreck-of-the-year

[174] Impakter. (2021). Migrant Deaths in the Atlantic Highest Since 2007, as EU 'Big Wall' in the Mediterranean Is Avoided. https://impakter.com/migrant-deaths-in-atlantic-highest-since-2014/

[175] Voice of America (VOA). (2022). Boat Sank off Senegal Coast - 13 Migrants Dead https://www.voaafrica.com/a/boat-sank-off-senegal-coast-13-migrants-killed-/6638065.html

9 TANZANIA

9.1 General information and characteristics of Tanzania

Geography

The United Republic of Tanzania, located at the south of the equator in East Africa was formed as a sovereign State in 1964 through the union of Tanganyika and Zanzibar.[176] Its land area measures 947,303 square kilometres. Three of Africa's great lakes are partly within Tanzania. To the north and west lie Lake Victoria, Africa's largest lake, and Lake Tanganyika, the continent's deepest lake. To the south lies Lake Malawi. The coastline to the east of the country on the northwest Indian Ocean is approximately 1,424 kilometres. The Zanzibar Archipelago is just offshore and incorporates several offshore islands, including Unguja (called Zanzibar Island), Pemba, and Mafia[177] (Figures 9.1 & 9.2). Tanzania borders Uganda, Kenya, Comoros Islands, Mozambique, Malawi, Zambia, Rwanda, Burundi, and DRC.

Figure 9.1. Map of the United Republic of Tanzania (Source: World Atlas, 2022)

Figure 9.2. Map of the Zanzibar archipelago

[176] Mandia, M. H., 2000. An investigation into the system of managing maritime safety [and] environment protection in the United Republic of Tanzania. World Maritime University, Sweden

[177] World Atlas, 2022. Africa/Tanzania, https://www.worldatlas.com/maps/tanzania

Demographics

Tanzania had an estimated population of 61.5 million in 2021. It has one of the highest birth rates in the world of 36.2 births per 1,000 people. More than 44% of the population is under the age of fifteen.[178] The population is unevenly distributed. Most people live on the northern border and the eastern coast of Tanzania and the remainder of the country is sparsely populated.

Dar es Salaam is the de facto capital and the largest city with a population of 2,698,652.[179] Located in the centre of Tanzania, Dodoma is the de jure capital, although action to move government buildings to Dodoma has stalled.

Tanzania's population consists of about 125 ethnic groups, the largest being the Sukuma, Nyamwezi, Chagga, and Haya peoples having more than one million members each.

Over a hundred different languages are spoken in Tanzania and include all four of Africa's language families – Bantu, Cushitic, Nilotic, and Khoisan. Swahili and English are Tanzania's official languages. Other languages are Indian languages and Portuguese (spoken by Goans and Mozambicans)[180].

Political

Tanzania, as best described by an interview participant, is one nation State with two countries – Mainland Tanzania and Tanzania Zanzibar. Consequently, the State is administered by a two Government system: the Government of the United Republic of Tanzania (Union Government) and the Revolutionary Government of Zanzibar.

The Union government was formed in 1964 after Tanganyika and the Zanzibar became independent, respectively in 1961 and 1964[181]. The United Republic of Tanzania is a republic with

[178] Word Bank. (2022). Data about Tanzania population. https://data.worldbank.org/indicator/SP.POP.TOTL?locations=TZ.

[179] PopulationStat. (2022). World Statistical Data, Dar es Salaam, Tanzania Population. https://populationstat.com/tanzania/dar-es-salaam

[180] Levinson, D. (1998). Ethnic groups worldwide: a ready reference handbook. Greenwood International. Oryx Press, Phoenix, USA.

[181] Cameron, G. (2019). Zanzibar in the Tanzania Union. In Secessionism in African Politics. Palgrave Macmillan, UK.

an executive president. The Government of the United Republic of Tanzania is operating through three arms: the Executive, including the President, Vice President, Prime Minister and the Cabinet, the Parliament and the Judiciary. The President is elected by direct popular vote every five years, and permitted to serve a maximum of two, five-year terms. The President appoints the Prime Minister, who serves as the government leader in the Assembly, selects the cabinet from the National Assembly, and nominates ten non-elected members of parliament who can serve in the cabinet.

Zanzibar is a semi-autonomous part of Tanzania, with its own president, devolved government and legislature. The President of Zanzibar is the head of the Revolutionary Government of Zanzibar. Zanzibar's House of Representatives consists of 50 directly elected members[182]. The House is responsible for legislation on domestic matters and, in practice, external trade. The President of Zanzibar also appoints the chief justice and judges, judges of appeal with the advice of the Chief Justice, and High Court judges with the advice of the Judicial Services Commission. The Court of Appeal is the supreme court and the final appellate court, and is presided over by the chief justice. Other more specialized courts include the Commercial Court and the Land Court.

Economy

The economy of Tanzania is a lower-middle income economy, with a total GDP of USD 67.8 Billion in 2021. Agriculture, mining and tourism are the main drivers of Tanzanian's economy. Agriculture contributes to around 30 % of GDP and employs about 65% (almost 8 million) of the workforce[183]. Tanzania is also a land rich in minerals. Mining makes up more than 50%[184] of the total exports of the country, of which a large part comes from gold. The country exported gold valued at more than USD 2.7 billion between April 2021 and 2022[185]. The Tanzanian Government

[182] Electoral Institute for Sustainable Democracy in Africa (EISA). (2022). Zanzibar: Constitution. https://www.eisa.org/wep/zan5.htm

[183] Word Bank. (2022). Tanzania overview. https://www.worldbank.org/en/country/tanzania/overview

[184] The Citizen. (2019). Trading centres boost Tanzania's mining sector. https://www.thecitizen.co.tz/tanzania/news/national/trading-centres-boost-tanzania-s-mining-sector-2693818.

[185] Statista. (2022). Export value of goods in Tanzania from 2021 to 2022. https://www.statista.com/statistics/1142447/export-of-goods-into-tanzania-by-category/

plans to have the mining sector contribute 10% of the GDP by 2025[186]. However, traditional exports, such as coffee, tea, sisal, and cashew nuts generated over USD 700 million in the same period. Also, Tanzania is home to rich nature and wildlife, which attracts tourists, boosting the country's services industry. Revenue from tourism for the 12 months ending April 2022 was USD 1.5 billion.

Tanzania demonstrates macroeconomic stability. It has tremendous potential for growth but suffers from corruption, poverty, social inequality and a lack of modern infrastructure. In 2020, the poverty rate in the country was estimated at some 25 percent. A third of Tanzanian workers lived on less than USD 1.9 per day according to the data of 2020 from the World Bank[187], highlighting the country's challenge to promote more inclusive economic development. Nonetheless, its favourable position allows it to earn significant revenues from foreign trade.

9.2 Maritime profile

Shipping industry

Tanzania's coastline stretches approximately 1,425 km across East Africa. This permits Tanzania to transform its economy and vitalize the movement of goods over the East African region.

In particular, Tanzania hosts the most strategic port in East Africa, Dar es Salaam Port. The port handles about 95 percent[188] of the country's international trade, serving other landlocked countries, including Malawi, Zambia, DRC, Burundi, Rwanda and Uganda. In addition to Dar es Salaam, Mtwara and Tanga also are important ports in Tanzania. Products transiting Tanga port are mostly agricultural and local industry materials, while Mtwara port is emerging as an anchorage port for the offshore oil and gas discoveries. However, in general, a high proportion

[186] Tanzania Investment center. (2022). Mining sector. https://www.tic.go.tz/sectors/mining-sector

[187] Word Bank. (2020). Poverty & Equity Brief Tanzania. https://databank.worldbank.org/data/download/poverty/

[188] Tanzania Ports Authority. (2022). Dar es Salaam and Central Coast Sea Ports. https://www.ports.go.tz/index.php/en/dar-es-salaam-port#:

of the port infrastructure and equipment has not been modernised over time due to limited resources and consequently operating beyond its economic life[189].

According to UNCTAD maritime key figures, as of 2020, Tanzania flagged 322 ships with a total of 73,000 deadweight tonnes (Figure 9.3).

Figure 9.3. Maritime profile of Tanzania (UNCTAD, 2021)

The government of Tanzania has been on a mission to transform the maritime sector physically and financially. For instance, in July 2017, the government launched the Dar es Salaam Maritime Gateway project, with USD 421.3 million targeted to fully exploit the port's potential[190]. According to its Five-Year Development Plan II (2016/17-2020/21), by 2050, up to 60% of aggregate global trade will be shipped through the Indian ocean and Tanzania is strategically positioned to harness business opportunities and emerge as a leading shipping hub[191].

The biggest trade partners of Tanzania include India, UAE, Saudi Arabia, China and Switzerland.

Passenger transportation in inland waters

Inland water transport in the mainland is an important marine activity sustaining socio-economic development in Tanzania. Inland waterways are part of the country's strategic trade corridor. Lake Victoria, Lake Tanganyika and Lake Nyasa link Tanzania with its neighbouring countries making the country an international gateway for its landlocked neighbours. Burundi, Rwanda,

[189] Tanzania-Transport Sector Review, 2013. African Development Bank Group. https://www.afdb.org/

[190] Further Africa. (2021). Tanzania maritime sector eyes more cargo on busiest port. https://furtherafrica.com/2021/03/05/tanzania-maritime-sector-eyes-more-cargo-on-busiest-port/

[191] Ministry of Finance and Planning. (2016). National Five Year Development Plan 2016/17-2020/21 Report. https://www.cabri-sbo.org/uploads/bia/tanzania_2016_planning_external_national_plan_author_region_english_.pdf

Uganda, DR Congo, Zambia and Malawi are all dependent to some extent on Tanzania's inland water transport network for access to global markets.

In addition to the lakes, some of the major rivers that run across Tanzania are the Nile (4,258 miles, shared with ten other countries), River Congo (2,920 miles, shared with nine other countries), River Rufiji (373 miles), and River Ruvuma (497 miles, shared with Mozambique)[192]. Not all of these rivers are navigable due to many reasons, including high level of siltation, and insufficient depth and width. Rufiji River, the largest in the country, draining most of the southern part of the country is navigable for about 60 nm (Figure 9.4).

Figure 9.4. Passenger and cargo transport on Rufiji River [193]

Tanzania has many inland ports and waterways managed by the Tanzania Port Authority.

Lake Victoria located in the Northern borders is the biggest lake in Africa, covering the territories of Tanzania, Uganda and Kenya. Around 20 ports are located along the shore of the great lake including the Tanzanian ports of Mwanza, Kemondo, and Bukobo. Situated in the Kigoma region is the world's second-oldest freshwater lake called Tanganyika (Southwestern border), which

[192] World Atlas. (2017). Major Rivers of Tanzania. https://www.worldatlas.com/articles/major-rivers-of-tanzania.html

[193] Al-Monitor. (2020). Egypt's project in Tanzania refutes Ethiopia's accusations. https://www.al-monitor.com/originals/2020/06/egypt-tanzania-project-ethiopia-nile-dam-dispute.html#ixzz7bTSa41gr

houses 15 small port facilities including Kigoma port and Kasanga[194] (Figure 9.5). The main ports on Lake Nyasa (Southern border) are the Mbamba harbour and Itungi port which is a cargo terminal. Most of the inland ports were built around the 1930s. The ports are currently undergoing significant modernization to improve their capacity to handle more cargo.

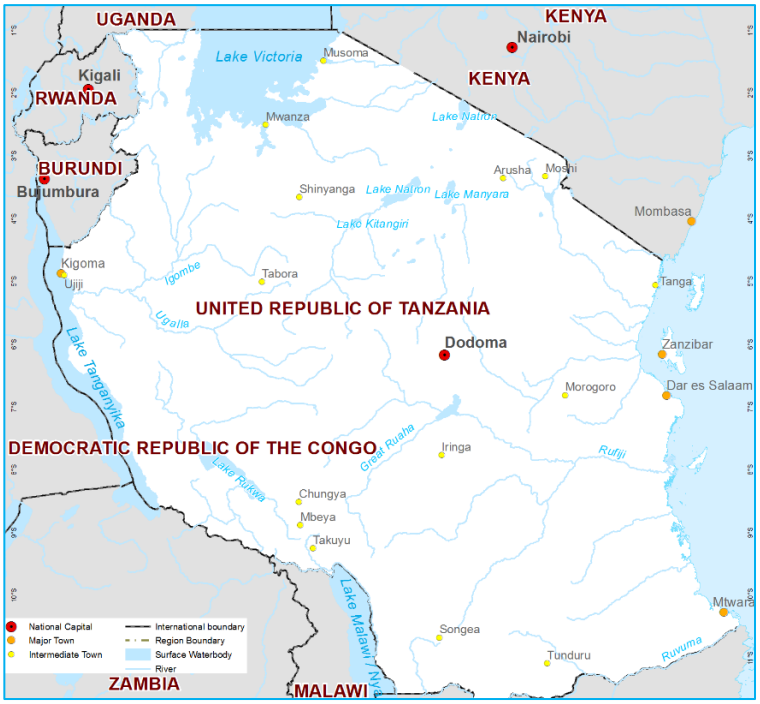


Figure 9.5. Tanzania waterways network

Passenger transportation in Zanzibar archipelago

Tanzania has a long history in the transport of trains, cargo and passengers by ferry. The first ferry on Lake Victoria started operation in 1900 during the British colonial era. To date, almost all ferries in operation are decades old.

Local users constitute a very small fraction of the passengers availing of ferry services. Over 99% of the ferry passengers in Zanzibar are foreign tourists from around the world who visit the country to experience the amazing islands.

[194] World Food Programme/Logistics Cluster. (2020). Tanzania Waterways Assessment. https://dlca.logcluster.org/display/public/DLCA/2.5+Tanzania+Waterways+Assessment

In Tanzania, traditional dhow boats or locally built boats known as “Mitumwbi/Madau” and “Ngalawa” are still in use[195] and operate alongside modern ferries.

Fast Ferries Limited is the largest passenger ferry company in Tanzania. In operation since 2018, the company provides local ferry services to around 3,000 passengers daily[196].

Most ferries in Zanzibar are owned by private investors. The total number of domestic passenger ships registered with the Zanzibar Maritime Administration and operating within Tanzanian waters classified as per ship type and ship size is presented in Table 9.1. In total, 424 domestic passenger ships are registered in Zanzibar. 406 of the 424 ships (95.8%) are wooden and fiberglass-hulled crafts, mostly designed and built using traditional methods and techniques based on experience handed down over generations. Additionally, 408 of the 424 ships (96.3%) are smaller than 50 Gross Tonnage (GT).

Table 9.1. Number of domestic passenger ships by type and size in Tanzania Zanzibar

Ship type	**Number of ships in 2021**	**Percentage of total fleet**
High Speed Crafts	6	1.4%
Ro-Ro Passenger	4	0.9%
Passenger Ferry	2	0.5%
Passenger Cargo	1	0.2%
Wooden crafts	306	72.2%
Fiberglass crafts	100	23.6%
Aluminium crafts	5	1.2%
Ship size	**Number of ships in 2021**	**Percentage of total fleet**
Ship < 50 GT	408	96.3%
50 GT ≤ Ship < 100	1	0.2%
100 GT ≤ Ship < 500	6	1.4%
500 GT ≤ Ship	9	2.1%

(Source: Questionnaire response)

According to the inputs received in the questionnaire, more than 1.7 million passengers were transported by domestic passenger shipping in 2021.

[195] Suleiman, M. (2016). Pragmatic Analysis of Safety and Security in Tanzania Maritime Logistics: Evidence from Zanzibar Passenger Ferry Boat, Tanzania. International Journal of Economics, Commerce and Management 4 (7), 1-14.

[196] Zan Fast Ferries. (2022). Milestones. https://zanfastferries.co.tz/

Major long-distance (more than 12 nm) passenger transport routes are Zanzibar-Dar es Salaam, Zanzibar-Pemba and Pemba-Tanga routes (Figure 9.6). On the other hand, Mkokotoni-Tumbatu, Wete-Fundo, Mkoani-Makoongwe, Chokocho-Kisiwa Panza, and Malindi-Prison Island routes are short-distance (less than 12 nm) major domestic ferry routes and services.

Figure 9.6. Examples of major domestic shipping routes in Tanzania (copyright authors)

9.3 Maritime regulatory framework in Tanzania

General overview of maritime regulators and regulations

Regulatory entity

Maritime is a non-Union subject. Consequently, there are two different entities in the United Republic of Tanzania dealing with the regulation of the maritime industry.

In mainland Tanzania, the Surface and Marine Transport Regulatory Authority (SUMATRA) established under the Surface and Marine Transport Regulatory Authority Act, 2001 is the regulatory entity for rail, road and maritime transport services in Tanzania. Thereafter, a variety of policy reasons, including input from maritime stakeholders led to the creation of the Tanzania

Shipping Agencies Corporation (TASAC)[197] to regulate maritime transport in particular for dealing with matters of maritime administration, maritime environment, safety and security, maritime transport services at seaports and inland waterways.

On the other hand, in Tanzania Zanzibar, the Revolutionary Government of Zanzibar, through the Zanzibar Maritime Administration (ZMA)[198] and Maritime Transport Act regulates maritime transport, which applies to Tanzania Zanzibar registered ships. The ZMA was established under Act No.3 of 2009 of the House of Representatives and charged with the responsibility of monitoring, regulating and coordinating activities in the maritime industry in Zanzibar.

Registration of ships

Tanzanian ships are registered under the Merchant Shipping Act 2003, while Tanzania Zanzibar ships are registered under the Maritime Transportation Act 2006. The ships registered under either of the acts are entitled to fly the flag of the United Republic of Tanzania[199].

Tanzania mainland has a closed ship registry. Ship registration is limited only to Tanzanian nationals. Tanzania Zanzibar is an open registry and allows foreign individuals and companies to register vessels under the Tanzania Zanzibar International Register.

One of the important points emphasized by the interviewees and studies in the literature, regarding maritime regulators and regulations, is the necessity of addressing the challenges emerging from having two maritime authorities for ships flying the same flag. There are many stakeholders involved in the Tanzanian maritime sector, including ten ministries and several sectors covering operations, management, infrastructure, and policy formulation. Therefore, any one entities' decision has the potential to affect the performance of others. This has resulted in the absence of Tanzanian registered merchant ships and this has affected the country in many ways, including the loss of critical and strategic public and private sector maritime expertise, a commercial maritime service capacity, industrial capacity, etc.

[197] TASAC, 2022. Tanzania Shipping Agencies Corporation, website: https://www.tasac.go.tz/

[198] ZMA, 2022. Zanzibar Maritime Administration, website: https://www.zma.go.tz/

[199] Salum, M. M., 2019. A critical analysis of ship registration system in the United Republic of Tanzania. World Maritime University, Sweden.

Regulatory framework

A list of applicable maritime regulatory frameworks of Tanzania Shipping Agencies Corporation (TASAC) for Tanzania mainland registered fleet is presented at Table 9.2.

Table 9.2. Maritime regulatory framework in Tanzania mainland

- The Tanzania Shipping Agencies (Shipping Business Fees, Charges & Commission) GN. 181 (2021);
- The Tanzania Shipping Agencies Act, Cap.415;
- The Merchant Shipping Act, Cap.165;
- The Tanzania Ports Act No.17 of 2004;
- The Merchant Shipping (Registration & Licencing of Vessels Regulations, 2005);
- The Merchant Shipping (Musters, Training and Decision Support Systems) Regulations, 2019;
- Merchant Shipping Notice 2420 Coronavirus (COVID-19) – Extension of the Validity of Documents and Certificates of Seafarers Issued by the United Republic of Tanzania;
- Merchant Shipping Notice 2319 Schedule for Oral Examination;
- Merchant Shipping Notice 1814 Seafarer Medical Examination System and Approved Medical Practitioners;
- Merchant Shipping Notice 1713 (Procedures for the Use of Privately Contracted Armed Security Personnel on Board Ships While ın Tanzanian Ports or Coastal Waters;
- Merchant Shipping Notice 1513 (Guidelines for the Implementation of 2010 Manila Amendment of the International Convention on Standards of Training, Certification and Watch Keeping for Seafarers (STCW));
- Merchant Shipping Notice 0607 (Measures to Enhance Maritime Security for Ships at Anchorage Areas or Drifting in Approaches to Ports);
- Merchant Shipping Notice 0507 Amendment 1/2020 (Effect of Declining Water Levels in Lake Victoria to the Safety of Navigation); and
- MS (Ship and Port Facility Security) Regulations, GN 213 - 2004.

A list of applicable maritime regulatory frameworks of Zanzibar Maritime Administration (ZMA) for Tanzania Zanzibar registered fleet is presented at Table 9.3.

Table 9.3. Maritime regulatory framework in Tanzania Zanzibar

- The Zanzibar Maritime Authority Act No. 3 of 2009;
- Maritime Transport Act No.5 of 2006;
- Zanzibar Maritime Transport Act No. 3 of 2009;
- Zanzibar Ports Corporation Act No. 1 of 1997;
- Zanzibar Environmental Management Authority Act No.3 of 2015;
- Zanzibar Utilities Regulatory Authority Act No. 7 of 2013;
- Zanzibar Disaster Risk Reduction and Management Act No. 1 of 2015;
- Land Survey Act No.9 of 1990;
- The Maritime Transport (Registration and Licensing of Vessels) Regulations;
- The Small Ships Safety Regulations (LN.25);
- Maritime Transport (Seaman's Record Book and Identity Card) Regulations;
- The Maritime Transport (Fees and Charges) Regulations;
- The Safe Manning Regulations (LN.23);
- The Ship and Port Facility Security Regulations (LN.19);
- The Carriage of Dangerous Goods Regulations (LN. 8);
- The Crew List Regulations (LN.7);
- The Deck Cargo Regulations (LN.9);
- The Inquiry of Conduct of Seafarers Regulations (LN.10);
- The Limitation of Liability for Maritime Claims (LN.11);
- The Load Lines Regulations (LN.12);
- The Marine Navigational Aids Regulations (LN.15);
- The Official Log Book Regulations (LN.18);
- The Port Reception Facility for Ship Generated Wastes and Cargo Residues Regulations (LN.21);
- The Prevention of Collision and Distress Signals (LN.20);
- The Regulations for Prevention of Oil Pollution (LN.16);
- The Repatriation and Relief of Seafarers Regulations (LN.22);
- The Rules for Marine Inquiry and Formal Investigation (LN.14);
- The Seafarers Engagement Regulations (LN.24);
- The Seafarers Medical Examination (LN.17);
- The Stowaway Regulations (LN.26);

- The Timber Cargo Regulations (LN.27);
- The Tonnage Measurement Regulations (LN.28);
- The Wreck and Salvage Service Regulations (LN.29);
- The High-Speed Craft Regulations (LN.30);
- The Survey and Certification Regulations (LN.31); and
- The ISM Code Domestic Regulations (LN.32).

Governance of domestic passenger vessel transport

In mainland Tanzania, Tanzania Shipping Agencies Corporation (TASAC) established under Tanzania Shipping Agencies Act (Cap. 415) is the primary responsible authority, regulating domestic water transport through the Merchant Shipping Act of 2003. In Tanzania Zanzibar, domestic water transport is administered by the Zanzibar Maritime Administration (ZMA) in accordance with the provisions of the Zanzibar Maritime Transport Act of 2006. Together, these two acts are paramount in ensuring the safety of domestic passenger ships in the respective jurisdictions.

All vessels above 500 GT registered to carry passengers under ZMA and TASAC are obliged to comply with the requirements of the international convention standards for safety of life at sea (SOLAS) and the International Safety Management (ISM) Code.

As per the field research outcomes, flag State obligations, including inspection, survey, ships and crew certification, and accident investigation are separately ensured by both administrations for the respective fleet. Detention regulations are also in place to disincentivise non-compliance and violations.

However, one of the most important issues frequently emphasized in the literature is that despite the rules and regulations, implementation and enforcement are lacking. One of the reasons for the lack of safety is the tendency on part of some of the ferry operators, crew members and passengers to routinely violate rules and regulations, especially with regard to the maximum number of passengers embarked onboard, quality of the vessels and provisioning of lifesaving

materials onboard[200, 201]. High inadequacy of technical personnel poses severe limitations in enforcement of safety standards onboard flagged vessels. For example, only seven surveyors are available with ZMA, of which only one is a freshly qualified naval architect.

Another issue frequently mentioned in literature is that the existence of two different maritime regulatory entities (TASAC and ZMA) can create lack of harmonization in the regulation and enforcement mechanism. However, personal interview highlighted the availability of structured cooperation mechanism between TASAC and ZMA with coordination meetings between the two counterpart authorities being held once every three months. Similar cooperation reportedly prevails at the operational level.

Flag State control

Survey and certification of registered ships are within the purview of respective administrations namely, TASAC for ships registered in Tanzania mainland and ZMA for ships registered in Tanzania Zanzibar. Statutory certification is retained by TASAC and ZMA. Both authorities issue statutory certificates on behalf of the Union. The statutory survey is delegated by ZMA in respect of the ISM Code and Radio Regulations.

Further, ships registered with TASAC are subject to flag State control through inspections by ZMA when calling at ports in Zanzibar and vice versa. Any findings, non-conformities, etc. arising from such inspections are immediately brought to the notice of the concerned administrative authority to ensure that the ship is maintained in compliance with the prevailing requirements.

Port State Control

Both TASAC and ZMA undertake Port State Control of foreign flagged ships calling at ports in their respective jurisdictions on behalf of the United Republic.

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[200] Suleiman, M., 2016. Pragmatic Analysis of Safety and Security in Tanzania Maritime Logistics: Evidence from Zanzibar Passenger Ferry Boat, Tanzania. International Journal of Economics, Commerce and Management 4 (7), 1-14.

[201] Temba, G. (2012). Ferry passenger's satisfaction: An empirical assessment of the influence of ferry route type (online), Accessed 2nd December, 2015 at: http://brage.bibsys.no/xmlui/bitstream/handle/11250/153674/master_temba.pdf?sequence=1.

9.4 Domestic ferry accidents in Tanzania

Trends in accidents

The trends in the number of casualties is amongst the foremost of the indicators of the level of safety, and as per the accident dataset, the annual number of reported fatal accidents in Tanzania reflects a decreasing trend (Figure 9.7).

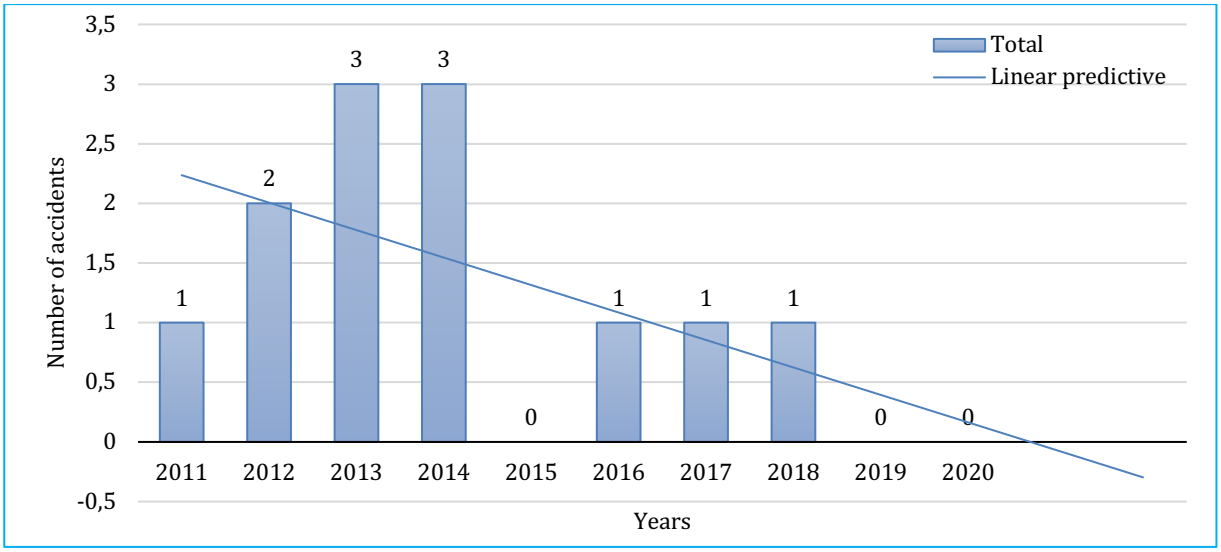

Figure 9.7. Trend of accidents in Tanzania: 2011-2021 (Source: Arcsilea)

Further, according to the dataset, in 2019 and 2020 there were no fatal domestic passenger ship accidents. A quick desktop review, however, revealed that Tanzania was not free from domestic ferry accidents in 2019 and 2020. On 28 May 2019, a passenger ferry carrying 400 to 500 of people capsized on Lake Victoria in Tanzania, as a result of which at least 44 people lost their lives[202]. Similarly, on 31 July 2020, a passenger ferry carrying 97 passengers reportedly capsized in Lake Tanganyika, due to strong winds[203] (Figure 9.8).

[202] The Free Press Journal, 2019. Tanzania: 44 dead in passenger ferry accident. https://www.freepressjournal.in/cmcm/tanzania-44-dead-in-passenger-ferry-accident

[203] Anadolu Agency, 2020. Ferry capsizes in Tanzania, 10 feared dead. https://www.aa.com.tr/en/africa/ferry-capsizes-in-tanzania-10-feared-dead/1928459

Figure 9.8. Example of fatal domestic ferry accidents in Tanzania

Causal factors of accidents

The United Republic of Tanzania has experienced twelve accidents in the last decade that resulted in 3,634 fatalities. The high death toll is attributed to the catastrophic accident in 2011, wherein the *mv Spice Islander* sank enroute from Unguja to Pemba Island resulting in 2,976 deaths. Yet another accident with high fatalities was the *mv Nyerere* that capsized in 2018 while on voyage from Ukerewe to Ukara on Lake Victoria. Tanzanian officials report that 228 people died as a result of the accident, while 41 were rescued.

Due to the number of fatal maritime accidents in Tanzania, safety and security are of paramount importance.

The most cited causes in the literature [204, 205, 206, 207] leading to accidents in Tanzania include overloading, lack of adequate life-saving appliances for passengers, inadequate maintenance and survey of vessels, complacence of port supervisors, lack of safety officers and inadequate

[204] Suleiman, M., 2016. Pragmatic Analysis of Safety and Security in Tanzania Maritime Logistics: Evidence from Zanzibar Passenger Ferry Boat, Tanzania. International Journal of Economics, Commerce and Management 4 (7), 1-14.

[205] Temba, G. (2012). Ferry passenger's satisfaction: An empirical assessment of the influence of ferry route type (online), Accessed 2nd December, 2015 at: http://brage.bibsys.no/xmlui/bitstream/handle/11250/153674/master_temba.pdf?sequence=1.

[206] The Free Press Journal, 2019. Tanzania: 44 dead in passenger ferry accident. https://www.freepressjournal.in/cmcm/tanzania-44-dead-in-passenger-ferry-accident

[207] Anadolu Agency, 2020. Ferry capsizes in Tanzania, 10 feared dead. https://www.aa.com.tr/en/africa/ferry-capsizes-in-tanzania-10-feared-dead/1928459

inspectors to survey the vessels operating in the Indian Ocean and unsafe practices of ship owners and operators.

As per the Arcsilea database which formed the basis of this study, the most frequently reported accidents were capsizing and sinking, followed by operational failure, which together represented 92% of the total accidents (Figure 9.9).

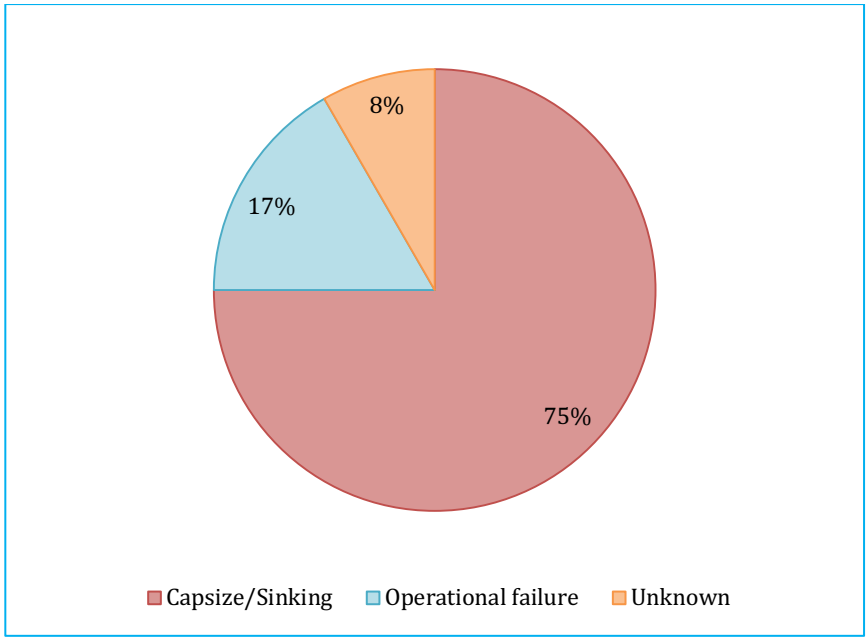

Figure 9.9. Percentage distribution of ferry accidents in Tanzania: 2011-2021 (Source: Arcsilea)

Geographic distribution of waterways accidents

The geographical distribution of domestic ferry accidents between the mainland and archipelago indicates that 58% of the accidents occurred in the Tanzania mainland waters, and the remainder 42% occurred in Tanzania Zanzibar waters.

In Tanzania Mainland waters, accidents occurred more frequently on routes on Lake Victoria (Ukara-Ukerewe, Nansio-Mwanza; Mwanza-Burundi), Lake Tanganyika (Tanzania-Burundi; Kigoma-Mupulungu) and Lake Malawi (Mbamba Bay-Nkhata Bay). In addition to the lake routes, accidents also occurred on the Tanga-Pemba Island and Panguni-Zanzibar routes. In Tanzania Zanzibar waters, accidents occurred more frequently on the Pemba-Zanzibar Island, Unguja-Pemba, and Zanzibar-Dar es Salaam routes (Figure 9.10). The areas and routes more prone to

domestic ferry accidents are an important consideration when determining the priority areas for safety intervention.

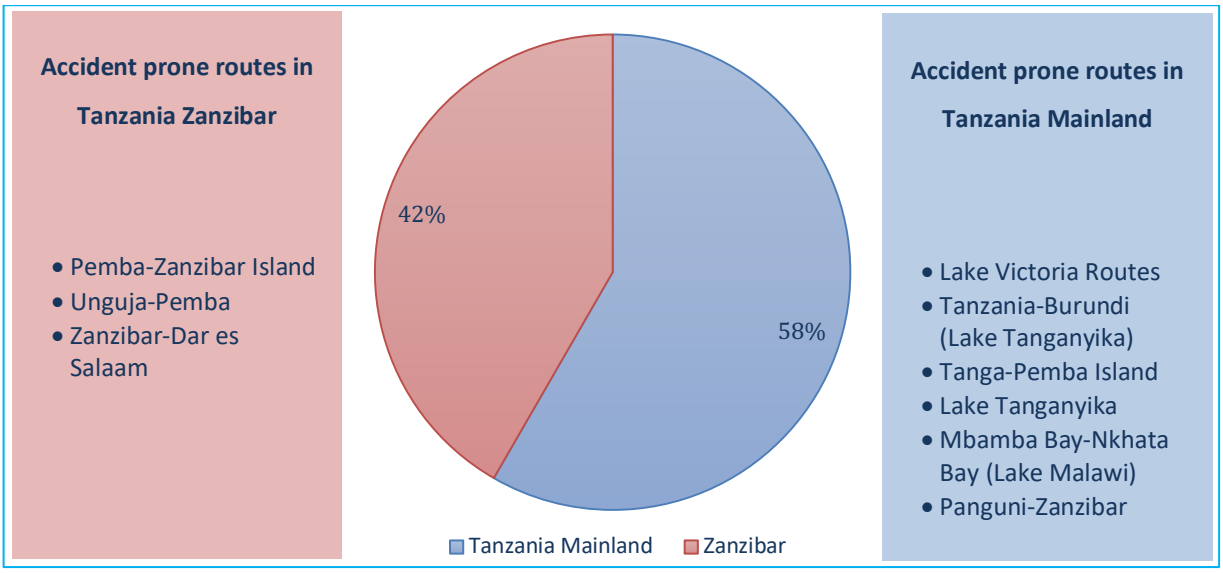

Figure 9.10. Percentage distribution of ferry accidents in Tanzania by location: 2011-2021 (Source: Arcsilea)

10 EVALUATION MATRIX OF FERRY SAFETY

This section presents the evaluation of domestic ferry safety for the seven high-risk countries.

10.1 Maritime Profile Index

This sub-section presents an evaluation of the domestic passenger fleet size, national population, and the length of navigable routes in respect of the seven select countries.[208]

Domestic ferry fleet

The impact of any safety intervention would have a direct benefit in relation to the size of the domestic ferry fleet; the larger the number of ferries, the greater will be the impact. Therefore, in this study, a larger fleet is evaluated positively based on the fleet size.

In estimating the size of any flagged fleet, a national vessel registration database should ideally serve as the primary source. However, unlike international shipping, a vessel registration system is not strictly implemented for domestic shipping. Consequently, the precise number of domestic passenger vessels is largely unknown. Uncertainty as to the exact numbers of domestic passenger vessels appeared to be common to all countries examined. Hence, a better appreciation of the numbers was gained by reviewing the current statistics in conjunction with the estimates provided orally by the interview participants and maritime administrations. Therefore, in all probability, the actual fleet size should be expected to be larger than the numbers stated here.

Based on the domestic passenger fleet sizes of all examined countries, considering both registered and unregistered vessels, Bangladesh appears to have the largest fleet with over 700,000 vessels. Further, from the interviews, it emerged that the number of traditional ferries working in both Indonesia (more than 15,000) and Nigeria (more than 10,000) is also relatively high. These relatively smaller fleet sizes in Indonesia and Nigeria take no account of smaller unregistered vessels, which are not reflected in official records (see Table 10.1).

National population

Just as with fleet size, the larger the size of the domestic ferry users and the higher the proportion of the national population dependent on domestic ferries as a means of daily transportation, the

[208] Detailed information presented in Sections III-IX.

greater will be the impact of any potential safety intervention. Therefore, the percentage of any population using domestic ferries is a metric of interest for this study.

However, official domestic ferry passenger records and statistics were unavailable in any of the countries examined. Hence, possible outcomes in terms of passengers requiring and using the domestic passenger ferry systems could not be measured. To address this gap in data, the assumption is that more populated countries would have more people demanding domestic ferry services. Therefore, a greater population was considered a positive aspect given a relatively higher proportion of the population would stand to benefit from any safety intervention.

Indonesia, Nigeria, Bangladesh and the Philippines respectively have the highest population among the countries examined (see Table 10.1).

In addition, interviews revealed initiatives of the governments of Nigeria and Bangladesh such as dredging, investment in berthing infrastructure, etc. with the aim to promote inland water transport so as to reduce the load on land traffic.

Size of navigable waters

The size of navigable waters in riverine States and, similarly the number of inhabited archipelagic islands in a country and their populations, have a direct bearing on the development potential of domestic ferry transportation and, therefore, serve as an excellent metric for the impact of any potential safety intervention.

In terms of navigable river lengths, the Democratic Republic of Congo (17,000 km), the United Republic of Tanzania (14,000 km), Nigeria (10,000 km), and Bangladesh (5,968 km) have among the longest rivers (see Table 10.1).

As such, interviews confirmed that a main focus area of the national government in these riverine countries is to connect cities and towns with efficient, inland waterways transportation systems as an alternative to other modes of transportation.

On the other hand, in archipelagic countries, the provision of domestic ferry services is an inescapable necessity, as the distances are too short for air transport (inefficiency) and, the high number of remote islands vis-à-vis relatively smaller numbers of inhabitants make it cost prohibitive for connection with roads and bridges. Therefore, a clear understanding of the demand and need for maritime transport in archipelagic countries is identifiable in a relatively

more straightforward manner by examining the number of inhabited islands and their populations. Among the countries examined, Indonesia (17,000 islands), the Philippines (7,600 islands) and the United Republic of Tanzania (Zanzibar and Mafia archipelagos) have an overly high reliance on passenger transportation by sea and, therefore, domestic ferry transportation merits a continuous focus in these countries (Table 10.1).

Table 10.1. Summary of maritime profile indicators of the countries examined

Country	Domestic passenger fleet	Population	Size of navigable waters
Bangladesh	752,000 vessels	168 M (2022)	• 5,968 km inland • 720 km coastline
DRC	10,988 vessels	92 M (2021)	• 17,000 km inland • 40 km coastline
Indonesia	1,006 vessels	270 M (2022)	• 17,000 islands (archipelago) • 95,000 km coastline
Nigeria	Unknown (> 10,000)	217 M (2021)	• 10,000 km inland • 850 km coastline
Senegal	Unknown (> 1,000)	17.7 M (2022)	• 1,000 km inland • 530 km coastline
The Philippines	12,088 vessels	112 M (2022)	• 7,600 islands (archipelago) • 36,289 km coastline
Tanzania	1,077 vessels	61.5 M (2021)	• 14,000 km inland • Zanzibar/Mafia archipelago • 1,425 km coastline

10.2 Accident and Safety Index

Incidence of accidents and the trend

The safety situation in each country in terms of domestic ferry accidents is identified in this study with reference to three parameters:

- total number of accidents recorded for the period 2011-2021;
- composite of fleet size, accident reporting culture, and accidents; and
- the trend of accident numbers in the last ten years.

In the database for this study, 401 fatal ferry accidents were recorded globally for the period 2011-2021, of which 208 or over half of the accidents occurred in the seven countries included in the scope of this study. This already makes the countries examined in this study, worthier of a safety intervention than the rest of the world (see Figure 10.1).

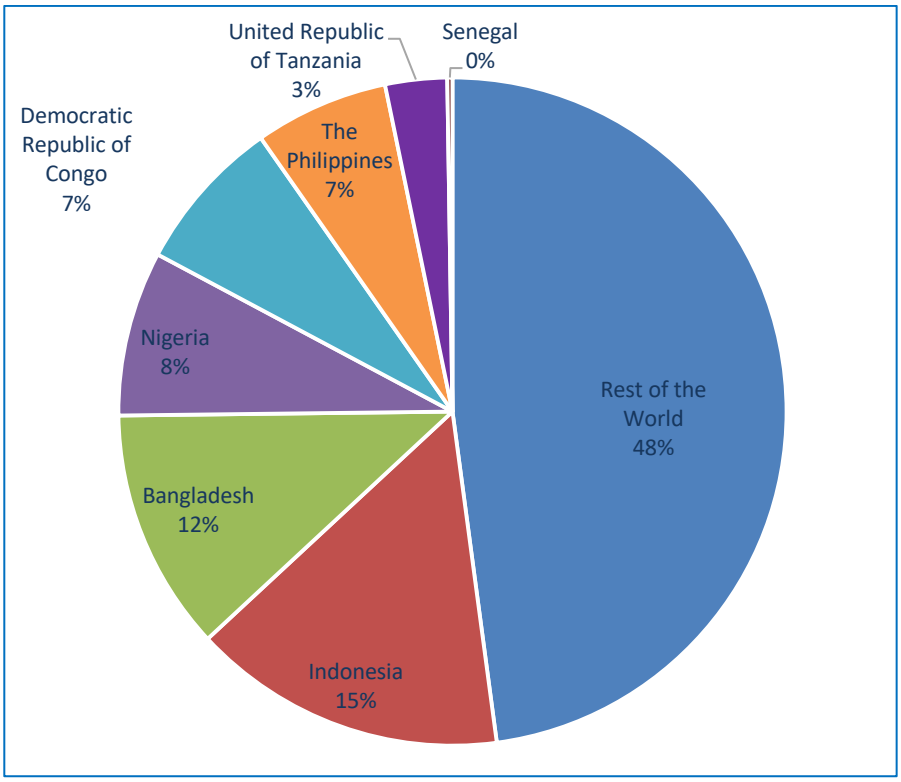

Figure 10.1. Distribution of accidents among the countries examined: 2011-2021

Consideration of fleet size (Table 10.1), accident reporting culture (interviews, qualitative), and accidents occurring over the last decade in these seven countries (Figure 10.1) taken together helps to provide perspectives on the potential impact and success of any safety intervention in the country.

The trend of accident numbers is an inescapable imperative for measuring safety performance for all countries and is specifically emphasized by the International Maritime Organisation. When the trend of accident numbers in the last ten years was examined, Nigeria and the Democratic Republic of the Congo demonstrated a moderate increase and, Indonesia a slight increase, Philippines recorded a slight decrease and, both United Republic of Tanzania and Bangladesh achieved a moderate decrease in the number of accidents. No conclusion could be made for Senegal due to the lack of statistical data (Sections 3-9).

Common types of accidents and severity of the consequences

It is a known fact that different types of accidents such as allision, collision, capsizing, fire, grounding, etc. will have differing consequences for the safety of life, property and the environment. In addition, the formation patterns of different types of accidents and the causes and causal factors contributing to their occurrence would also be different. These differences

require specific approaches and interventions when preventing accidents or considering any safety intervention. This study, therefore, examines the types of accidents that occurred frequently in the seven countries of interest and the severity of their consequences. The resulting frequency distribution of accidents for each country for the period 2011-2021 based on the type of initial event is presented in Figure 10.2.

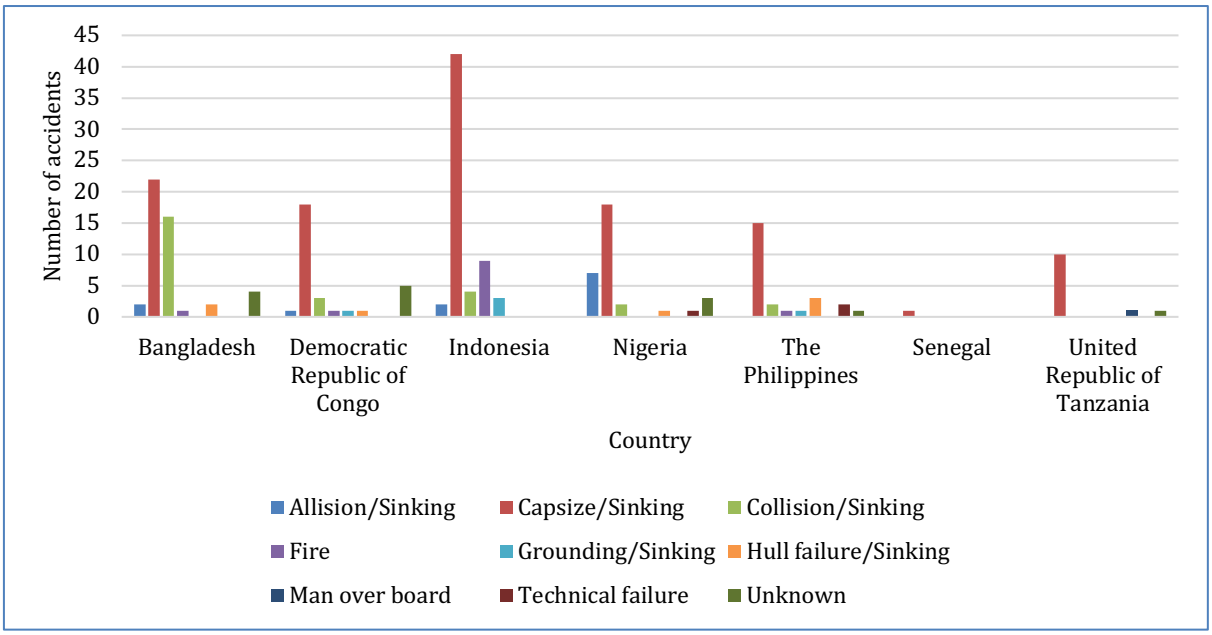

Figure 10.2. Distribution of accidents among the examined countries by type of initial events: 2011-2021

Among the countries studied, capsize followed by sinking is the most frequently observed accident type, and invariably resulted in a total loss of the vessel, with an overly optimistic assumption that all passengers and crew were rescued after the occurrence. The most frequently observed causes and causal factors that lead to capsizing accidents are overloaded vessels, cargo displacement, loss of stability, mass movement of passengers and loss of power coupled with bad weather conditions, and unseaworthy ships, and in particular, operating ships in conditions that exceeded their design limits.

When the severity of consequences in terms of number of fatalities is analysed by accident type, the number of fatalities per accident in the last decade for each country is as follows: Bangladesh - 34 fatalities/accident; the Democratic Republic of the Congo - 71 fatalities/accident; Indonesia - 25 fatalities/accident; Nigeria - 26 fatalities/accident; the Philippines - 24 fatalities/accident; Senegal - 20 fatalities/accident; and, Tanzania - 303 fatalities/accident (Figure 10.3).

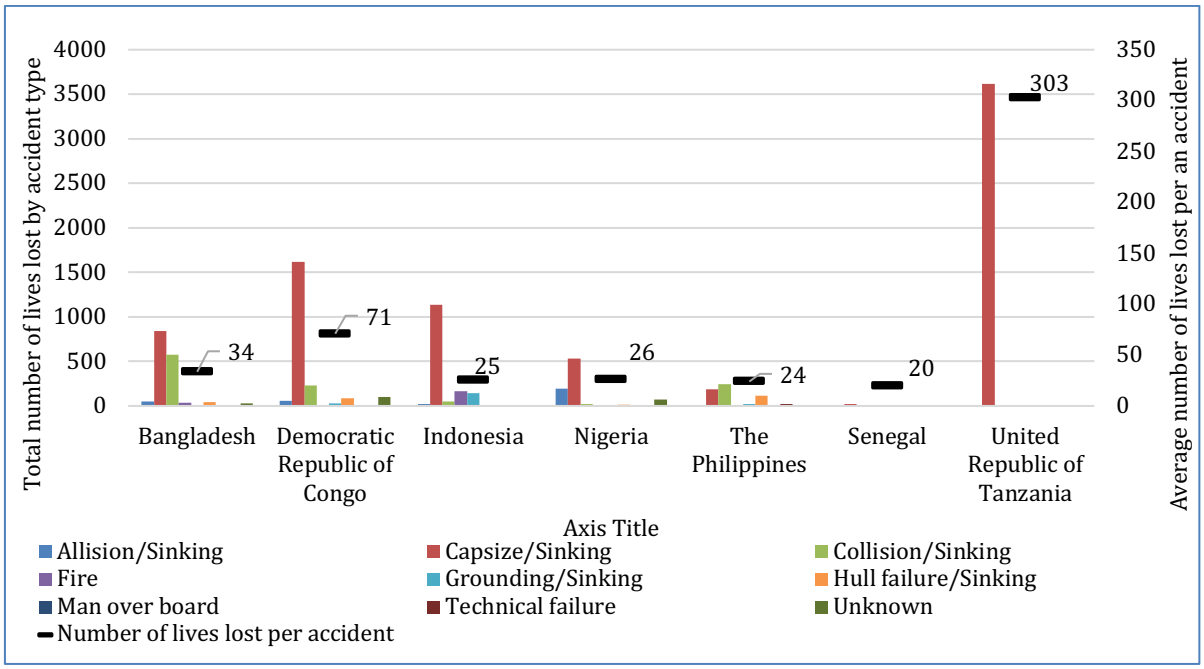

Figure 10.3. Distribution of total lives lost among the examined countries by type of accident: 2011-2021

Although the lives lost per accident gives a high-level overview, it should be highlighted that catastrophic accidents resulting in over 1,000 fatalities occur infrequently, maybe once a hundred years and even more rarely, and can result in countries becoming outliers. The *Spice Islander* accident with 2,976 fatalities, for example, makes Tanzania an outlier in any 10-year or 20-year period that includes this accident.

Regulatory quality

In this study, the regulatory quality is taken into consideration by referring to one of the global indices to avoid subjectivity and ensure a harmonized and consistent approach across countries. Regulatory quality index[209] is one of the six Worldwide Governance Indicators (WGI)[210]. It offers a quantitative measure[211] of the quality of a country's primary laws and subordinate legislations.

[209] The World Bank. (2022). TC Data 360. Regulatory quality. https://tcdata360.worldbank.org/indicators/51ada6ba?country=BGD&indicator=40283&countries=COD,IDN,NGA,PHL,SEN,TZA&viz=line_chart&years=2013,2020

[210] The Worldwide Governance Indicators (WGI) are a research dataset summarizing the views on the quality of governance provided by a large number of enterprises, citizens and expert survey respondents in industrialised and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms. WGI are produced by: Daniel Kaufmann, Brookings Institution and Aart Kraay, World Bank.

[211] Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: methodology and analytical issues. Hague journal on the rule of law, 3(2), 220-246.

WGI is based on over thirty different individual data sources, capturing the views and experiences of survey respondents, experts in the public and private sectors, and various non-governmental organizations. Regulatory quality index measures perceptions regarding the government's ability to develop and implement sound policies and regulations that encourage and permit private sector growth in the country. The index is a standardized value between -2.5 (weak) and 2.5 (strong)[212]. A summary based on the most recent data available for the countries is presented at Table 10.2.

Table 10.2. Summary of maritime profile indicators of the examined countries[213]

Country	**Regulatory quality index value** (-2.5 weak; 2.5 strong)							
	2013	2014	2015	2016	2017	2018	2019	2020
Bangladesh	-0.8	-1.0	-0.9	-0.9	-0.9	-0.8	-0.8	**-0.8***
Democratic Republic of the Congo	NA	-1.4	-1.4	**-1.3***	NA	NA	NA	NA
Indonesia	-0.3	-0.3	-0.2	-0.1	-0.2	-0.1	-0.1	**-0.1***
Nigeria	-0.7	-0.7	-0.7	-0.8	-0.8	-0.9	-0.9	**-0.9***
The Philippines	-0.3	-0.1	-0.1	0	0	0	0	**0***
Senegal	-0.2	-0.1	0	-0.2	-0.2	-0.1	-0.1	**-0.1***
Tanzania	-0.4	-0.4	-0.3	-0.3	-0.4	**-0.4***	NA	NA

* The values indicated in bold are taken as the most current and latest values provided for the relevant country and have formed the basis for the discussions in this study.

Alignment with IMO model regulations

The level of alignment between relevant national legislation and the IMO Model Regulations on Domestic Ferry Safety[214] was examined to gain a better understanding of the scope and coverage of that national legislation. This was accomplished by inviting a response to a specific question in the survey questionnaire and following-up with discussions in subsequent interviews.

https://www.cambridge.org/core/journals/hague-journal-on-the-rule-of-law/article/abs/worldwide-governance-indicators-methodology-and-analytical-issues1/D2DBA45F726D0442A29A651710D96C37

[212] Worldwide Governance Indicators. (2022). WGI Aggregation Methodology. https://info.worldbank.org/governance/wgi/Home/Documents

[213] The World Bank. (2022). TC Data 360. Regulatory quality. https://tcdata360.worldbank.org/indicators/51ada6ba?country=BGD&indicator=40283&countries=COD,IDN,NGA,PHL,SEN,TZA&viz=line_chart&years=2013,2020

[214] IMO. (2021). Draft Model Regulations on Domestic Ferry Safety. MSC Resolution MSC 104/18/Add.1. Annex 3. London: IMO.

The questionnaire survey and interviews revealed that while the IMO model regulations are yet to be widely implemented, there is no comprehensive and one-to-one alignment in any of the countries studied. Implementation appears to be the biggest challenge in this regard.

If alignment were to be considered as two-dimensional with enactment of legislation on one level and implementation on the other, then the Philippines, Bangladesh, and Indonesia are countries with the closest legislative alignment, respectively, followed by Nigeria. However, when the alignment level is evaluated in terms of implementation, there is deficiency in more than 80% of the existing fleet in all the countries examined due to various reasons such as diversity of the fleet, challenges in inspection and monitoring, limitation of qualified human resources, and financial constraints. Based on responses provided during the survey and interviews, an overview of the regulatory alignment in the countries examined with the IMO model regulations is shown in Figure 10.4.

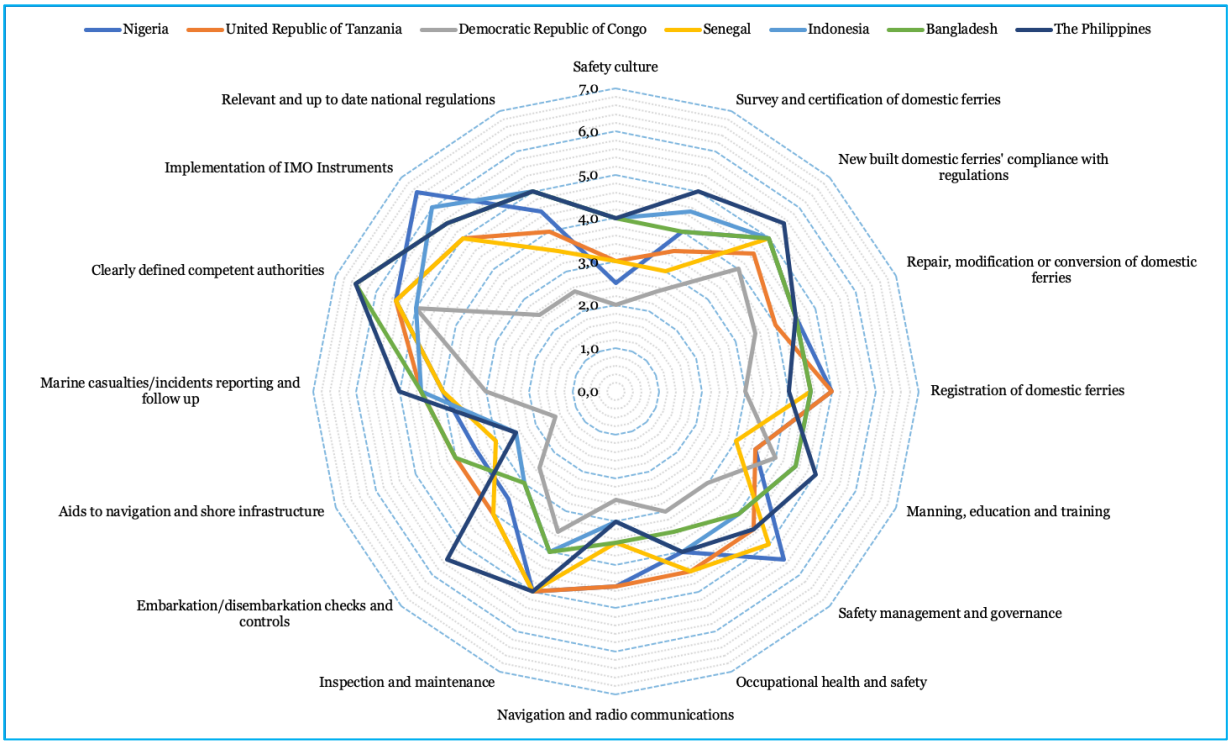

Figure 10.4. Alignment of national legislation with IMO model regulations in the countries examined

Feedback from interviews on individual countries

Bangladesh

For Bangladesh, issues mentioned related to in the inland water transport system included:

- the need for continuous dredging and route maintenance due to excessive sedimentation in rivers, making the fairway shallow and narrow;

- prevention of overloading is a challenge due to high demand;
- shortage of technical and experienced staff (e.g., dredging/hydrography);
- pollution prevention in the rivers caused by domestic shipping is a challenge; and
- local shipyards building domestic ferries need harmonization and standardization.

The Democratic Republic of the Congo

Several issues were raised regarding the sector's governance in the Democratic Republic of the Congo, including:

- absence of up-to-date text in the regulations governing the river and lake transport system;
- lack of a strategic policy for maritime transport including inland water transport;
- inconsistency between the central government and provincial authorities in the administration of the ferry sector;
- lack of an operationally effective stakeholder consultation body;
- competencies of ministries and services intervening in the field of inland water transport, in particular on overlapping issues;
- low wages, lack of bonuses or incentives, low morale and inadequate working conditions for all personnel involved in river and lake transport; and
- lack of statistical data for inland water transport.

Indonesia

Issues were discussed regarding domestic ferry transport in Indonesia, including:

- deficiencies in regulation and government responsibilities;
- two different entities for the management of domestic ferry transport namely, the Directorate-General Land Transport and Directorate-General Sea Transport with a complex relationship between them and their responsibilities;
- need for regulating maritime transport involving a large number of stakeholders including private industry interests;
- very dynamic demand for ferry services involving seasonal peaks, fulfilled by a wide range of ships engaged in ferry services, including a large number of traditional, often wooden-built boats;
- lack of adequate controls in terms of record-keeping of arrivals and departures and checks of passengers and cargo embarked, due to time pressure during port calls;
- lack of fit for purpose regulations for domestic ships; and

- lack of competency requirements for the crew of traditional boats.

Nigeria

A number of safety challenges and gaps in the inland water transport system in Nigeria were revealed, including:

- lack of training of the personnel and the operators;
- inconsistencies between policies and their scope and the need for the right policy with the right scope;
- limited stakeholder consultation during policy making;
- challenges in policy enforcement, since operators are familiar with the policies;
- discrepancies in the ship registration system, with no clarity on the exact number of the flagged fleet, and operators unwilling to register vessels to avoid taxation;
- poor state of infrastructure, in particular, berths and terminals;
- overlap and issues between local government and state government, in particular, related to registration and tax collection; and
- risk perception of society being weak and low with passengers unwilling to wear life jackets.

The Philippines

Related to domestic passenger shipping in the Philippines, the needs highlighted included:

- building standards for small boats of traditional build needed to be regulated further in a harmonized and fit for purpose manner;
- building the technical capacity of human resources in the enforcement agencies;
- building the technical capacity of accident and incident investigation personnel;
- improvement of shore and port infrastructure, particularly in remoter islands; and
- greater information sharing between all relevant stakeholders, possibly facilitated by a digital platform.

Senegal

For Senegal, issues relating to in the inland water transport system were raised:

- the joint management of the Senegal River is complicated by divergent interests, differing objectives, and the perceived loss of national sovereignty;
- insufficient human resources, and technical capacity in the enforcement agencies; and

- lack of fleet monitoring mechanisms, the direct participation of all users, and the negative effects of large developments in the Senegal river basin hinder the effective and efficient management of the Senegal River by the administration.

Tanzania

A number of safety challenges in domestic ferry transportation in the United Republic of Tanzania were revealed, including:

- non-existence of a strict certification regime for small craft, leading to their poor condition;
- room for comprehensive review and updating of domestic shipping regulations (currently in process);
- lack of financial resources to maintain the laws and update regulations;
- insufficient number of technical personnel (the authorities are aware but unable to secure finance);
- government is investing heavily in developing infrastructure since it is visible to the public, however, improvement in human resources is neither keeping pace nor is it visible;
- lacking proper enforcement due to insufficient human resources; and
- operators lack of safety awareness.

10.3 National Political Landscape Index

Each country examined in this study has a different and complex national political landscape, as presented in Sections 3-9. This complexity and diversity pose a challenge in assessing the political landscape. Therefore, to offer a standard overview, five global indices have been used namely, government effectiveness index, corruption perception index, political stability index, Ibrahim Index of African Governance, and the country's credit rating.

Government effectiveness index

The government effectiveness index[215] captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, as well as the quality of policy formulation and implementation and the credibility of the government's

[215] Worldwide Governance Indicators. (2022). Government Effectiveness. https://info.worldbank.org/governance/wgi/Home/downLoadFile?fileName=ge.pdf

commitment to such policies. The government effectiveness index is a standardized value between -2.5 (weak) and 2.5 (strong).

The government effectiveness index of the countries under study for 2020 are as follows: Bangladesh (-0.79); the Democratic Republic of Congo (-1.69); Indonesia (-0.37); the Philippines (0.06); Nigeria (-1.03); Senegal (-0.01); and the United Republic of Tanzania (-0.77).

Corruption perception index

The corruption perception index (CPI)[216] ranks the countries around the world based on their perceived levels of public sector corruption. Annual reports have been published by Transparency International, a United Kingdom-based independent anti-corruption organization, since 1995. The corruption perception index is a standardized value varying between 0 (highly corrupt) and 100 (very clean). According to the 2020 report, as part of the global picture, over two-thirds of countries score less than 50, and nearly half have been stagnant on the CPI for almost a decade despite some progress[217].

It would be important to consider the CPI value when identifying a country's potential to successfully implement any safety intervention.

Political stability index

Political stability is a critical consideration when it comes to the effective implementation and enforcement of safety instruments or applying a technical assistance program from overseas in a country keen to improve safety. Absent political stability, it might be challenging for any structured safety intervention to be successful and effective in the domestic ferry sector given its long-term nature. In this study, the political stability and absence of violence index are used to present an overview of this matter.

The political stability index is one of the WGI indexes that captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. Like the other WGI indices, political

[216] Transparency International. (2022). Corruption Perceptions Index 2021 Media Kit. https://www.transparency.org/en/cpi/2021/media-kit

[217] Transparency International. (2020). Corruption Perceptions Index 2020. The results at a glance. https://www.transparency.org/en/cpi/2020.

stability index is a standardized value varying between -2.5 (weak) and 2.5 (strong)[218]. WGI calculates the country indexes according to inputs from a minimum of 8 different data sources[219].

According to 2020 data, the political stability and absence of violence index of the countries in this study is as follows: Bangladesh (-0.92); the Democratic Republic of Congo (-1.71); Indonesia (-0.5), Nigeria (-1.86); the Philippines (-0.79); Senegal (-0.02); and Tanzania (-0.41).

Ibrahim index of African governance

The Ibrahim Index of African Governance (IIAG) has been assessing the quality of governance in African countries annually since 2007. The IIAG is one of the most comprehensive collections of African governance data, combining over 70 variables from more than 30 independent African and global institutions[220]. The overall ranking system of IIAG comprises four primary categories: Security and Rule of Law, Participation, Rights and Inclusion, Foundations for Economic Opportunity and Human Development. Also, there are 16 subcategories and 79 indicators within these categories. Every year, the IIAG is refined, either methodologically or as a result of a change in indicators that are included or excluded. As a result, the entire data set is updated for the whole time series when new historical data are available, or the IIAG is strengthened. The IIAG index is a standardized value varying between 0 (lowest score) and 100 (the best possible score)[221]. The index is only available for the African countries. Among the categories and subcategories of the IIAG, the aggregated 'Overall Governance' index is considered a good proxy representation of the general overview. According to the most recently available 2019 data, the IIAG of the four African Countries in the scope of this study is as follows: the Democratic Republic of Congo (31.7); Nigeria (45.5); Senegal (63.2); and the United Republic of Tanzania (53.0).

[218] Worldwide Governance Indicators. (2022). Political Stability and Absence of Violence/Terrorism. https://info.worldbank.org/governance/wgi/Home/downLoadFile?fileName=pv.pdf

[219] Worldwide Governance Indicators. (2022). Political Stability and Absence of Violence/Terrorism. Interactive Data Access. https://info.worldbank.org/governance/wgi/Home/Reports

[220] Raw data come in different scales from source. In order to be compared and combined, data are transformed to a standardized range of 0.0-100.0. Once all indicators have been transformed to a common scale, a simple method of aggregation is applied to calculate the scores. The overall score is the average of the underlying category scores; the category scores the average of their underlying sub-categories, and the sub-categories the average of their constituent indicators. Source: Mo Ibrahim Foundation. (2022). Ibrahim Index of African Governance (IIAG). https://mo.ibrahim.foundation/iiag

[221] Mo Ibrahim Foundation. (2022). Ibrahim Index of African Governance (IIAG). https://mo.ibrahim.foundation/iiag

Country credit rating index

Country credit rating (sovereign credit rating) is an evaluation of an individual country to predict its ability to repay a debt or fulfil its financial commitments. It is an independent assessment of the creditworthiness of a country or a sovereign entity. Investors use sovereign credit ratings to assess the riskiness of a particular country when it comes to investing in that country. There are various agencies namely, Standard & Poor's, Moody's, Investors Service, Fitch etc., and all of them have their own evaluation methods and data sources to assign ratings. These ratings are, in principle, based on an analysis of the country's borrowing, lending, and operating performance over time. Not all agencies cover worldwide credit ratings, so Moody's Analytics 2021 was preferred because it continuously rates and shares the ratings of all seven countries examined for this study. Moody's Investors service and analytics is one of the global credit rating agencies (with 40% share in the world credit rating market[222]) which performs international financial research and analysis on commercial and government entities[223]. The Moody's rating system follows a 7-point alphanumeric scale[224] ranging from *Aaa* for the smallest degree of risk through *Aa*, *A*, *Baa*, *Ba*, and *B* to *Caa* indicating a very high credit risk.

The 2021 credit ratings of the countries are as follows: Bangladesh (questionable credit quality); the Democratic Republic of Congo (very high credit risk); Indonesia (moderate credit risk); Nigeria (high credit risk); the Philippines (moderate credit risk); Senegal (questionable credit quality); and United Republic of Tanzania (high credit risk).

An overview of the national political landscape indices of the examined countries is presented in Table 10.3.

[222] Hung, M., Kraft, P., Wang, S., & Yu, G. (2022). Market power and credit rating standards: Global evidence. *Journal of Accounting and Economics, 73(2-3)*, 101474.

[223] Moody's. (2022). Who we are? https://www.moodys.com/

[224] Trade Economics. (2022). Credit Ratings. https://tradingeconomics.com/country-list/rating

Table 10.3. Summary of national political landscape indicators of the countries examined

Country	National political landscape index				
	Government Effectiveness[a] (2020)	Political Stability[a] (2020)	Corruption Perception[b] (2020)	Ibrahim Index of African Governance[c] (2019)	Country Credit Rating[d] (2021)
Bangladesh	-0.79	-0.92	26	NA	Ba3
Democratic Republic of Congo	-1.69	-1.71	18	31.7	Caa1
Indonesia	-0.37	-0.5	37	NA	Baa2
Nigeria	-1.03	-1.86	25	45.5	B2
Senegal	-0.01	-0.02	45	63.2	Ba3
The Philippines	0.06	-0.79	34	NA	Baa2
United Republic of Tanzania	-0.77	-0.41	38	53.0	B2

a: Scale is varying between -2.5 (weak) and 2.5 (strong); b: Scale is varying between 0 (highly corrupt) and 100 (very clean); c: Scale is varying between 0 (lowest) and 100 (best possible score); d: Scale is alphanumeric including; Aaa: Smallest degree of risk//Aa (Aa1, Aa2, Aa3): Very low credit risk//A (A1, A2, A3): Low credit risk//Baa1, Baa2, Baa3: Moderate credit risk//Ba1, Ba2, Ba3: Questionable credit quality//B1, B2, B3: High credit risk//Caa1, Caa2, Caa3: Very high credit risk.

10.4 Public Attitude Towards Safety Index

Willingness to pay for safety

Even though everyone deserves and needs safety, in most cases, it comes with a cost. Therefore, achieving safety is often closely related to one's purchasing power or affordability. Countries can develop and import technology at the highest level and legislate the most robust and strict regulations. However, the population's ability to have those in practice is a matter of willingness to pay. A society's willingness to pay for safety is highly complex and variable at both, personal and country level. Since it is a challenge to measure and quantify objectively, an overview of the publics' willingness to pay for safety is gained by examining the GDP and GDP per capita of the countries of interest.

The GDP of the countries for 2021[225] is as follows: Bangladesh (416 billion USD); Democratic Republic of Congo (54 billion USD); Indonesia (1.2 trillion USD); Nigeria (441 billion USD); Philippines (394 billion USD); Senegal (28 billion USD) and United Republic of Tanzania (68 billion USD).

[225] The World Bank. (2021). GDP (current US$) - Tanzania, Bangladesh, Congo, Dem. Rep., Nigeria, Philippines, Indonesia, Senegal. https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=TZ-BD-CD-NG-PH-ID-SN

Further, the GDP per capita of the countries for 2021[226] is as follows: Bangladesh (2,503 USD); Democratic Republic of Congo (584 USD); Indonesia (4,292 USD); Nigeria (2,085 USD); Philippines (3,549 USD); Senegal (1,607 USD); and United Republic of Tanzania (1,136 USD).

An overview of publics' willingness to pay for safety was additionally sought through a statement in the online survey instrument, '*Passengers in the domestic ferry sector would be willing to pay more for safer vessels*' that elicited a response on a 5-point Likert scale; strongly disagree, disagree, neutral, agree, and strongly agree. In total, 85 participants responded to the online survey voluntarily; Nigeria (13), the United Republic of Tanzania (12), the Democratic Republic of Congo (12), Senegal (12), Indonesia (12), Bangladesh (12), and the Philippines (12). According to the responses provided, participants from the Philippines (59%), Indonesia (57%), Nigeria (55%), Bangladesh (52%), the United Republic of Tanzania (48%), Senegal (40%), and the Democratic Republic of Congo (40%) strongly agreed/agreed that based on their experience and interpretations passengers are willing to pay more for safer vessels.

Public's level of safety awareness

Insights into the public's level of safety awareness were also obtained through a specific statement in the survey questionnaire that investigated whether the public has substantial influence to trigger the government's willingness and quick response to usher changes that could improve the safety of domestic ferries. Participant response was solicited on a 5-point Likert scale; strongly disagree, disagree, neutral, agree, and strongly agree.

According to the responses provided, participants from the Philippines (60%), Indonesia (60%), Bangladesh (58%), Nigeria (50%), United Republic of Tanzania (46%), Senegal (40%), and the Democratic Republic of Congo (38%) strongly agreed or agreed that, based on their experience and interpretations, the public has substantial influence to trigger policy changes by the government.

[226] The World Bank. (2021). GDP per capita (current US$) - Bangladesh, Indonesia, Senegal, Congo, Dem. Rep., Nigeria, Philippines, Tanzania. https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=2021&locations=BD-ID-SN-CD-NG-PH-TZ&most_recent_value_desc=true&start=2018

Public's perceptions and experiences of safety and risk

Just as political will is an essential requirement for any country identified for a safety intervention, so is the public's perspective and perception of safety and risk. A sound understanding of society's safety perception or rather, level of need would provide an opportunity to estimate the likelihood of adoption of the steps taken by the regulators[227].

The Lloyd's Register Foundation (LRF) conducted the first World Risk Poll (WRP)[228] study in 2019. This study was primarily aimed at addressing the knowledge gap in the public perceptions and experiences of safety and risk on a global scale. Following up on previous research, in 2021, LRF conducted another WRP study[229] involving 125,911 participants from 121 countries and territories. The poll carried a specific Likert scale question, '*Overall, compared to five years ago, do you feel safer, less safe, or about as safe as you did five years ago?*' which is closely related to the public perception of safety.

The study makes use of the responses to this question in WRP 2021 to provide an overview of the public's perception of safety in the seven examined countries. In LRF WRP report 2021, the questionnaire responses are presented by regions, namely; South-eastern Asia, Central/Western Africa, Northern America, Eastern Europe, Southern Africa, Southern Asia, Eastern Africa, Middle East, Central Asia, Southern Europe, Latin America & Caribbean, Northern/Western Europe, Australia and New Zealand, Northern Africa, and Eastern Asia.

According to the WRP 2021 responses, Nigeria (51%), the Democratic Republic of Congo (51%) and Senegal (51%) are the countries with the highest number of respondents who stated that they feel less safe. On the other hand, the Philippines (26%) and Indonesia (26%) are the countries with the least number of participants who responded feeling less safe. Table 10.4 summarises the public attitude towards safety in the selected countries.

[227] Marshall, T. M. (2020). Risk perception and safety culture: Tools for improving the implementation of disaster risk reduction strategies. *International journal of disaster risk reduction*, *47*, 101557.

[228] Lloyd's Register Foundation, and Gallup. (2019). The Lloyd's Register Foundation World Risk Poll. https://wrp.lrfoundation.org.uk/2019-world-risk-poll/data-resources/

[229] Lloyd's Register Foundation, and Gallup. (2021). World Risk Poll 2021: A Changed World? Perceptions and Experiences of Risk in the Covid Age. https://wrp.lrfoundation.org.uk/LRF_2021_report_risk-in-the-covid-age_online_version.pdf

Table 10.4. Summary of the public attitude towards safety in the countries examined (%)

Country	Public attitude towards safety index (%)												
	Publics' willingness to pay for safety [a]					Publics' level of safety awareness [a]					Publics' perception of risk [b, c]		
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	More-safe	About-safe	Less-safe
Bangladesh	0	10	38	30	22	0	10	32	38	20	36	29	33
DRC	0	40	20	28	12	8	30	24	38	0	28	19	51
Indonesia	0	16	27	30	27	0	7	33	46	14	27	45	26
Nigeria	8	8	29	40	15	8	16	24	35	15	28	19	51
The Philippines	0	16	25	40	19	0	5	35	38	22	27	45	26
Senegal	0	10	50	30	10	8	20	32	35	5	28	19	51
Tanzania	0	32	20	20	28	8	16	30	34	12	29	20	48

a: Likert scale of 5 has been used varying between strongly disagree and strongly agree; b: Likert scale of 3 has been used varying between more safe and less safe; c: Source: World Risk Poll (LRF, 2021).

10.5 Previous external ferry safety interventions

Knowledge of previous ferry safety projects and their scope is essential to understand how often and to what extent the industry has engaged in domestic ferry safety projects, what has been studied and to what extent are existing safety issues likely to be addressed. An awareness of the ongoing ferry safety projects in the examined countries, for example, would be a crucial determinant for the possible exclusion of the current beneficiary countries from immediate consideration for further projects.

As regards previous projects, except for Nigeria, which has received no known relevant technical assistance, all the examined countries had received one or more previous safety interventions. Significantly, Bangladesh, Indonesia and the Philippines had ongoing interventions in collaboration with international technical cooperation and funding bodies (Table 10.5).

Table 10.5. Main previous external ferry safety interventions received by the examined countries

Country	Project	Year	Funding Agency
Bangladesh	Pilot project on ferries operating in the coastal and domestic waters of Bangladesh	2005	IMO & InterFerry
	The Bangladesh Regional Waterway Transport Project 1 (BRWTP1)	2016-2025	World Bank Group
Democratic Republic of Congo	The Multimodal Transport Project (PTM)	2004-2015	World Bank Group
	The Support Programme for the Navigability of Rivers and Lakes Waterways	2010	European Development Fund
Indonesia	Study on the Development of Domestic Sea Transportation and Maritime Industry in the Republic of Indonesia (STRAMINDO)	2004	Japan International Cooperation Agency
	Hazard Identification (HAZID)/Scoping Exercise to identify safety issues pertaining to passenger ships on non-international voyages in Indonesia	2018	IMO
	Ongoing study	2022	Australian Maritime Safety Agency
Nigeria	No known external technical assistance project for safety of domestic ferries		
The Philippines	FerrySafe Project	2019-2020	Lloyd's Register Foundation
	Enhancing safety and energy efficiency of domestic passenger ships in the Philippines	2021-2022	World Bank Group-International Finance Corporation-IMO Integrated Technical Cooperation Programme
Senegal	Senegal river basin multipurpose water resources development project 2	2013-2017	World Bank Group
United Republic of Tanzania	The Transport Sector Support Project (TSSP)	2010	World Bank Group
	Second central transport corridor project	2017	World Bank Group
	Lake Victoria Transport Program - Phase 3 Tanzania	2018	World Bank Group

10.6 Composite evaluation matrix

A composite evaluation matrix of attributes for the seven high-risk countries for domestic ferries is presented in a visual format in Table 10.6. The visualization is based on a gradient colour scale, with the darker shades indicating higher values, and the lighter shade indicating a lower value of the index for the studied countries.

Table 10.6. Composite evaluation matrix in gradient colour scale for the seven high-risk countries for domestic ferries

Measure (Attribute/Indicator/Index)		Countries (ISO 3166 ALPHA-2)						
Tier 1	Tier 2	NG	TZ	CD	SN	ID	BD	PH
1. Domestic ferry industry demographics (DFID)	1.1. Size of the domestic ferry fleet	4	5	3	7	6	1	2
	1.2. Population depending on ferry transport	2	6	5	7	1	3	4
	1.3. Size of navigable waters	5	4	3	7	1	6	2
2.Unsafe occurrences and regulations (UOR)	2.1. Incidence of accidents	3	6	4	7	1	2	5
	2.2. Trend in the last 10 years	1	5	2	7	3	6	4
	2.3. Severity of consequences	4	1	2	7	5	3	6
	2.4. Regulatory quality index	5	3	6	2	2	4	1
	2.5. Alignment with IMO Model regulations	2	3	4	4	1	1	1
3. Political gauge (POGA)	3.1. Government effectiveness index	6	4	7	2	3	5	1
	3.2. Corruption perception index	6	2	7	1	3	5	4
	3.3. Political stability index	7	2	6	1	3	5	4
	3.4. Ibrahim Index of African Governance (Overall)	3	2	4	1	*	*	*
	3.5. Country's credibility rating (Moody's)	3	3	4	2	1	2	1
4. Public attitude towards safety (PATS)	4.1. Passengers' willingness to pay for safety	2	3	4	4	1	2	1
	4.2. Passengers' level of safety awareness	2	2	3	3	1	1	1
	4.3. Public perception and experience of safety and risk	4	3	4	4	1	2	1
5. Previous external ferry safety interventions (PEFSI)		1	4	3	2	7	6	5

Scale	Lowest (7)	(6)	(5)	(4)	(3)	(2)	Highest (1)

* This index is not applicable for the indicated countries.

11 CONCLUSION

This study conducted a scoping exercise on the safety of domestic ferry industries in seven countries: Bangladesh, the Democratic Republic of Congo, Indonesia, Nigeria, Philippines, Senegal, and Tanzania, in which domestic ferry accidents occur frequently and result in devastating consequences. The scoping exercise primarily aimed to identify the most suitable country/ies where further safety intervention could be conducted with a high likelihood of success and significant impact on safety improvement.

The route taken by the study to reach the aim was as follows:

- preparation of domestic ferry accident data for the seven examined countries for the period of 2001-2021;
- collection of regulatory data through desktop research, questionnaire survey and stakeholder interviews;
- identification of trends and hazards threatening the safety of domestic ferries by WMU through analysing the accident data, questionnaire responses and interview notes;
- examination of alignment of national domestic ferry safety regulations with IMO model regulations have been examined through regulatory analysis;
- examination of broad national political landscape, state's willingness to facilitate and receive safety intervention, and public attitude towards safety using globally recognized indexes, questionnaire responses and interview notes; and
- composite evaluation of the aforesaid attributes in respect of the seven high-risk countries for domestic ferries.

The structured, multi-criteria evaluation matrix for the study included five main areas as follows:

- Domestic ferry industry demographics (DFID) covering items related to the country profile, and maritime profile of the country aimed to present a good overview of the country's demographics, the total audience targeted, and the magnitude of the impact if the potential safety intervention is successful;
- Unsafe occurrences and regulations (UOR) including the incidence of ferry accidents, the severity of ferry accidents, the trend of accident numbers, regulatory quality index of the country, and alignment with IMO Model regulations aimed to understand how the safety

parameters are evolving in the country and which country needs a safety intervention more urgently;

- Political gauge (POGA) encompassing political stability index, corruption perception index, government effectiveness index, Ibrahim Index of African Governance, and the country's credit rating aimed to identify which country is relatively more open to an external safety intervention and in which country it will be easier and more effective to initiate and implement a safety intervention;
- Public Attitude Towards Ferry Safety (PATS) explored through publics' willingness to pay for safety, publics' level of safety awareness, and public perceptions and experiences of safety and risk attributes; and
- Previous external ferry safety intervention (PEFSI) aimed to examine whether there are ongoing projects or the country received any external safety intervention in the domestic ferry sectors from inter-governmental or international non-governmental organizations.

All of the countries studied were found to have unique, distinct, and individual characteristics which clearly distinguished them from each other.

Indonesia, the Philippines and Bangladesh are distinguished by their large fleet sizes, extensive navigable routes, high population, existent political willingness, and relatively more positive public attitude towards safety. Given their openness to initiatives, these countries either have notable ongoing domestic initiatives and efforts or are already the recipient of numerous current and/or recent past technical assistance programs by external agencies.

The Democratic Republic of the Congo and Senegal are marked by a high reliance on riverine transport over the Congo River, and Senegal River respectively. Besides, alternative modes of public transport are either less developed or do not reach remote areas of these countries. Senegal, however, has a relatively smaller size, of its fleet, navigable waters and user population.

Tanzania has a uniquely diversified government structure with its attendant complexities. Whereas users of domestic ferries in Nigeria are primarily local citizens who commute by ferries on a daily basis, over 90 percent of the ferry transport in Tanzania serves tourism.

Furthermore, each examined country was identified as having its own share of strengths, weaknesses, opportunities and threats to safety in the domestic ferry sector. The SWOT analysis

and composite safety evaluation matrix for each of the seven high-risk countries for domestic ferries are presented at Appendix.

Whereas a needs assessment study would be necessary for a detailed roadmap to be developed in any country before planning any safety intervention, in light of the study results, there is reason to believe that there are certain basic, common needs integral to the improvement of domestic ferry safety regardless of the country of choice.

As the first step, primary actions should be taken in every country to align the domestic ferry safety system with the IMO Model Regulations on domestic ferry safety and, thereafter, secondary actions should be taken to sustain the safety system with continuous improvement.

Primary actions to establish the domestic ferry safety system would include the following:

- clearly defined competent authorities and their responsibilities;
- clearly defined vessel classification (vessel types);
- mandatory registration of all vessels regardless of size (preferably digital register);
- defined manning, education and training standards for each vessel type;
- clearly defined embarkation controls, and passenger ticketing;
- aids to navigation and shore infrastructure; and
- occupational health and safety standards.

Secondary actions to sustain the safety system with continuous improvement would include the following:

- survey and certification of domestic ferries, including new building, imported, repair, modification or conversion;
- regular safety checks, inspections and monitoring;
- collating passenger transport statistics;
- mechanism for mandatory reporting of marine casualties and incidents;
- diligent safety investigation and follow-up; and
- providing structured safety management training to ferry owners and operators.

Figure 11.1 presents an overview of the recommended primary actions to establish the domestic ferry safety system, and secondary actions to sustain the safety system with continuous improvement.

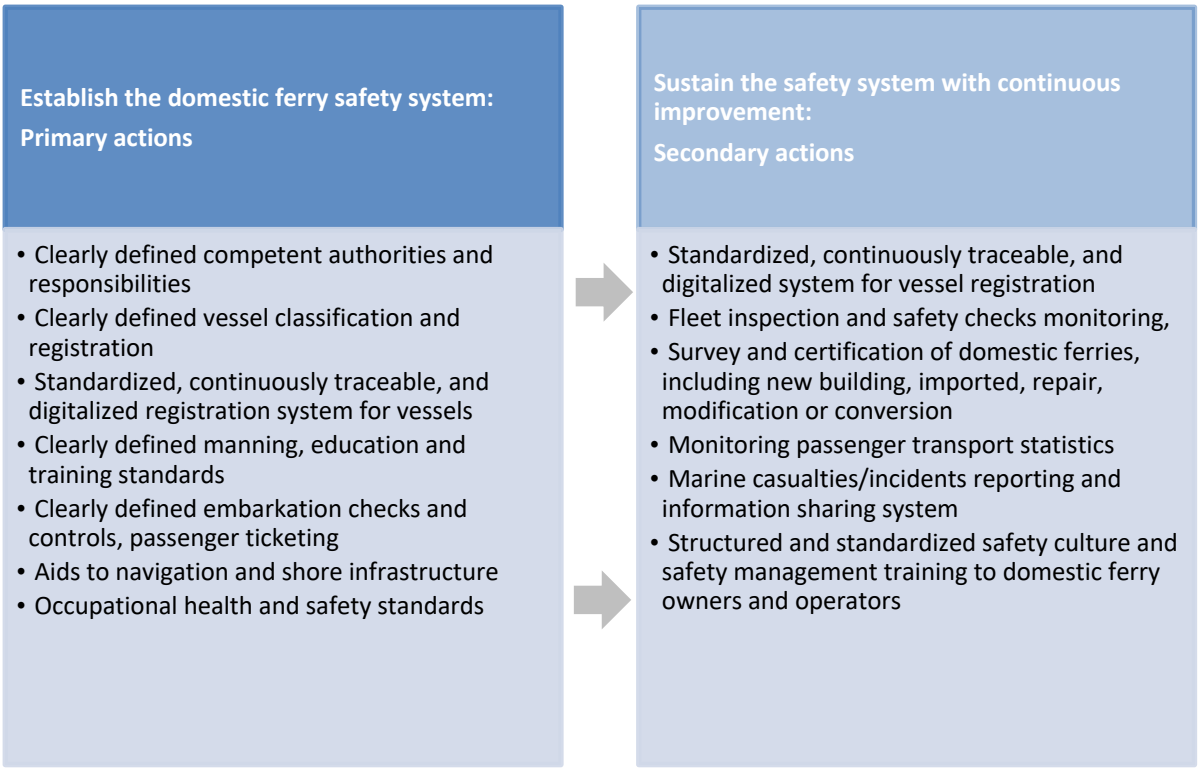

Figure 11.1. Recommendations to establish and sustain a domestic ferry safety system

ANNEX: SWOT ANALYSIS

A1. SWOT ANALYSIS: BANGLADESH

Strengths
• Largest fleet, in terms of numbers, among the examined countries • Well-structured inland water transport administration • Relatively more efficient inland ship registration system among the examined countries • Riverine country with more developed embarkation and disembarkation facilities compared to archipelagic countries and other riverine countries in the study • High population, placing high demand for services on the domestic passenger vessel transport
Weaknesses
• Heavy siltation during monsoons significantly reducing the size of navigable waters (in need of continuous maintenance and high investment) • Due to high demand, prevention of overloading is a challenge • Multiple safety interventions/investments already received by the domestic shipping industry • Since there is an excessive number of vessels and a limited number of enforcement personnel, fulfilment of enforcement inspections is a challenge
Opportunities
• The government is currently focused on prioritizing river routes to reduce the load on land transport and likely to welcome any safety intervention in this regard • Water transportation connects areas inaccessible by road and rail; the necessity of a safety intervention in domestic passenger shipping is higher due to the non-existence of alternative modes of transport
Threats
• Although the government is willing to support any safety intervention, the complicated political structure can be a challenge during the initiation process and so also to bring all the stakeholders onboard • The fact that the country is prone to tropical cyclones and heavy rains, any river route expansion initiative may need continuous planning and investment, which may increase the financial budget of any safety intervention

A2. SWOT ANALYSIS: DEMOCRATIC REPUBLIC OF THE CONGO

Strengths
• 17,000 km of waterways • Population of more than 90 million distributed between large cities such as Kinshasa, Lubumbashi, Kisangani, Matadi, etc. • Significant assets in shipyards • Extensive areas reserved for berths and ports • Large and young workforce
Weaknesses
• Absence of up to date and integrated maritime regulations • Lacking in strategic transport development policy • Lower political stability in the country • Lack of connectivity of ports with the hinterland • Insecurity is still noticeable in several regions of the country • Insufficient knowledge of the supply/demand of inland waterway and lack of system for monitoring data statistics • The State gives more priority for its infrastructure investments in the road network and rail transport • Lack of training centres for inland water transport
Opportunities
• Location in the heart of Africa with nine border countries makes it favourable to create bigger impact through a successful safety intervention • Existence of regional integration between the Congo River countries provides opportunity to extend the impact of the intervention • Existence of the Regional Training Center in Inland Navigation (CRFNI) created and managed by CICOS provides opportunity to build and exchange human resource capacity • Existence of a World Bank study in 2012 providing guidance on how to improve the performance of the river, sea and lake transport sub-sector
Threats
• Vastness of the national territory requires larger financial resources in the development of infrastructure • Insecurity in several regions hinders the attraction of investors and partners • The absence of deep-water ports in many regions does not allow large boats to dock there, which does not attract potential investors in the sector • Fragmented regulatory framework makes enforcement a challenge • Risk of failure of a safety intervention due to political climate

A3. SWOT ANALYSIS: INDONESIA

Strengths
• A population of more than 270 million • Southeast Asia's largest economy and an emerging market • Strategic location between Asia and Australia and the Pacific and the Indian Ocean • Approximately 95,000 km of coastline and more than 17,000 islands • Shipbuilding capacity • Domestic ferry regulations available
Weaknesses
• The economic landscape still includes poverty, unemployment, inadequate infrastructure, corruption, a complex regulatory environment, and unequal resource distribution among its regions • Domestic shipping regulations are inconsistently implemented and enforced • Domestic transport efficiency is prioritized at the expense of safety • High reliance on traditional boats • Lack of official records of traditional boats
Opportunities
• Ferry services are a high government priority and part of national plans, which may facilitate safety interventions • With more than 17,000 islands, ferry transportation is crucial for connecting many people; a successful safety intervention will have a significant impact
Threats
• Domestic ferry transport involves a number of stakeholders, including private industry actors, required to be regulated by the government • Overlaps between authorities regulating the sector may result in gaps during enforcement processes • Major reliance on traditional shipping; governing the safety standards on traditional ships may be a challenging task • The demand for ferry services is very dynamic and involves seasonal peaks; this may require a particularly dynamic safety system

A4. SWOT ANALYSIS: NIGERIA

Strengths
• 10,000 km of navigable inland waterways and 850 km of coastline • Key and potential economic player in Africa • More than 217 million population • Significantly lower number of previous safety interventions • Structured inland water transport authorities • River transport connects 28 of the 36 states and 5 neighbouring countries • High reliance of population on inland water transport • Existence of qualified personnel in inland water sector
Weaknesses
• Insufficiently favourable political landscape in the country • Lack of statistical data about domestic vessel fleet size • Overlap and issues between local government and state government related to ship registration and tax collection • Security concerns in several inland water transport jetties
Opportunities
• A large population and high number of inland water transport users is more likely to result in bigger impact of a successful safety intervention • Structured inland water transport authorities facilitate initiation and bringing forward successful safety intervention through close collaboration with all stakeholders • Possible connection via inland water transport for many regions makes this sector an opportunity for the development of other sectors (agriculture, mining, cargo movements etc.) • Willingness of current government to support maritime sector • Existent regulatory framework governing inland water transport supports development of the sector
Threats
• Lack of accurate statistical data about inland shipping presents challenges for the estimation of the financial resources needed for a safety intervention

A5. SWOT ANALYSIS: THE PHILIPPINES

Strengths
• Strong engagement and continuous interaction between government stakeholders and private stakeholders of domestic passenger transport • Significant port infrastructure improvements and fleet modernization initiatives were taken in the last ten years (both international and national) • More stable political structure
Weaknesses
• Diversified fleet structure and ownership structure (associations) • Archipelago (high number of islands/remote islands) makes sea transportation a mandate, impossible to connect with land transport; providing less flexibility • There are already multiple, ongoing safety interventions • Access to capital (finance) for private individuals is challenging
Opportunities
• Close connection and already established interaction between stakeholders could facilitate easy initiation of any safety intervention • Government and public stakeholders of domestic passenger transport are willing to support any safety intervention • The impact of any successful safety intervention can create not only national but also global impact
Threats
• New, intended safety interventions may overlap with ongoing interventions, thereby adversely affecting the efficient use of resources, and intended outcomes • Diversified fleet ownership can create complications if the safety intervention requires private stakeholder engagement • The fact that the country is in a typhoon-prone area may require excessive investments in port infrastructure and maintenance

A6. SWOT ANALYSIS: SENEGAL

Strengths
• The economy is among the most stable and prosperous in sub-Saharan Africa, growing over 6% annually • Social and political stability • Gorée Island is a world popular tourist destination accessible by ferry from Dakar • The government took significant action in response to the *Le Joola* tragedy; Senegal's ferries are now managed and inspected with great care.
Weaknesses
• Poverty and food insecurity are common in Senegal's north, east, and south. • The country's maritime profile shows that the maritime sector is given low priority • Less population reliance on ferry transport • Lack of national training centres • Lack of regulatory framework specific to inland water transport. • The last amendment of the Code of Merchant Marine, a national maritime regulation, dates to 2002 and, therefore, lacks international obligations introduced after 2002
Opportunities
• Short coastline and navigable inland waterways (530 km Atlantic Ocean, 1,000 km rivers) make it easier to provide a successful safety intervention with less funding and in less time • Existence of a regional authority, OMVS, including four countries, to jointly manage the Senegal River • A favourable environment for investment due to social, economic and political stability
Threats
• Illegal immigration between Senegal and the Canary Islands must be considered when developing Senegal's ferry sector • Technical supervision is carried out by the Ministry of Fisheries and Maritime Affairs, while financial supervision is maintained by the Ministry of Economy and Finance, which may cause bureaucracy and require more coordination • Several entities regulate inland water transport, which may also cause bureaucracy and require more coordination

A7. SWOT ANALYSIS: TANZANIA

Strengths
• 14,000 km of navigable inland waterways and 1425 km of coastline • The inland ports are currently undergoing significant modernization to improve capacity to handle more passenger and cargo • Long history in transport of trains, cargo and passengers by ferry; the first ferry on Lake Victoria started operation in 1900 during the British colonial era • Diversity in the ship registration; Tanzania mainland has a closed ship registry, while Tanzania Zanzibar is an open registry • Favourable political landscape
Weaknesses
• Lacking in number of personnel with required technical capacity • The industry involves several stakeholders including ten ministries and several sectors covering operations, management, infrastructure, and policy formulation • Most inland water ports are operating beyond economic life (built around 1930s)
Opportunities
• Lake Victoria, Lake Tanganyika and Lake Nyasa link Tanzania with its neighbouring countries making the country an international gateway for landlocked neighbours • Over 99% of the ferry passengers in Zanzibar are foreign tourists from around the world who visit the country to experience the amazing islands; therefore, successful safety intervention will benefit the tourism sector in Tanzania • The diversity in ship registration gives opportunity to equally attract external and internal investments in ship owning • Favourable political landscape attracts external investors • Availability of structured cooperation mechanism between maritime administrations of Tanzania Mainland and Zanzibar
Threats
• Inadequacy of technical personnel • Involvement of numerous stakeholders in the maritime sector may result in complications while initiating any safety intervention; any entity decision has the potential to affect the performance of others • Existence of two different maritime regulatory entities, and regulatory ecosystems • Existence of old port infrastructure requiring high financial investments

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