



# Appropriate Technologies and Regulations for Domestic Ferry Safety in Developing countries

**King's Cross**  
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## Two types of passenger ships

There are two types of passenger ships.  
International ferry and domestic ferry

### International ferry



- International route
- Ruled by IMO

### Domestic ferry



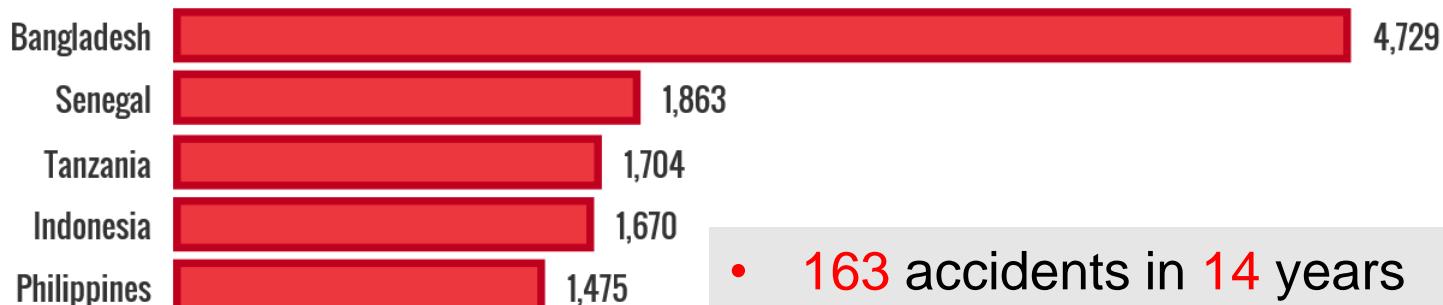
- domestic route
- Ruled by each country

## Top deadliest countries for ferry accidents

Bangladesh is the worst country among top five deadliest countries for ferry accidents.

### Top Five Deadliest Countries for Ferry Accidents (2000-2014)

Total includes the minimum estimate of fatalities and missing people.



Source: [Worldwide Ferry Safety Association](#)

[Get the data](#) [Fullscreen](#)

- 163 accidents in 14 years
- Over 17,000 deaths (conservative estimate) in 40 countries
- 95% of accidents occurred in developing countries
- Four countries, 10% of all countries, responsible for 50% of all accidents

Source: Worldwide Ferry Safety Association

Background

Issues

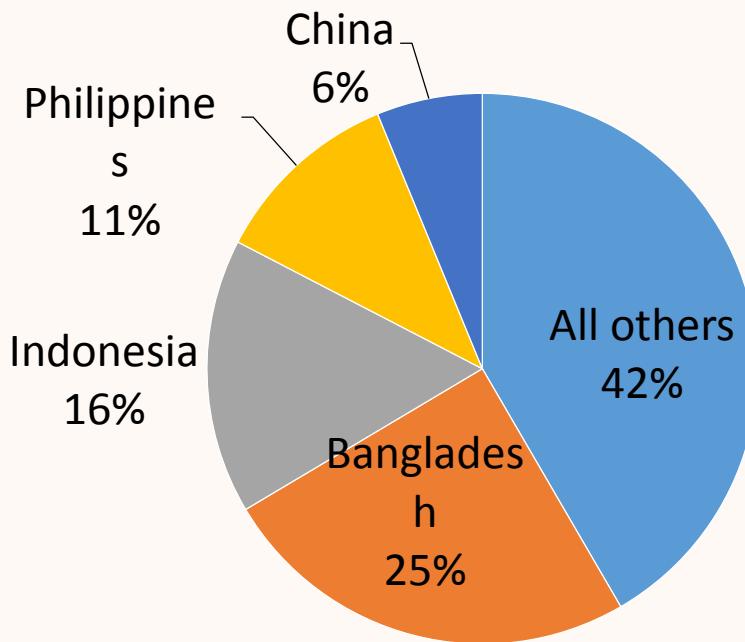
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## Top deadliest countries for ferry accidents

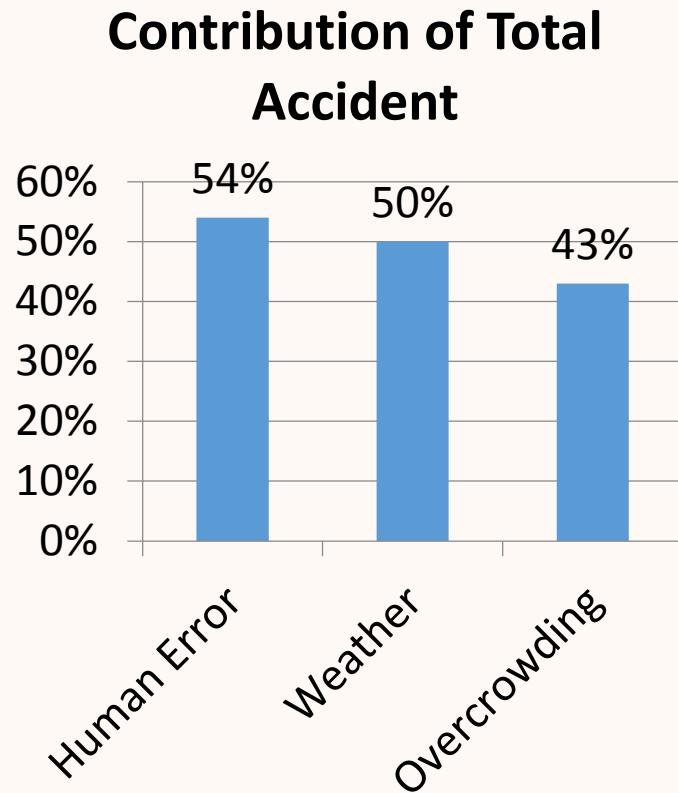
Bangladesh, Indonesia, Philippines have a number of islands. Especially Bangladesh and Indonesia believe Islam. Fatalities usually occur during pilgrim period



Reference: European Maritime Safety Agency (EMSA)



### Three main reasons affecting ferry accidents



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Abigail Golden

Worldwide Ferry Safety Association

Presented January 11, 2015 at the Transportation Research Board Conference

Workshop on Ferry and Passenger Boat Safety

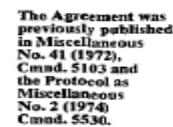
## **Related Regulations about international ferry by IMO**

# **Special Trade Passenger Ships Agreement, 1971**

## Rules

11. Spaces not fitted with bunks
  12. Areas to be deducted and marked
  13. Spaces fitted with bunks
  14. Marking of spaces
  15. Width of stairways

 Because “Special Trade Passenger Ships Agreement” is international agreement, this regulation can not compel domestic ferries



## **SHIPPING**

Treaty Series No. 7 (1980)

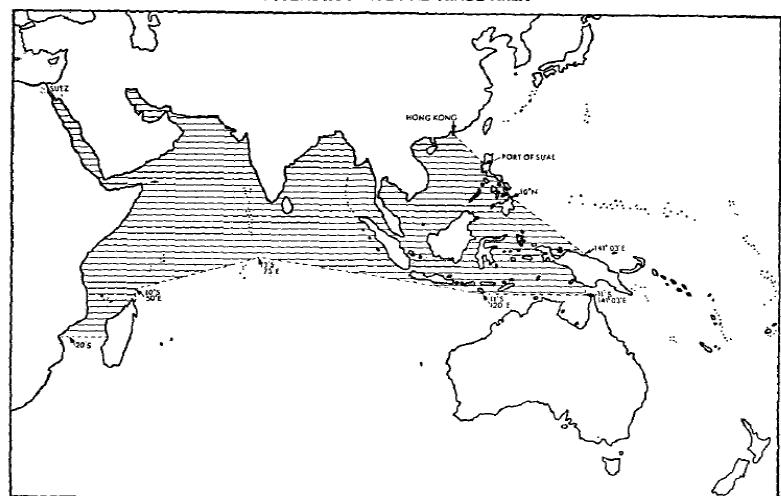
## **Special Trade Passenger Ships Agreement, 1971**

London, 6 October, 1971

with Protocol  
on Space Requirements for Special  
Trade Passenger Ships, 1973

London, 13 July 1973

**APPENDIX I - SPECIAL TRADE AREA**



## Trend of IMO Toward Domestic Ferry

### 2006 - 4 Demonstration Projects in Bangladesh in

#### Success

- ① Crew training program
- ② Computerized data base to help manage the status of upwards 20,000 vessels

#### Failure

- ① Advanced ticketing as a way to limit overcrowding
- ② Weather information system

### 2015 - Conference on the enhancement of safety of ships carrying passengers on non-international voyages, Manila, the Philippines, 24 April

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# **What are the core problems?**

## Main reasons affecting domestic ferry accidents in Bangladesh

### 5 Main Reasons

- I. Inconsistent regulations by each government
- II. Overcrowded ferry because of the extremely low price established by government
- III. Uneducated crews
- IV. Absence of weather forecasting system in tropical climate
- V. There are no space assigned life vest because of overcrowding

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**Let's move on Recommendations!**

### New convention about domestic ferry in IMO

New convention need to contains appropriate technologies and regulations



“Casualties and incidents involving domestic ferries can be avoided if adequate laws, regulations and rules are developed and effectively implemented and enforced,”

Mr. Koji Sekimizu  
Secretary-General (before)

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## Crew Training Program

Bangladesh demonstration project 2006



- Crew training program reduces human error
- The course already established by Interferry and IMO
- The next government in Bangladesh didn't follow up on the course



**Revive the training course IMO and Interferry established before**

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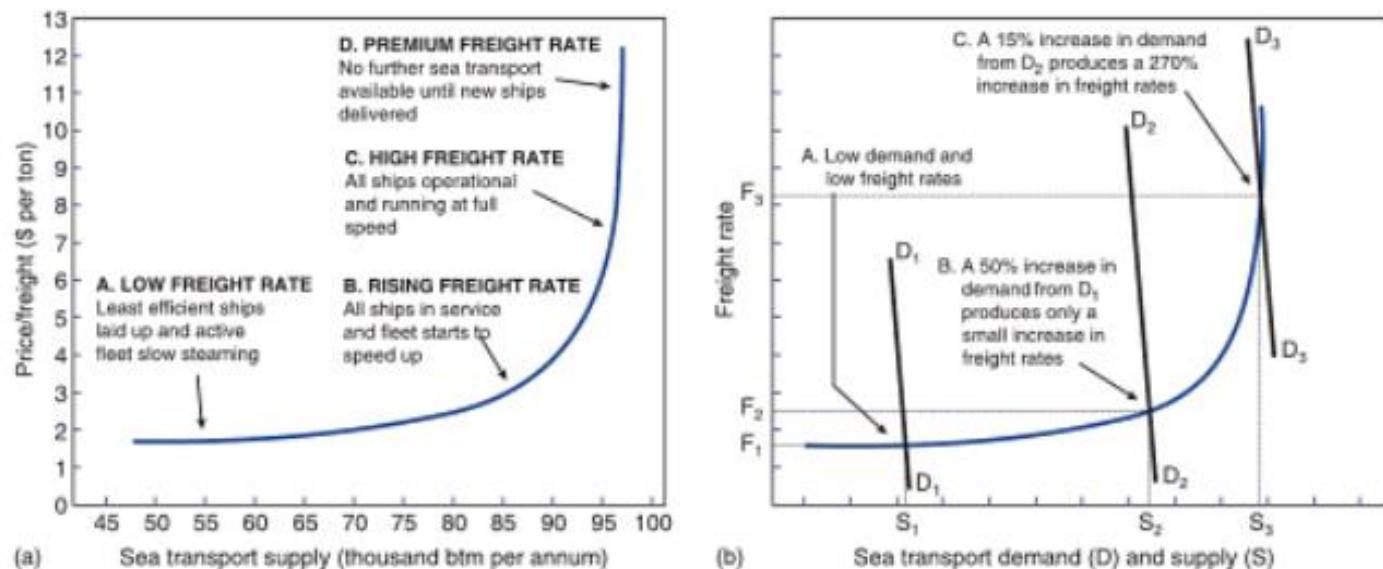
Conclusion

# Recommendations 2

## Overcrowding

### General Supply Curve of Shipping Market

In shipping market, when demand increase fast, supply hardly sufficient demand because of it's industrial character.



**Figure 4.14**

Short-run equilibrium: (a) short-run supply function; (b) short-run adjustment

Source: Martin Stopford 2007

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**Supply elasticity is very low in shipping market  
(short term)**

Source: Stoford martin, 2009, Maritime economics

# Recommendations 2

Overcrowding

## Supply Curve of Shipping Market

To solve lack of supply of ferry, IMO need to make the guideline, change the operating limits

- Bangladesh government establish passenger ticket extremely low
- There are a lot of demand but few supply



- Second hand ship
- Converting process
- Sail as passenger ferry

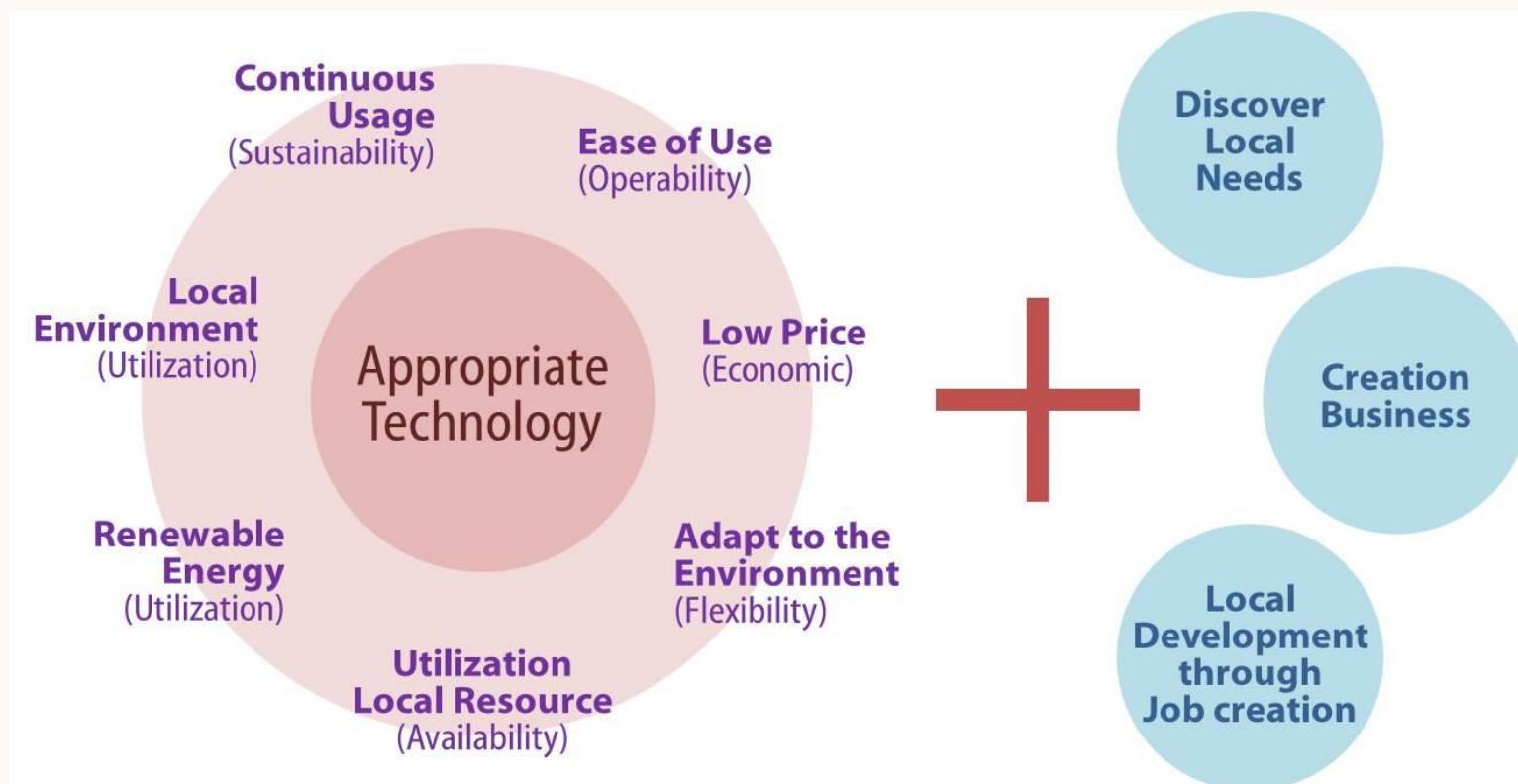


### What is Appropriate technology?

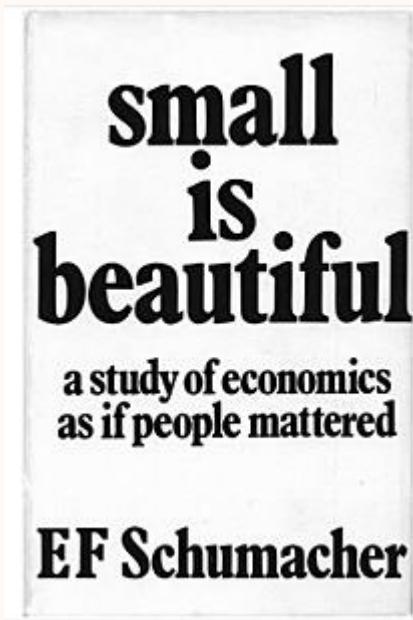
**“Design for the 90% of Us”**



Roberta Weisbrod



### Examples of Appropriate technology?



- Not the best but...  
Useful and reasonable



## Personal rescuing device



CO2 cartridge:  
less than **0.8\$** per each



Rescue tube:  
Less than **1.5\$** per each

[www.ebay.com](http://www.ebay.com)

## Personal rescuing device

Total 2.5\$ liberally. Because of the scale of economies, we expect the price could be **much less than 2.5\$**

Step 1



Step 2



Step 3



Background

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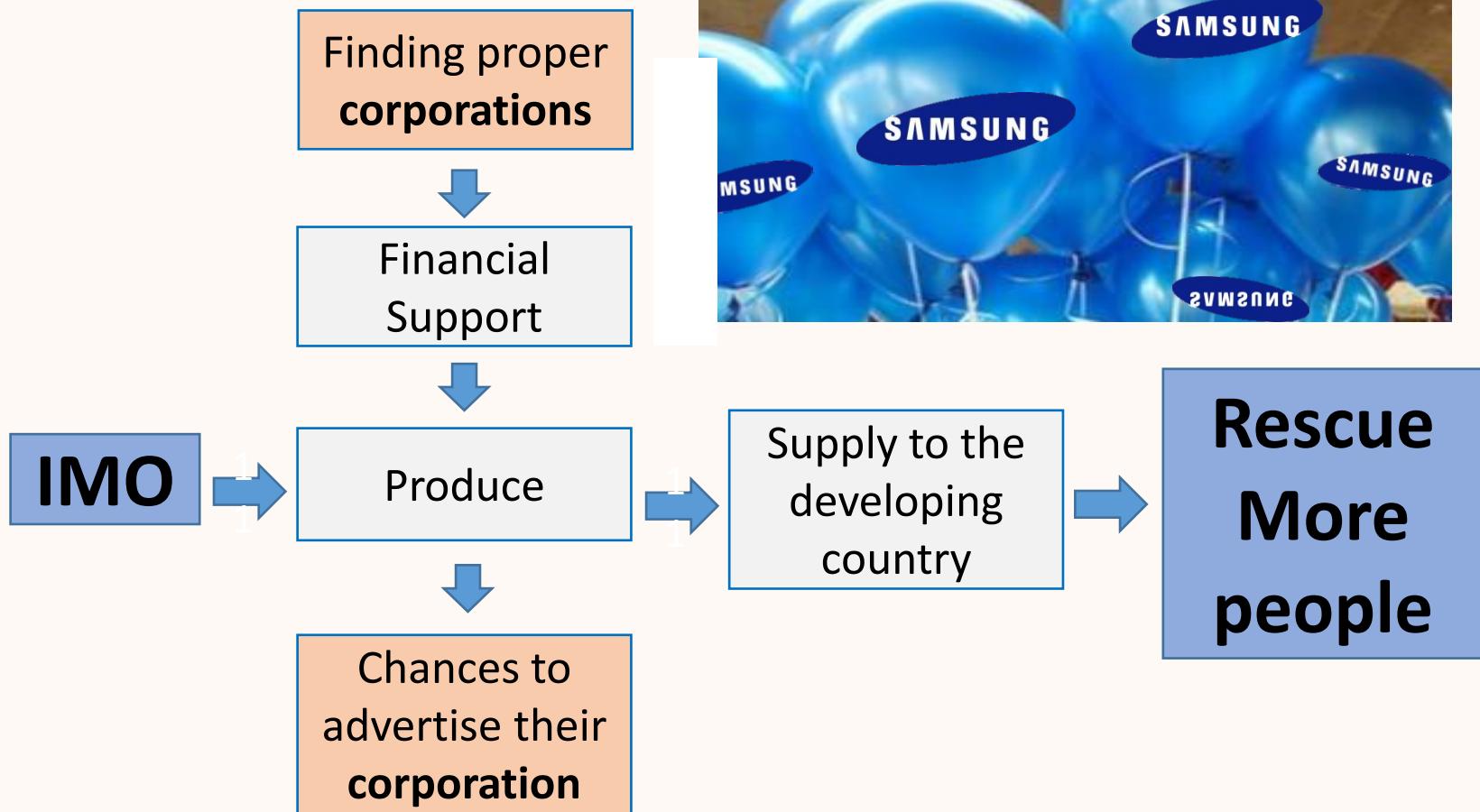
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$$1,000,000 \text{ people} \times 2.5\$ = \mathbf{2,500,000\$}$$

### Personal rescuing device market ecosystem

Not just simply give but make the market ecosystem



## Weather Forecasting System

RANET Chatty Beetle is one of the solution



Link



### Chatty Beetle

Basic warning for sudden cyclones, tsunami or other hazards

- Ruggedized
- Alerts, notifications, and acknowledgement
- Two-way messaging
- Low battery



Possibility to Be Linked  
Mobile Systems

### Problems & Solution

1. Inconsistent regulations by each government



**New convention about domestic ferry**



2. Overcrowded ferry



**Using second hand ships converting to cover demand**



3. Uneducated crews



**Utilize existing education program consistently**

## Problems & Solutions

4. Absence of weather forecasting system in tropical climate



**Appropriate technology - Chatty Beetle**



5. There are no space assigned life vest because of overcrowding



**Appropriate technology - Rescuing device**



Using appropriate technology to solve the problem.  
Cooperating with “UN appropriate technology committee”

**Thank You for listening!**

**Q & A**

# Appendix

1. Causes and Circumstances of Major Ferry Accidents, 2000–2014, Abigail Golden, Worldwide Ferry Safety Association Presented January 11, 2015 at the Transportation Research Board Conference Workshop on Ferry and Passenger Boat Safety
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6. 2014, Contemporary issues in domestic ro-ro passenger ferry operation in developing countries : identification of safety issues in domestic ferry operation based on accident investigation reports on ferry involved accidents in Indonesian waters, 2003 – 2013, Aleik Nurwahyudy, *World Maritime University*

# Appendix

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9. <https://www.yumpu.com/en/document/view/12330058/ranet-chatty-beetle-iepas>

10. <http://cafe.naver.com/golum/287537>

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12. Ferry Transport: The Realm of Responsibility for Ferry Disasters in Developing Nations *Catherine T. Lawson, The University at Albany Roberta E. Weisbrod, Partnership for Sustainable Ports*

13. UNCTAD