Safety Aspects related to Passenger Transportation in NW-1

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Introduction

- India has the largest navigable river length for the most part of the year is 14500 km (approx.)
- There are thousands of traditionally designed wooden country boats of various capacities operate in various rivers and canals by means of non mechanical sources of power and sails, etc. and by mechanised vessels fitted with diesel engines called as ***Bhutbhutis***.
- One of the major aspect of Inland water transportation is passenger and cargo movement.

National waterways

The government has declared national waterways (NW 1, NW 2, NW 3, NW 4, NW 5) & NW 6 (proposed).

Identification of NW'S	Geographical Stretch	Distance kms
NW-1	Ganga-Bhagirathi-Hooghly river (Allahabad- Haldia)	1620
NW-2	Brahmaputra (Dhubri-Sadiya)	891
NW-3	West coast canal (Kottappuram - Kollam stretch)	205
NW-4	Kakinada - Puducherry canals with Godavari & Krishna stretch	1095
NW-5	East Coast canal with Brahmani and Mahanadi delta river (Odisha)	623
NW-6	River Barak - between Lakhipur and Bhanga (Proposed)	121

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- It is therefore, necessary to exercise control over the country boats so that they provide a **safe means of transportation.**
- In IWT sector, the nature of operations, scarcity of trained technical crew and lack of safety standards etc.., pose number of risks to safety of passengers and vessels.
- Particularly boats plying in the Ganga stretch are made of wooden boats and are operated by unskilled operators

Scope of work

- The scope of work mainly deals with the country boats operated in the river Ganga and issues related to the safety of passengers & capital loss for owner.

- **Among these Bihar, West Bengal, and Uttar Pradesh** are considered, where the rate of accidents are high

Number of Inland vessels – Data from IWT Statistics – Bihar, West Bengal

Table 3A.4 : Statewise Number of Inland Water Vessels

(in numbers)

Sl. No.	State/UT	2002-03	2003-04	2004-05	2005-06	2006-07
1	Andhra Pradesh	1077	1077	1075	1075	111
2	Assam	..	..	..	..	267
3	Bihar	20	20	22	21	19
4	Goa	145	206	157	212	273
5	Karnataka	44	45	45	302	302
6	Kerala	4202	4164	4195	6970	9060
7	Maharashtra	..	334	106	447	512
8	Orissa	9	3	..	155	180
9	West Bengal	1903	1935	1972	2084	2182
10	A&N Islands	34	36			
	Total (reporting states)	7434	7820	7872.00	11266	12906

.. : Not reported.

Source : Statistics of Inland Water Transport published by TRW, M/o Shipping

Statistics of Inland Water Transport published by TRW, M/o Shipping (2003-2007)

Statistics of Inland Water Transport (2008-2012)

IWT ACTIVITIES – STATE GOVERNMENT

32. The number of vessels deployed and volume of cargo carried on Inland Waterways across the reporting States & UTs is given in Table 9.

Table 9: Number of Inland Water Vessels and Cargo Carried – State wise

State/UT	Number of Vessels				Volume of Cargo Carried (thousand tonnes)			
	2008-09	2009-10	2010-11	2011-12	2008-09	2009-10	2010-11	2011-12
Andhra Pradesh	111	111	111	111	...	...	...	...
Assam	240		....	209	865.15	...	...	37.72
Bihar	21	21	21	138	...	...	...	2.40
Goa	191	193	188	172	11901.32	13897.38	14563.49	14469.90
Karnataka	49	39	39	473	159.00	986.75	1033.80	3887.00
Kerala	9230	9756	13295	5513	5129.01	5092.08	5285.56	5756.12
Maharashtra	662	691	781	603	9963.00	12510.00	14870.00	19950.00
Orissa	157	260	281	279	...	...	...	...
West Bengal	2321	2484	2561	2635	3644.00	17705.00	9987.00	9996.00
TOTAL (reporting states)	12980	13555	17477	10133	31661.48	50191.21	40739.85	54099.14

... Not Available

Number of Inland vessels – Data from IWT Statistics – Bihar, West Bengal

IWT ACTIVITIES – STATE GOVERNMENT

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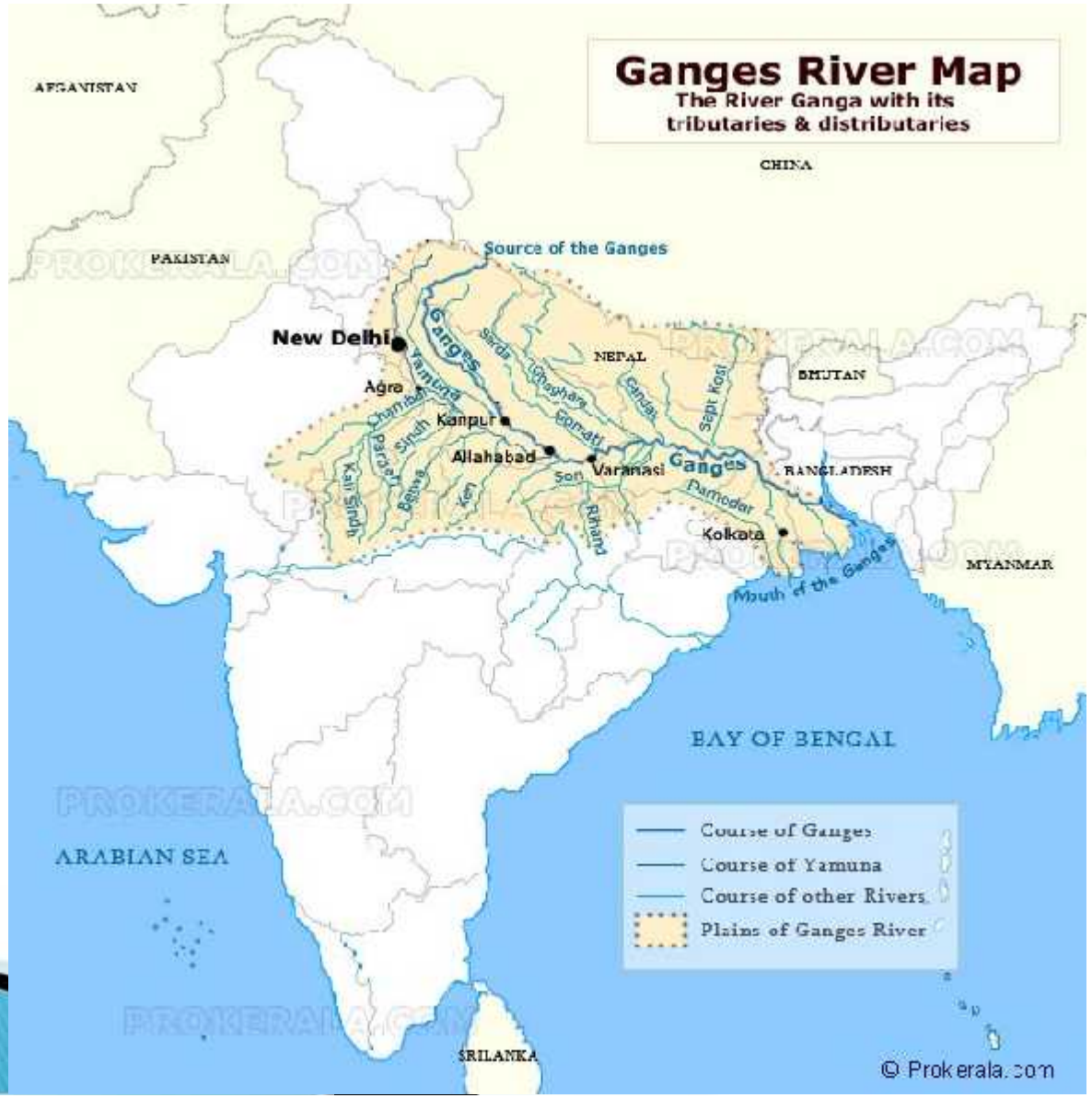
Table 9: Number of Inland Water Vessels and Cargo Carried – State wise

State/UT	Number of Vessels				Volume of Cargo Carried (thousand tonnes)			
	2010-11	2011-12	2012-13	2013-14	2010-11	2011-12	2012-13	2013-14
Andhra Pradesh	111	111	…	…	…	…	…	…
Assam	…	209	22	173	…	37.72	71.79	338.53
Bihar	21	138	138	138	…	2.40	2.40	2.40
Goa	188	172	313	159	14563.49	14469.90	3275.82	284.17
Karnataka	39	473	66	66	1033.80	3887.00	78.40	58.72
Kerala	13495	5513	13821	13689	5285.56	5756.12	5555.21	2831.87
Maharashtra	781	603	577	588	14870	19950	24196	24774
Orissa	281	279	342	…	…	…	…	…
West Bengal	2561	2635	2623	2042	9987	9996	10347	11452
TOTAL (reporting states)	**17477**	**10133**	**17902**	**16855**	**40739.85**	**54099.14**	**43526.62**	**39741.69**

… Not Available

Statistics of Inland Water Transport (2010-2014)

Basic Information about the Ganges River of India



Basic Information about the Ganges River of India

Total Length of River Ganges	2,510 Kms (1,560 miles)
Average depth of Ganga River	52 Feet (maximum depth, 100 feet)
Place of Origin of Ganga River	Foot of Gangotri Glacier, at Gaumukh, at an elevation of 3,892 m
Area drained by Ganges River (Ganges Plains)	1,000,000 Square Kilometres
Major Tributaries of Ganges	Yamuna, Son, Kosi, Gandak, Gomati, Ghaghara, Bhagirathi etc...
Cities on the bank of Ganges	Kanpur, Soron, Allahabad, **Varanasi, Patna,** Ghazipur, Bhagalpur, Mirzapur, **Buxar,** Saidpur etc...

SMDR Projects Pertaining to Inland Waters

- RP003 - "Study and Modernisation of Design and Construction of Country Craft operating in Coastal and River Waters “

- RP004 - "Emissions from Vessels operating in Indian Coast, Inland Waterways and Harbour Craft“

- RP005 - " Safety Assessment Studies on Passenger Vessels in Andaman Nicobar Islands, Lakshadweep Islands and Inland Waters"

Need For the Study

- There are thousands of vessels plying in the inland waters & coastal regions, which are operated and monitored by various agencies i.e. IWAI, state tourism departments, private operators etc.

- Even though there are rules and regulations for registration & operation of vessels / boats, as per the study it is observed that accidents are occurring frequently and there have been several casualties in the past.

- IMU(V) has been ***"Conducting Safety Assessment studies on Passenger Vessels in Andaman Nicobar Islands, Lakshadweep Islands and Inland Waters"*** awarded by Ministry of Shipping.

Data Collection

- Data collected from various locations of Inland Waters related to boat accidents, operations, safety etc..
- Tours visited - Godavari stretch (NW-4) , A & N Islands, Kerala (NW-3), Goa, Karnataka, West Bengal (NW- 1) & Odisha (NW-05) - met various IWT officials, boat operators and other stake holders – identified hazards during physical operations.

Tour visit – West Bengal, Bihar (NW-01) during the month June 2014 and the observations were recorded as follows…

Observations - West Bengal and Bihar

West Bengal Tour observations

Duties of Regulating authorities –

- Control of water vessels in west Bengal
- The Inland waterways authority of India and west Bengal surface transport department are the two regulating organizations that will control the inland water vessels in west Bengal.
- IWAI will develop the waterways & some of their terminals for cargo operations.
- The remaining unrecognized boats are under in the respective panchayats.
- The rules that are used in certification of boats is under the Inland vessels act 1917.

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The following services are provided by state department are

- Registration of vessels both mechanized and non-mechanized plying in the inland waters and collects registration fees as per rules.
- Endorsement of certificates of competency issued by the other states of India.
- Issues certificates of competency for engine driver
- Extension of survey certificates. .
- Supply of hydrographic charts as per the requirement of the public.
- Conducting safety mock drills every Saturday at respective jetties
- Giving personalized training for crew members.

Observations - West Bengal

- Team observed that registered and unregistered vessels are not following any safety measures onboard.
- There is no one to restrict the number of persons allowable to carry per vessel.
- For some vessels there are no escape routes in case of any unintended events.
- The jetties are not in proper condition.
- Some vessels are operating in the channel of Bulk carriers & tankers.
- Some of the vessels crew has no idea regarding safety measures.

Hazards Identified At Various Locations of West Bengal

Steel vessel has the carrying capacity of 400 passengers, but there are no LSA or FFA according to the capacity

Passengers disembarking, while the vessel is berthing-Human Behaviour, Babughat, Kolkata

Contd...

Unregistered wooden vessels in poor condition & huge crowd at the jetty- Dakshineswar ghat

Unregistered vessel without any LSA Batanagar

Varanasi Tour observations

There is **no state** owned IWT department in **Uttar Pradesh for vessel registration** and for other activities.

- In Varanasi the approximate numbers of vessels are 2000
- No LSA found on the vessels which are operating in Varanasi
- No authority to monitor the vessel operations
- **In Varanasi average number of passengers/pilgrims using the vessels are nearly 5000 in lean season and more than 5000 in full season**
- During festival/ Mela times **"Jal Police"** will control the crowd

Allahabad Tour observations

- There is no boat registering authority in Allahabad.
- However **Mela samiti** will give **license to the boat operators** and they have to renew their license every year.
- **No physical verification of the condition of the vessels**
- The approximate number of boats in Allahabad are **1000.**
- Average number of **carrying capacity is 8-10**, but the operators are carrying more than 10 pilgrims.
- The amount that they are collecting per trip is Rs 150/- per head.

Hazards Identified near sangam

Vessels lined up in the middle of a stream without proper support –very dangerous, Sangam, Allahabad

Condition of the floating jetty is bad-
Boat Club, Allahabad

Contd…

No Safety (LSA) on the vessel, Varanasi

Vessel overloaded, Sangam, Allahabad

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Human Behaviour- Passengers leaning on the side of the vessel to touch the water, chance of vessel capsize-Varanasi

Unregistered vessels without LSA, Gandhi ghat, Patna

Boat Accident in Bihar, West Bengal and Uttar Pradesh (2010-2014)

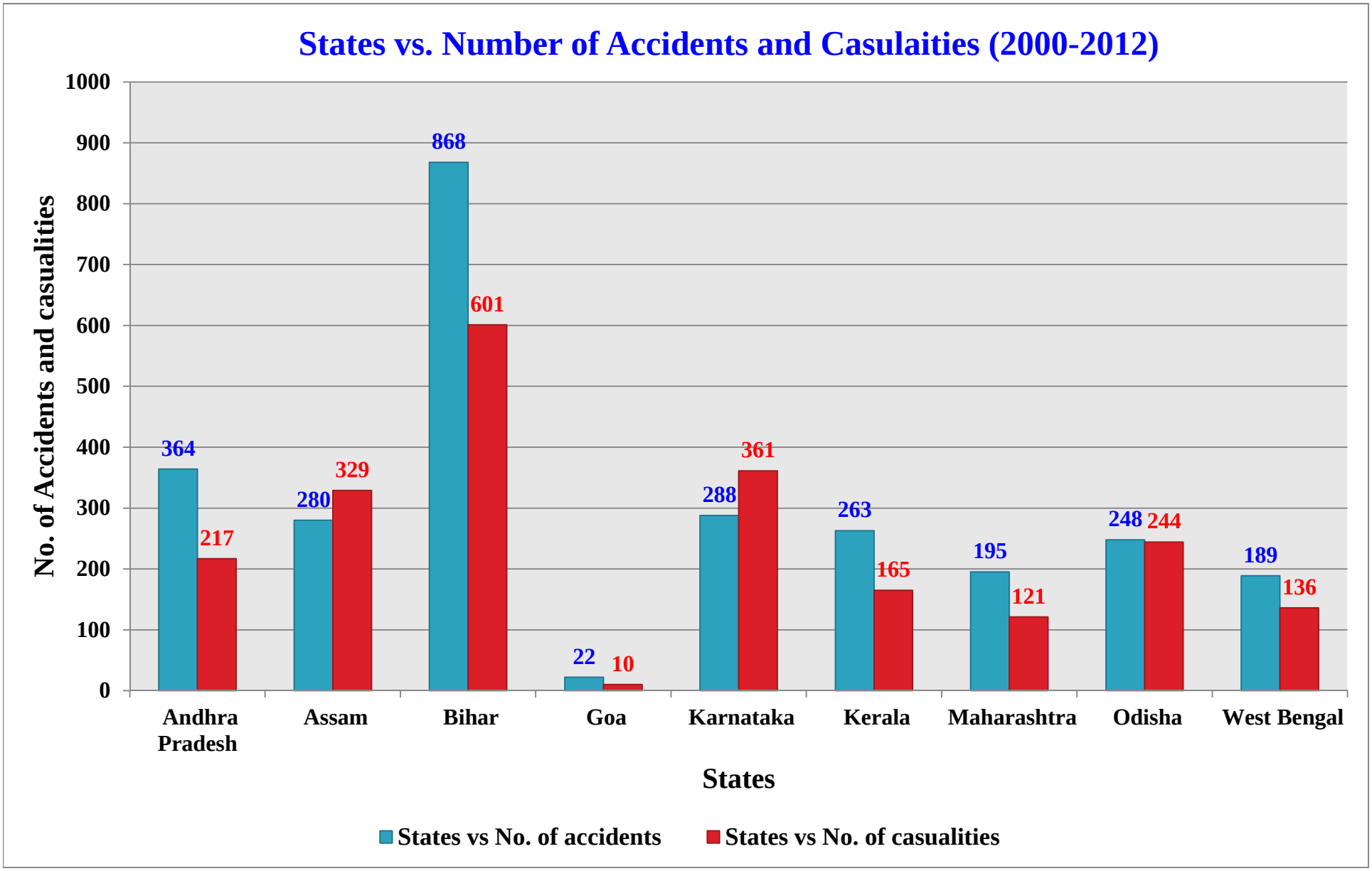
Source : Internet Archives

S.No.	Day and Month	Place	Type of Craft	Fatalities confimed dead (Minimum)	# of Passenge ron board	Cause	(Location) Waterway and characteristics
1	January 3, 2010, Sunday	West Bengal	Country Boat (fishing boat)	19	29	The boat sank because it was overloaded, the oarsman could not take the boat further and it capsized.	Rupnarayan River near Kolaghat in East Midnapore district
2	June 13, 2010	Uttar Pradesh,	Boat	42	65	Turned over in the fast-flowing water caused by overcrowding fast-flowing water, poor maintenance of vessels and a lack of life jackets and other safety equipment.	River Ganges in Northern India
3	July 2, 2010	Bihar - Patna	Boat	9	65	Boat capsized due to overloaded boat ferrying	Gandak to Bhawanipur diara from Ghoradia Ghat
4	August 12, 2010	Bihar - Patna	untry bo	50	50	Boat sank	Kosi river in Supaul district , Bihar, caught in a whirlpool near Hari panchayat area
5	11-10-2010, Monday	Bihar state	untry bo	38	70	Boat capsized(tilted) due to over loading	River Ganges in the Buxar District in the state of Bihar
6	17 Oct 2010 Sunday,	Bihar state	Boat	7	40	Capsized	Baharao Chakia village in Bihar's Patna district.

S.No.	Day and Month	Place	Type of Craft	Fatalities confimed dead (Minimum)	# of Passenge ron board	Cause	(Location) Waterway and characteristics
7	October 30, 2010	West Bengal	Trawler	152	200	sank after hitting a sandbank the trawler overloaded with pilgrims	Muriganga river in the eastern state of West Bengal
8	Apr 24, 2013	West Bengal	Boat	15	45	boat capsized due to overcrowding. carrying bikes	West Bengal's Howrah distric
9	Jun 15, 2013	West Bengal	Boat	40	60	overcrowded	Ganga river in Manikchak area of Malda district in West Bengal
10	July 16, 2013	West Bengal	Country Boat	3	22	Capsized	Malda district of West Bengal.
11	August 11, 2013	Bihar	Country Boat	1	35	labour lost on board lost control and capsized flood water	Bihar's Bhagalpur district
12	August 20, 2013	Bihar	Country Boat	11	22	Boat toppled and capsized	River Ganga in Bihar's Begusarai district
13	January 29, 2014	Bihar bauxar district	Country Boat	9	23	Overcrowded	Ganga River in Bihar's Buxar district
14	04-Aug-14	West bengal	Fishing trawler	7		Strong winds	Bay of Bengal in West Bengal
15	August 5, 2014 Tuesday,	**Ganga river**	Mechanis ed Boat	30	60	Overcrowded	Ganga river in Rohania area in Mirjapu

S.No.	Day and Month	Place	Type of Craft	Fatalities confimed dead (Minimum)	# of Passenge ron board	Cause	(Location) Waterway and characteristics
16	November 16,2014	Ghagra river	Boat	6	40	Overcrowded	Ghagra while crossing over in Basti district
17	Jul 17, 2014 at 07:59am	Bihar	Boat	2	30	Capsized	Bagmati river in Bihar's Samastipur district
18	2014, late night	Bihar	Boat	6	60	Capsized	Ghat under Nuwaon block, Bihar
19	Mar 01,	Uttar Pradesh	Boat	12	NM	Overturned in the middle of the river	Mahona River capsized near Elona Ghat in
20	Feb 13, 2014	Uttar Pradesh	Boat	5	6	Capsized	Baghar lake in Barabanki district's Ramnagar area, on the outskirts of Lucknow.
21	Nov 01, 2014, Saturday	Bihar	Boat	12	16	Capsized	Garhi dam of Bihar's Jamui district

Graph representing the Boat Capsize data for (2000 -2012) - Source from NCRB



Hazards Identified At Various Places

Godavari Stretch - Unsafe Transferring of Person

West Bengal - Unregistered Wooden Vessels Overloaded with passengers and bicycles

Assam – Overloaded And No Life Saving Appliances

Assam – Improper-Gangway - Chance of Falling

Observations

- **Major reasons for boat accidents** – Overloading and environmental factors.
- Unsafe operational practices by boat operators (ex. boat to boat transfer).
- No authentic persons to control over crowd and no safety appliances (LSA & FFA...).
- Insecured gangways and jetties used for embarkation and disembarkation of passengers.
- Maximum number of boats plying in inland waters are unregistered.

Options To Mitigate The Risk

- The boat owner may provide the safety instruction booklet to the passengers onboard
- The boat operator / the crew should give instructions to the passengers about how to wear the lifejacket.
- The boat operator should ensure all the safety appliances onboard the vessel before plying.
- Infrastructure like jetties and gangways for passenger embarkation and disembarkation need to be provided by the appropriate authority.
- The boat to be designed such that there should be easy escape access to the passengers in case of any emergency situations.
- Periodic survey of the vessel
- Checklist has to be prepared for the inspection of the boat by the regulating authority **(Ref: Safe boat inspection – Kerala)**

Conclusion

- From the study, one can observe that the boat accidents occur mainly due to Human activities onboard or overcrowding.
- Hence, instead of changing the Hull material from Wood to Steel or FRP, one may consider on way of restraining people movement from one side another side and how to limit the number of passengers onboard to the carrying capacity of the vessel.
- Steel may be considered as Hull material, where the chances of grounding may be severe.
- If the boats were built as per the rules and regulations, the chance of avoiding the accidents can be maximised.

Thank you for your attention!