

An Insight into the Maritime Accident Characteristics in Bangladesh

Md. Imran Uddin¹, Dr. Zobair Ibn Awal^{2,*}

¹Accident Research Institute (ARI),

²Department of Naval Architecture & Marine Engineering (NAME),
Bangladesh University of Engineering & Technology (BUET), Dhaka-1000, Bangladesh.

Abstract

The inland waterway plays a very important role in the transportation system of Bangladesh. But, due to severe deficiencies in the safety aspect a lot of accidents take place almost every year in the inland waterways that cause considerable loss of human lives and assets. The inland waterway accidents in Bangladesh during 2005 to 2015 were analysed statistically in the present study. It has been found that the leading cause of accidents is collision among vessels and fatal injury comprises considerably higher proportion of total casualties. The study also revealed that cargo vessels and passenger vessels are generating more accidents in comparison to other types of vessels. It was also observed that during fair weather and good visibility condition significant proportion of accidents has taken place. Based on this study several recommendations have been put forward for improving safety in the inland waterways of Bangladesh.

Keywords: Inland waterway; accidents; collision

Introduction

Bangladesh has a massive inland waterway network including 700 rivers [5]. In some areas of the country it is the only mode of transportation. The length of navigable inland waterways is about 5,968 km. But during dry seasons it reduces to 3,600 km. The inland water transportation system plays very significant role in the national life of Bangladesh. The inland water transportation system is popular for being relatively cheaper mode of transportation. A considerable proportion of passengers, industrial products and many other goods are transported through the massive network of waterway inside the country. Due to the increasing demand of cheaper transportation and growing economy the number of the vessels has increased compared to the previous years. At present there are more than ten thousand registered vessels in Bangladesh. But there are also lots of unregistered vessels and boats that use to ply over the waterway network of the country.

But the condition of safety in this mode of transportation is not up to the mark. Each year lots of people are being died, injured, reported missing and many valuable goods are lost or damaged due to the accidents in the inland waterways. This causes considerable loss in the national economy of Bangladesh. The accident investigations for the past few years revealed that over eight thousand people have died, injured and found missing due to the maritime accidents [3].

Literature Review

Several studies have been carried out regarding maritime accidents of Bangladesh. It was observed that the number of in depth analysis of maritime accidents in Bangladesh is quite few. One of the main reasons behind the fact is that the available data is not enough to carry out detailed analysis of accidents. Most of the studies were based on statistical analysis of the accidents.

A study by Awal [1] investigated the maritime accidents of Bangladesh during 1995 to 2005. The study considered 197

accidental cases and revealed that overloading, cyclone and collision were the major causes of inland water transport accidents in Bangladesh. Another study by Awal *et al.* [4] analyzed the collision type of accidents during 1981 to May 2007. The study found that cargo vessels and passenger vessels were responsible for the occurrence of seventy five percent of all accidents due to collision. The application of Geographical Information System (GIS) was made by Chowdhury [7] to analyze the inland water transport accident characteristics of Bangladesh. Baten [6] discussed some problems of the maritime transportation sector of Bangladesh. To improve maritime safety in Bangladesh a proposal of developing classification society was made in that study. Awal & Hoque [2] analyzed the maritime accidents during 1991 to 2005 and found that fatal injuries comprised a considerably higher proportion of total casualties. The study also pointed out some major drawbacks of maritime accident investigations of Bangladesh. Recently Uddin *et al.* [8] analyzed the inland waterway accidents of Bangladesh during 2005 to 2015. The Geographical Information System (GIS) was applied to analyze the accident locations and it was found that the waterways of Barisal, Chandpur and Chittagong districts were the most vulnerable zone for the occurrence of inland waterway accidents. One of the major findings of the paper was that about forty five percent vessels ultimately sink under the water after the occurrence of the accident.

Accident Data Collection

The maritime accident data were collected from the Department of Shipping of Bangladesh (DOS) and Bangladesh Inland Water Transport Authority (BIWTA). The accident data stored in these reports are not standard. Many important parameters of the accidental event are not specified in these reports. It is important to mention that, the road accident report form of Bangladesh Police contains 67 different parameters of a particular accidental event. But there is no such comprehensive form for maritime accidents in Bangladesh. The accident description is made in a very short format from which very limited analysis can be made. During the years 2005 to 2015 overall 229 accidental cases have been found with the involvement of 381 vessels and boats.

Analysis of Accidents

Accident Type

The vessels face different type of accidents in the inland waterway of Bangladesh. Among them, collision, adverse weather, overloading, stability failure, excessive current, bottom damage are noteworthy. "Figure 1" shows the percentages of the maritime accidents in Bangladesh. It is observed that collision (60.3%) by the vessels is the main cause of accident. 92% of this collision takes place by the contact with other vessels. The rest 8% takes place by the contact with any permanent obstruction on the waterway route.

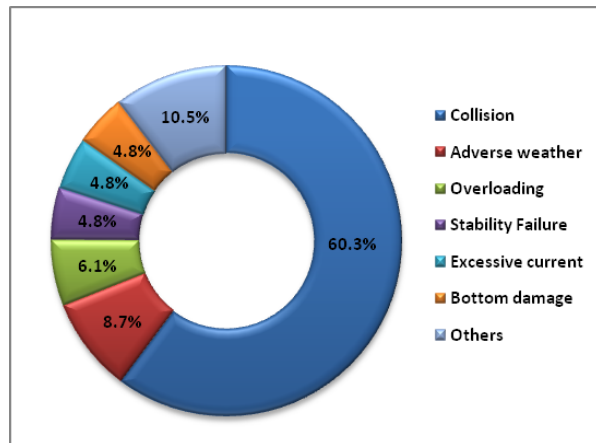


Figure 1. Percentage of different types of maritime accidents in Bangladesh

The probable reason behind this high percentage of collision accidents may be due to absence of sufficient navigational aids on waterway routes and less skill of the vessel drivers, masters and crews. The adverse weather related accidents (8.7%) generally take place during the monsoon season weather often remains rough in nature.

Casualty Analysis of Accidents

The yearly distribution of accidents and casualties are shown in "figure 2". It is evident that the curve of number of accident bears a resemblance to a wave shape form. That is number of accidents increase and decrease in a periodic manner. This is a very interesting issue and may be subject to further research and analysis. It is also observed that fatality constitutes higher proportion of the casualties. The number of injuries and missing remains almost steady over the last years.

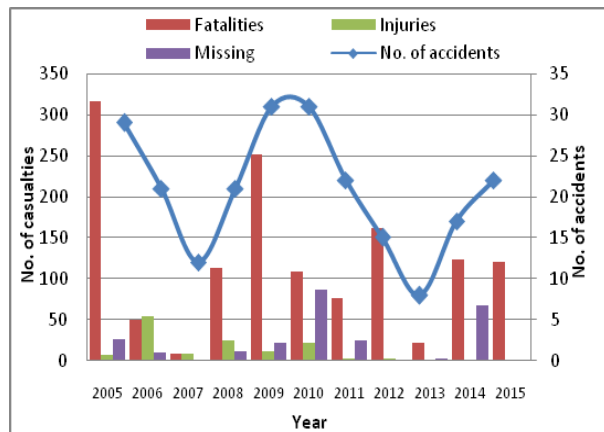


Figure 2. Yearly distribution of accidents and casualties

"Figure 3" represents the monthly distribution of accidents and casualties. It is observed that the number of accidents is higher particularly in the months of January, February and August. The fatality rate is quite high during the months of February to May, November and December. Again, during the months of January only nearly half of all the injuries take place. Missing of people due accidents mostly occurs during the months of May to August.

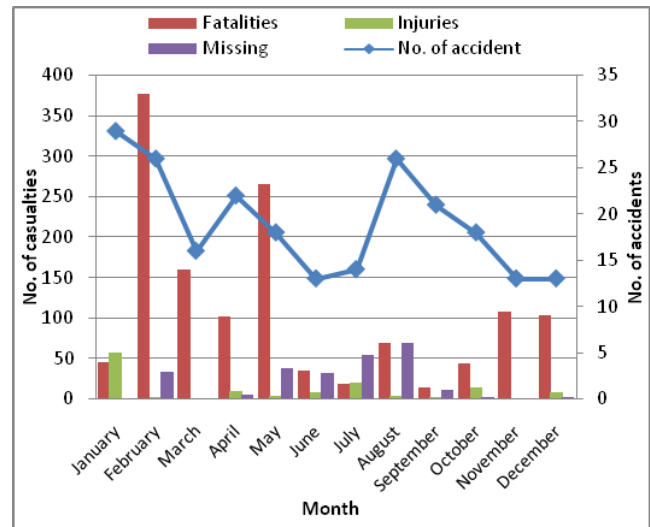


Figure 3: Monthly distribution of accidents and casualties

Type of Vessels

Many types of vessels were identified that experience accidents in the inland waterways of Bangladesh. The percentage of the vessels is shown in "Figure 4". It is evident that cargo vessel (27%) and passenger vessel (26.2%) face comparatively higher proportion of accidents. In addition, country boat and engine driven trawlers, oil tankers, and other different types of vessels were also found to experience accidents. But, for approximately one-third (32.3%) cases it was found that the vessel type was not specified in the reports. This created a barrier for effective analysis of the study.

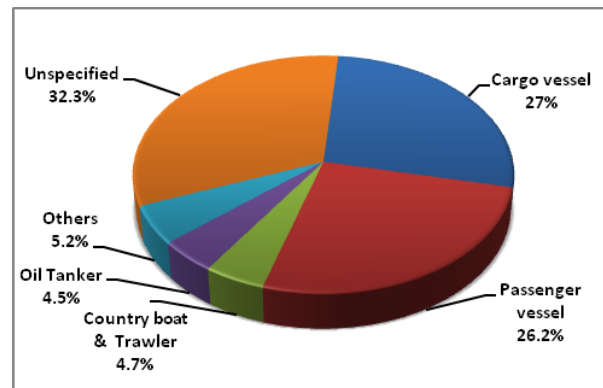


Figure 4. Percentage of type of vessels

Weather Condition

"Figure 5" illustrates the weather condition during the occurrence of accidents. It is seen that a significant percentage of accidents take place in fair weather condition which is a vital issue. The reason behind the fact is the involvement of operational error by the inexperienced personnel (masters, drivers, crews etc.) on the vessels. Apart from this, at foggy weather condition (21.8%) during winter season and stormy weather condition (18.3%) during monsoon season comparatively lower proportion of accidents take place. A study by Awal [3] showed that during 1995 to 2005 the higher percentage of accidents took place at stormy weather condition (58%). So at present the trend of accidents has changed from that of the previous years.

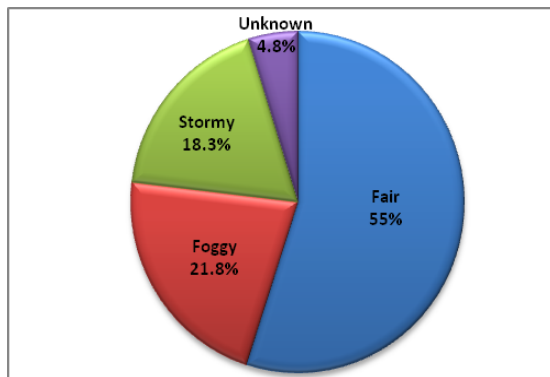


Figure 5. Distribution of accidents on the basis of weather condition

Weather Condition - Visibility Condition Cross Tabulation

From "table 1" it is observed that at good visibility condition more accidents take place in comparison to poor visibility condition. Here, a major drawback of the analysis was that in the accident reports the visibility condition was not mentioned significant proportion of accidents. It is also evident that at fair weather and good visibility condition slightly higher percentage of accidents takes place in comparison to poor visibility condition. Again, during foggy weather the accidents taking place in poor visibility condition is twice than the accidents in good visibility condition. But, during the accidents that has taken place in Stormy weather; the visibility condition was found good in most cases.

Weather condition	Visibility condition			Total
	Good visibility	Poor visibility	Unknown visibility	
Fair	44	40	42	126
Foggy	14	27	9	50
Stormy	20	7	15	42
Unknown	5	0	6	11
Total	83	74	72	229

Table 1: Weather condition - visibility condition cross-tabulation

Concluding Remarks

Research Findings

The research findings of the study can be summarized as follows:

- The leading cause of maritime accidents in Bangladesh is collision (60.3%) by the vessels.
- The main types of vessels that experience accidents are cargo and passenger vessels.
- The percentage of occurrence of accidents is higher in fair weather and good visibility conditions.
- The minimum and maximum numbers of accidents per year are 8 and 31 respectively. The average number of accidents per year is 20.82 having a standard deviation of 7.18.
- Many vital parameters of the accidents are not reported properly which indicates poor system of maritime accident investigation and data collection.

Recommendations

On the basis of the above study some recommendations for the improvement of safety situation in the inland waterways of Bangladesh can be outlined as:

- During foggy weather special care should be taken by the vessel drivers, masters and crews.

- By the implementation of strict enforcement Overloading of vessels should be prevented. Moreover, it should be ensured that during bad weather all the voyages must be cancelled.
- The arrangement for the installation of adequate navigational aids should be made on the required locations on the waterway. Moreover, it should be ensured that all the vessels contain sufficient amount of life saving appliances to be used during emergency situations.
- The fitness of all the vessels should be surveyed on regular basis. The design, construction and modification of any vessel should be done by the consultant of expert and experienced naval architects.
- Vessel drivers, masters, crews and other personnel relevant to the operation and maintenance of vessels must be trained up with regular and proper training programs.
- Effective maritime accident investigation should be conducted. Moreover, the accident reporting should include more parameters so that effective accident analysis can be carried out.

References

- [1] Awal Z.I., A Study on Inland Water Transport Accidents in Bangladesh: Experience of a Decade (1995-2005), Proceedings of the International Conference on Coastal Ships and Inland Waterways, Royal Institution of Naval Architects (RINA), 2006, London, pp. 67-72.
- [2] Awal, Z.I., Hoque, M.M. (2008). Some Aspects of Water Transport Accident and Injury Problems in Bangladesh, Proceedings of the 10th Pacific Regional Science Conference Organisation (PRSCO) Summer Institute, 15-17 May 2008, Dhaka, paper no. 6b2.
- [3] Awal, Z.I., Islam, M.R., Hoque, M.M., An Analysis of Passenger Vessel Accidents in the Inland Waterways of Bangladesh, Proceedings of the Marine Technology Conference 2006, University of Hasanuddin, Indonesia, pp. 211-219
- [4] Awal, Z.I., Islam, M.R., Hoque, M.M., Marine Vehicle Accident Characteristics in Bangladesh: Study on Collision Type Accidents, Proceedings of the 7th International Conference on Mechanical Engineering (ICME 2007), 29-31 December 2007, Dhaka, paper no. ICME-AM-46.
- [5] Banglapedia, Water Transport, National Encyclopaedia of Bangladesh, URL:http://en.banglapedia.org/index.php?title=Water_Transport
- [6] Baten, A.S.M.A., Internal Water Transportation System: Safety of Inland Passenger Vessels, Individual Research Paper, National Defense Course, National Defense College, Dhaka, Bangladesh, 2004
- [7] Chowdhury, A.S., Waterway Accident Characteristics Assessment and Information System Development, Master of Engineering (Civil and Transportation) Thesis, Department of Civil Engineering, Bangladesh University of Engineering & Technology, Dhaka, Bangladesh, 2005
- [8] Uddin, M.I., Islam, M.R., Awal, Z.I., Newaz K.M.S., An Analysis of Accidents in the Inland Waterways of Bangladesh: Lessons from a Decade (2005-2015), Proceedings of the 10th International Conference on Marine Technology (MARTEC 2016), 9-10 December 2016, Dhaka, Paper no. 43.