

# Padma Bridge- An opportunity for local construction industry

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Dr. Munaz Ahmed Noor, Editor, Beyond Building and Professor, Civil Engineering Department, BUET; Moderator of the session

First, we want to thank the government for taking the decision of building Padma Bridge using our local capabilities. We hope the construction will be completed by 2019. It will increase our current GDP by 1.2%.

The Padma Bridge project has eleven components. Significant improvements have been achieved in all the eleven components. Today, we are here to discuss about the building materials of the bridge and capabilities of our local companies to support these material requirements. Indeed, our local companies have capabilities. For Bangabandhu Bridge, we had to import a large share of raw materials. But, now, our local companies have the capacity to provide a big share of raw materials for any mega construction projects. They have provided raw materials for many big projects like Gulistan, Jatrabari and Kuril flyovers, Hatirjhil-Begunbari project, etc.

The installed capacity of our steel factories is about 7 million tonnes per year. Of these we use around 4 million tonnes. The producers maintain high quality of the steel. We want to know from our speakers whether we can use the surplus production capacity of our local industries for providing steel to the Padma Bridge project. Similarly, installed capacity of our cement factories is about 30 million tonnes per year of which we use only 18 million tonnes. So here we have also capacity to produce adequate amount of cements for the Padma Bridge project.

We also need huge amount of aggregate materials for road pavement, concrete deck and other activities. So we want to know whether we have enough capacity in those regards. There are also environmental issues regarding construction of the bridge. In today's discussion, we will discuss these issues and find ways to improve the capacity of our local industries so that in the future Bangladesh becomes self-reliant in constructing mega construction projects.

**Professor M Shamim Z. Bosunia, Chairman & MD, Abode of Consultants Ltd. and President of The Institution of Engineers, Bangladesh (IEB)**

For the construction project we need three types of steel materials. Two of these are reinforcing steel and structural steel. In Bangladesh, we do not have large scale industries for structural steel. We are importing the whole amount of structural steel from China. It is 50 grade steel. We have adequate capacity for providing reinforcing steel. We can also provide good quality cement. Our local cement producers can compete with any company from any country. For Padma Bridge, we will procure the whole amount of cement from local producers.

Many people are still skeptical about the future of Padma Bridge. I want to assure them that the government has already started the project and paid more than 6000 crore taka to the contractors.

Another important construction material is stone. In Bangladesh, we have stone in Bholaganj and Maddhpara. Bholaganj's stone does not match the requirement of Padma Bridge. But Moddhopara's stone can be used. It meets the standard. We will give the contract of supplying stone to our local contractors.

Another important material is sand and the total amount of sand will be procured from local sources. Its fineness has to be minimum 2.5.

**Dr. Engr. Gholam Mostafa, Chairman, Civil Engineering Divisional Committee, The Institution of Engineers, Bangladesh (IEB)**

We had to opt for truss bridge to complete the Padma Bridge within 2013. That's why the government has to incur a huge amount of extra cost. And we missed the opportunity of doing it as an extradosed bridge. It would have significantly lowered our cost and created an opportunity for our local steel mills because this type of bridge can be done completely by using reinforcing steels. We have adequate capacity to provide that amount of reinforcing steel. So we have lost a great opportunity. Now, we have to ensure that the Chinese construction company uses our reinforcing steels and cements.

**Dr. Md. Shafiqul Bari, Professor, Civil Engineering Department, BUET**

We have developed a lot in steel structure. As an industry, we have improved a lot in the field. Construction has become an industry. Padma Bridge project is a big opportunity for us to improve qualitatively and quantitatively. Big projects expedite industrialization process. We have to explore our local sources for providing raw materials for these projects.

**Dr. Md. Mizanur Rahman, Professor, Civil Engineering Department, BUET**

If we estimate the amount of concrete for building Padma Bridge, we will need approximately 1.3 million cubic metre concrete. If we talk about quality of concrete we have to consider qualities of all the ingredients of concrete. Our local industries will be able to supply necessary amount of reinforcement of steel and cement. We can get stone chips from Maddhpara. But to get a huge amount of stone chips from there we need to place demand having a good amount of time in hand. I do not know whether the demand has been placed or not. If we want to import stone chips from abroad we have to ensure continuous supply otherwise interrupted supply will severely hamper the construction process.

For ready mix concrete we have to establish plant at the site. It will reduce the problem of transportation. Another important issue is ensuring quality of ready mix. To ensure that experts should be at the plant.

**Engr. Md. Abdus Sabur, Vice President, IEB**

I think importing stone chips will be cost effective than procuring it from Maddhpara. Still, I will ask our experts to explore our local sources of stone chips. Another issue is taking care of shrinkage of cement.

Our local contractors are doing the river training work. They are doing a very good job. But the presence of Mika is an important issue to be considered. It is a major reason behind vulnerability of the structure.

**Engr. Mohammad Zakir Hossain, PEng., Secretary, Civil Engineering Divisional Committee, IEB**

Recently, the Bhutanese ambassador to Bangladesh has shown interest to supply stone chips for Padma Bridge. Previously they supplied stone chips for Bangabandhu Bridge. We can easily tap their source. It is a good offer.

IEB organizes various seminars and training sessions for enhancing the skills of our engineers. From March 27-

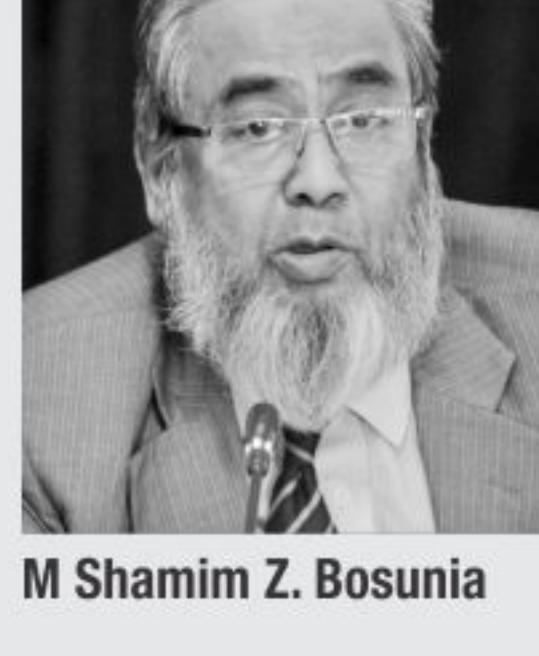


Recently, MOHSTEEL Limited organized a roundtable on "Padma Bridge-An opportunity for local construction industry". Here we publish a summary of the discussion -Editor

## PARTICIPANTS



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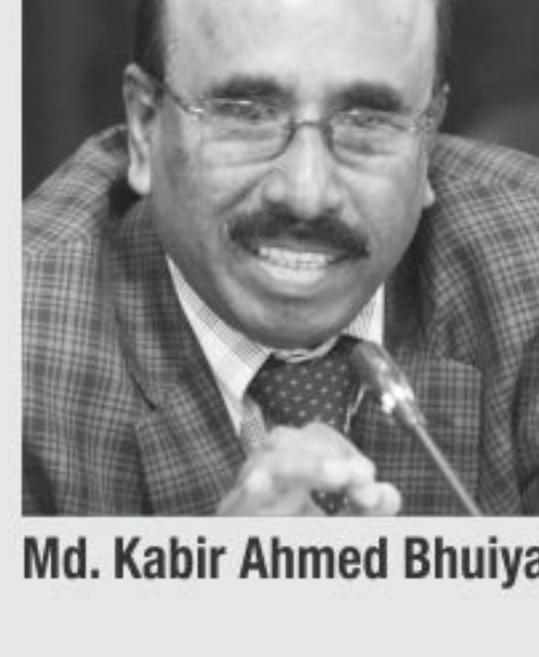
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Prof. Dr. A.M.M. Saifiullah



Maruf Mohsin

28, executive committee's meeting of Asian Civil Engineering Society will be held in Bangladesh. Top class engineers across the world will be present in the meeting. There we will try to organize seminars on our local bridge construction projects so that we can get their reflections on these projects. We will invite all of our engineers to attend the seminars as well.

**Mohammed Mohsin, Chairman, MOHSTEEL LTD.** I am glad to see the feeling of our engineers for our local industries. Without such feeling and support local industries cannot be developed.

I think canceling of World Bank's fund for Padma Bridge is a blessing in disguise. Today, we are here to create awareness about the capacity of local industries in doing mega constructions.

**Engr. Abdullah Al Mamun, MARC Ar. & Eng. Ltd** Our production growth of cement and steel is lower than the growth of the consumption of these materials. For example if we take data of 2010, we see our consumption of cement grew 31% but our capacity grew only 14%. For steel, we see our per capita consumption is only 26 kg whereas India's consumption is 56 kg and the world average is 217 kg. So we have a huge opportunity to develop in these industries.

After Padma Bridge we have more plans for building other bridges. In designing those bridges we should consider the interest of our local industries. It will be a great boon for our local industries.

**Engr. Md. Kabir Ahmed Bhuiyan, Chief Engineer, Public Works Department** I think we need proper supervision for procurement of raw materials. We should also look after production process of our local raw materials.

We do not need unnecessary loan and aid for construction works. In Bangladesh our civil engineers have enough capacity to stand on their own. We should give them more training and more opportunity.

**Dr. Mafizur Rahman, Professor, Civil Engineering Department, BUET** I think this is a big opportunity for creating efficient middle and younger manpower in our country. So we have to emphasize on this aspect. We have given them

hands-on training through these mega projects.

A large amount of raw materials will have to be transported to the construction site. The construction site is situated in a rural area. So there is risk of irreversible environmental damage to the bio-diversity of the area. We have to be very careful about this damage. We should strictly monitor it and take adequate mitigation measures to minimize. There is also the issue of noise pollution. It severely affects bio-diversity. We should use noise barrier to reduce this impact. In the capital, we see height of flyover create noise pollution in a large adjacent area. This is really harmful for human health. We should take these issues into consideration in building the bridge.

**Syed Azizul Haq, Additional Chief Engineer, Public Works Department (PWD)**

Brick and earth clay are two important raw materials in construction. These come from the fertile part of soil which is very important for our agriculture. We have to consider this loss. There are many alternatives to these materials. We should explore those alternatives and try to use limited amount of brick and earth clay.

Another important element is lead painting. It has harmful impacts on environment and human health. So we have to be careful about it.

In the construction project we will need a huge amount of water. We have a bad trend of building deep tube well for mitigating water requirements of construction project. It has harmful environmental impacts. I will suggest the use surface water of the rivers. Even we can establish a water treatment plant to purify it.

Sand dredging is another issue. We should do it carefully. Unplanned sand dredging around the Padma Bridge areas will threaten the bridge itself.

All cements must be carried in covered vans. We can use water transport facilities for transporting cement and other raw materials.

We see sudden increase of industries during any mega construction projects. Increase of industry is good but it should be regulated so that they maintain environmental standards. We often see that after completion of big projects many of these new industries remain idle or sometimes get closed. I will urge our existing industries why not they upgrade their existing capacity to meet the extra demand of industry. It will be helpful for our environment.

We see unplanned and concentrated industrialization

in our country which has really harmful impact on the country. That's why we need a national infrastructure planning authority which will make the plans for industrialization all around the country.

**Engr. Md. Anwar Hossain, PEng., Former Additional Chief Engineer, PWD**

There should be an environmental management plan in the construction project. If it is not already there then we have to prepare it immediately and implement simultaneously with the construction project.

From the presentation of the speakers we have come to know that there is no pre-study whether our existing source will be able to provide adequate amount of materials for the project. In the future we should do this type of study before embarking on any mega construction project.

**Dr. Moazzem Hossain, Professor, Civil Engineering Department, BUET**

I think there is a gap between professionals and business group and decision makers, particularly politicians. Construction of Padma Bridge fell into uncertainty because of this gap. Today's discussion is very important for bridging this gap. I must thank the government because of their brave decision to build the bridge with local financing mechanism.

Today, oil price has gone down to half. We should exploit this opportunity and go for massive expansion of construction works. For example, we should immediately start planning for second Padma Bridge at Paturia.

Government should have a cell to coordinate among technology and business development. We are doing such a big project from where we can take aside some money and invest in R&D. We have to groom our contractors. We have to explore our local opportunities. If the contractors need new technology the government will support them. After completion of the project, the technology will remain in the country and we can use it for another project.

**Prof. Dr. A. M. M. Saifiullah, VC, Ahsanullah University of Science and Technology**

Previously we constructed Jamuna Bridge which is the 100m span bridge. Now we are constructing another big bridge project. Like Jamuna Bridge, there are also some challenges in this project.

Our soil is completely different from the soils that we read about in text books. It contains mica that's why it's soil quality is different where even excavation can cause liquefaction. So this is a challenge that we have to work on with such soil. And the major problem in sandy soil is that we can never collect an undisturbed sample. And without that how can we get to know the property of in situ soil. This is another challenge. We will not get its solution in any text book. The chart which we use for constructing foundation on sandy soil was made for Mississippi river which is totally different from our sand. So we have to develop our own technology for our specific conditions. We have many research scopes here but we do not spend any money for that. We do not have coordination in design.

Fortunately, we have a very good consultant for Padma Bridge. He is an authority on soil liquefaction. With his help we are doing some experiments here. We have collected undisturbed sand sample from very deep. We used a particular method for collecting sample of soil which we have sent to Japan.

It is not that we should not hire foreign experts. We have to do that for particular purpose. But the decision will be given by our experts. And we need more research for that.

Assessment of pile capacity is not yet complete. When we drive a pile we have to know the capacity of the soil. That's why we have given a clause in the tender that the company has to do some model test for finding the best piling system through various experiments. The best one will be used in piling.

A great shortcoming in building any foundation is that we have a building code but do not follow it. Even in the building code, we have not mentioned how to do the soil test. We do not have a code for foundation exploration which is followed in other South Asian countries. So we need regulating bodies for monitoring these regulations.

For river training we will follow the same method which we followed in Jamuna Bridge.

**Maruf Mohsin, Managing Director, MOHSTEEL LTD.** How a company stays in the market is very important. MOHSTEEL LTD. is run by process engineering. We always give top priority to R&D. We need to maintain lean efficiency so that industry can survive and invest in R&D.

We have exhausted Dhaka. Now we have to look out of Dhaka. We should also emphasise on the North. There is an EPZ there. It is almost neglected. We should explore opportunities there.

Sometimes local companies face problem due to delay in money transaction. Because we clear money for foreign companies but local companies have to hanker for their due payments.

In the US, there is a division of civil engineers who look after highway engineering. They use noise barricade to protect road-side inhabitants from sound pollution. They use LED light so that the light is focused and does not disturb environment.

We are losing our talent pool. Our engineers are employed in various firms abroad. We have to attract them so that they can work for the country. We need foreign experts, but we have to tell them you help us to build but don't build it for us.

**Dr. Munaz Ahmed Noor, Moderator of the session**

From today's discussion, we have come to know that Bangladesh has gone a long way in constructing mega projects since Bangabandhu Bridge construction. Now we are capable of providing adequate amount of cement and steel and, to some extent, aggregate for mega construction projects. But we are still in lack of producing structural steel plate for bridge though we are capable of doing it for building construction. I think, if we do more and more bridges we will also achieve that capacity. One of our entrepreneurs has said that his company will increase capacity in this regard if it sees viability and profitability in that endeavour. IEB and engineering universities can also play a big role in increasing our capacity and efficiency. I think IEB should arrange more and more seminars and training sessions for grooming our engineers with latest technologies. R&D is another important area to be considered. We should allocate adequate for this purpose.

Padma Bridge will be a big boost for our economy. It is our pride and dream. We want to thank our Hon'ble Prime Minister for her bold initiative. We hope Bangladesh will strive forward building more and more mega constructions.