THE ECONOMIC VIABILTIES OF INDIA'S INLAND WATERWAYS

1. M.Vinay Kumar,Tolani Maritime Institute,Induri,vnykmr11@gmail.com
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3. Shaun Bruno Fernandes, Tolani Maritime Institute, shaun.fds1@gmail.com

ABSTRACT: India has never been able to thrive to its potential, when it comes to making full use of its inland waterways. We believe that this could be because of the lack of interest that the country gives to dredging operations. In this paper, we will be proposing a commercial model of a dredger and its operation. This will aim at showing the beneficial aspects of investing in dredgers as well as an idea as to what is required to build and run such as vessel from a commercial viewpoint.

SUMMARY: India's inland waterways are not an aspect that is been currently looked upon as a source of economy and easy transportation. Despite having projects of iron ore in Goa or the fact that Mumbai includes ferries in its public transportation system, water transport in India still has not reached the limelight. However, knowledge of the potential of an idea is the key to moving forward with it and in this paper we aim to throw some light onto the subject of inland waterways development. We will cover the following aspects; the economics involved, limitations faced, how these limitations are addressed and how development through dredging and water-bridging can be done before indicating the advantages of investing in these waterways.

1. INTRODUCTION

India is a country that is rich with abundant resources. However, we are not able to capitalise on them unlike some of the other developed countries in the world. One such example is the effective use of our inland waterways. Currently, only six major waterways, have been designated as National Waterways. In respect to a commercial viewpoint, the most important sectors are the Zuari and Mandovi rivers and the Cumbarjua in Goa. The question remains as to why India, being a very large country has not invested in this area but this paper is intended only to throw some light on the benefits that could be reaped if inland water ways could be utilised more efficiently.

Inland waterways on an whole could be better utilised for a commercial standpoint if not to cater for domestic need such as transportation. This paper also aims at throwing some light on the limitations being faced and what can be done to overcome this.

The paper will be structured to first approach the geographic statistics of India's inland waterways, then it will move on to inform about the current commercial stance and how usage of inland waterways can be better utilised. The paper will end on a note on what can be done to improve the situation, namely how dredging can be used to make better use of this resource.

1.0. Geographical standpoint

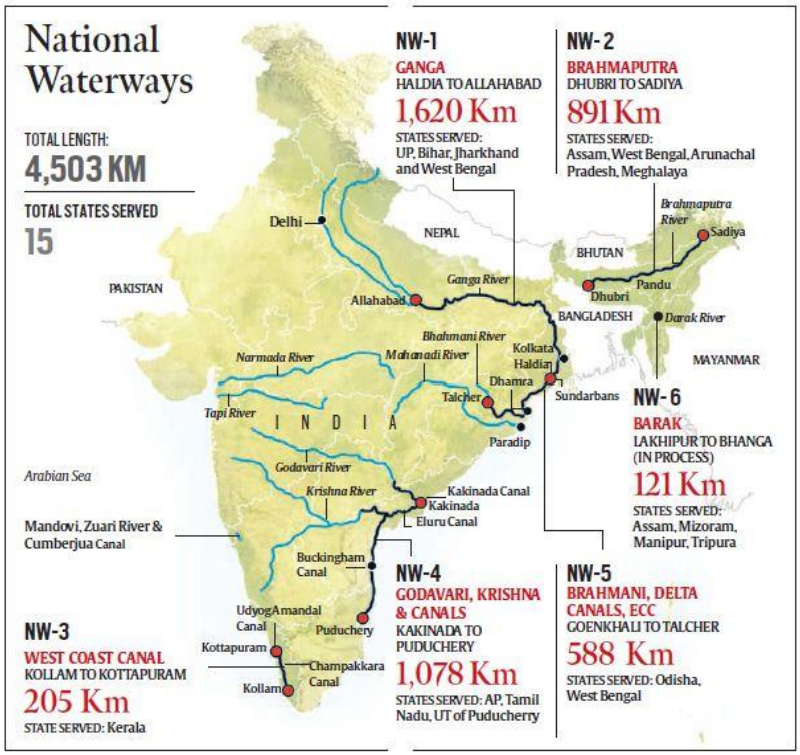
'India has about 14500km of navigable and potentially navigable waterways of which around 55% is used regularly.' (Wikipedia – Inland waterways of India). It is this non-navigable waters that we want to focus on in this paper. Normally the reason for many of these waters to be non navigable is because there is not sufficient depth. In the past the solution to a problem like this would have required a lot of thinking over, apart from its feasibility concerns but thanks to the inception of dredging, this is no longer a far fetched ideology. In this paper we will only limit our ideas with reference to increasing the depth of a waterway and not consider increasing its width.

Some of the other reasons for not being able to work on non-navigable waters include reasons related to environmental importance or because of technicalities in engineering or adverse effect on people.

There are six National waterways currently in India:

- Ganga-Bhagirathi-Hooghly system (NW-1) -1620 km
- Brahmaputra system (NW-2) – 891 km
- West Coast canal system (NW-3) – 205 km
- Kakinada-Pondicherry stretch of canals (NW-4) – 1078 km
- Talcher-Dharma stretch of rivers (NW-5) – 588 km
- Lakhipur-Bhanga stretch of the Barack river (NW-6) – 121 km

Here are the locations of these waterways on the map of India.



Source- http://images.indianexpress.com/2015/08/national.jpg

2. Commercial Aspects

Commercial uses of inland waterways involve the transportation of cargo, people or any commodity in general. Here we will look at each of the aspects in turn but on a general note, it cannot be denied that water transport is one of the cheapest and effective means of transporting cargo as compared to any other medium. Apart from being cheap, water transport is even known to burn less fuel per unitised cargo than any other means making it less damaging to the environment. These are just few of the major advantages of water transport and we will look at some more of them later.

2.1. Movement of cargo

With respect to the viability of cargo movement, the approach to analyse this topic should cover technological, operational and physical aspects. In order to get an idea of the economies involved, let us take the iron ore movement in Goa as an example to see what figures are being dealt with on a yearly basis. In 2003-2004, around 30 million tons of iron ore was moved via barges on the Mandovi-Zuari-Cumbarjua system. The sheer size of the load throws light on the revenue that India made because of this. It is understandable that the reason for this venture happening is because of the abundant resource available and one might even question which are the other resources that are available in India that could generate such income. However, the point that is intended to be emphasised is that with the correct infrastructure it is not impossible to make better use of our inland waterways on a commercial perspective.
With this context in mind, it now becomes easier to see that the term cargo can be extended to a domestic use as well, namely transportation of commodities and lastly human cargo i.e. transport. The next section will cover the human element over a wider perspective.

As mentioned before, transportation by water is cheap, more effective in terms of load and better for the environment with comparison to air or land. In some cases, it may even be quicker.

2.2 Passenger movement

The same principles of cargo movement can apply to a human perspective as well. . An example of this can be taken from Mumbai where ferries are part of the public transportation system.

The details of such movement are given in the statistical summaries produced by IWAI, the ministry of shipping, state level authorities and the Planning Commission of India and on record the sale figures are impressive. The point to be emphasised here is that more use of such systems should come into the market to make the concept of water transport much more feasible to operate.

It does come to mind that implementation is difficult but with clear aims and proper planning, the outcomes of such projects are well within our reach.

Also easy transportation to different places can help tourism as well.

3. Limitations

Getting a project from paper to the real world is always difficult as the practical world is a very dynamic environment where factors change all the time and its effects on a particular result can be drastic. Plans should always be made for the worst case scenarios but limitations are inevitable. Here are some of the limitations that hinder the capitalisation of inland waterways:

- Availability of vessels and associated infrastructure is not currently present.
- Lack of public awareness and advertisement.
- Lack of funding.
- Shallow depth in many of waterways.
- Operation viabilities in terms of budgeting.
- Development can only be limited a point where the presence of dams don't effect operations.

4. Advantages of developing inland waterways

As it has been hinted before, there are a number of advantages of water transport; namely cheap cost, better load carrying capacities and relatively less pollution. Apart from these there are a number of other advantages as well:

- The development of inland waterways would adherently create more jobs; in a number of fields from building infrastructure, lochs, ports, terminals and maintenance yards to employing cleaning and municipal staff.
- Increase in economic forefront – the money remains in the Indian market.
- New exposure to channelling developments in an underdeveloped technical aspect.
- Provide an alternate means to road travel thus reducing congestion and smog.
- Increase in number of Indian owned barges, vessels and dredgers.

5. Approach to developing inland waterways – Dredging and water bridging

Dredging is the process of excavating the water bed to increase the depth of a water body. This massive task is done by specially built vessels known as dredgers. They come in two types - hydraulic and mechanical. Hydraulic dredgers are those that utilise a dredge pump to transfer the contents to its designated area. Mechanical dredgers are those that use some form of mechanical means to transport the material e.g. using grabs or bucket-ladder types.

Source-http://dc-corp.resource.bosch.com/media/general_use/industries_2/machinery_applications_and_engineering/dredging/marine_D_w496.jpg

Increasing the depth of a water body has the following effects:

- Larger draft vessels will be able to operate in these areas so operations can be increased. This will have an effect on the economical output.
- Easier navigation for vessels.

The dredged material itself has a lot of uses:

- Used in the industry to make ceramics.
- Silted soils from the riverbeds have proved to be quite fertile.
- Land reclamation projects can use this material.
- The material can be used to create artificial islands.

There are many types of dredgers available in the market today. Those that are pontoon based like the cutter suction dredgers have been proved to be useful in areas where there is moderately hard soil and low draft. Similarly trailing suction hopper dredgers have proved to be more useful for coastal applications.

The means of discharge from these dredgers can be in many types, namely;

- Pipelines
- Rain-bowing
- Barges (these can be a completely separate structure)

Water-bridging is the concept of interlinking two or more water bodies artificially. This will be used to create a web of connection. Though far fetched it is important to understand that ideas like this exist.

6. Conclusion

In this paper, the topic of the economical viabilities of India's inland waterways was discussed. First the geographical importance was stressed before moving onto the commercial aspect. This was strictly concerned with only two subjects – passenger/human movement and cargo movement.

Despite having a number of limitations in the real world, the second half of the paper gives an approach to solving the problem i.e. through dredging and water bridging. In order to convince our points, a number of advantages of developing inland waters were also made.

In short, the development of inland waterways would definitely have a huge impact on India's economy apart from providing jobs to people in the thousands. Also, the concern for environment pollution would be lessened using water transport.

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