

INTERVIEW WITH PROFESSOR AINUN NISHAT

*There is little need to introduce Dr. Ainun Nishat. His name holds within it a lot in diverse fields from teaching to practical engineering application, from research to training. He has been one of the best known among the BUET teachers, a visionary in the engineering profession, contributed a great deal to the water related issues of Bangladesh and is now the leading professional and researcher in environmental field, working with The World Conservation Union (IUCN). On behalf of the Civil & Environmental Engineering Department of the UAP, **Navid Bin Saleh**¹ managed to sneak through Dr. Nishat's busy schedule and had a delightful interview with him.*

Personal

Sir, you were one of the great teachers of BUET. How do you feel switching from teaching profession to a research one?

Dr. Nishat: I have been in teaching for a long time, almost for three decades. Research was also a part of the teaching though, mainly supervising thesis of the students in BUET. As a teacher my responsibility was to guide the students into the path of self-actualization and development but the student was fully responsible for the core job of the research. Now I am fully engaged in research leaving behind the teaching. There is a difference between the researches that I am doing now with those that I supervised. The current research works have time-restraints. The person or organization that is investing money into the work fixes a deadline whereas student research of BUET never was asked to meet a deadline. Teachers did not care whether the student is finishing his research, post-graduate (M.Sc.) research in two, three or even five years and it was surprising if a student had finished his research within time. Research work gained impetus only if the student was set to leave for higher studies or the supervisor himself was leaving for attending a conference abroad. Concern about the deadline is the biggest difference between the two research environments. I am still working with some teachers and I do remind them time and again that time is limited.

I really miss the passion and infatuation that I had in teaching. However a few private universities still ask me to give lectures. I have been involved in Continued Education for a long time now, with PATC, NAEM; the institutions that trains the teachers. Army Staff College, National Defense College, Planning Academy are few others where I take classes whenever I can manage time. I had given lectures as a guest faculty even in mathematics, political science and international relations departments of Dhaka University. But the approach of teaching in these institutions is totally different from what we find in a conventional classroom.

I have been to BUET as well being the resource person in a few workshops on environment that had been arranged by Civil or Chemical Engineering department of BUET.

Can you please share with us some of your memorable teaching experiences?

Dr. Nishat: I have been involved in a number of institutions as a teacher or a trainer or a resource person as I have told you earlier and that's why have a lot of memories in teaching. Yesterday I went to a fair that was arranged to celebrate the World Environment Day. I met a lot of my students there and in most cases I could not recognize them but they did. This is probably the greatest achievement for any teacher and I am used to getting it quite often. As I had been involved with BUET not only as a teacher but also in many other ways that is why my students are from a wide circle. Students still ask me why I left BUET.

Environmental Issues

What are the environmental issues that you feel are of utmost importance?

Dr. Nishat: It is difficult to identify but the most important factor behind it is to internalize the environmental factors in the development process, which has been said but not done in practice. If you look into our water policy, land policy, forest policy, trade policy, fisheries policy you will find that all of these talk about sustainable development, preservation of the environment and ecology. However, the actions of the institutions that are responsible for the implementation of the policies are not reflecting this environmental issue. We perform Environmental Impact Assessment (EIA) during the setting up of an industry but we are not planning the waste disposal of that plant. Therefore, unless the environmental issues are integrated into the development process and day-to-day life of people, the problems regarding our ecology will persist. I feel that the main concern is to give proper recognition to the environmental problems. We all have to realize that we will be affected for some of our actions and our future generation will be more so, only then we will look to move towards sustainable development. This should be the principal approach. To blemish two-stroke engines or to tarnish polythene or ban Hazaribagh Tannery or even stop arsenic intrusions are all programs but the main aspect; i.e. the strategy or the policy is missing.

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Sir, you are giving importance on the strategy. Do you feel that administration which formulated the policy need to be conscious of the issues or the people who are subjected to the policies should play the key role?

Dr. Nishat: What I mean by strategy is that the ministries, organizations that are performing the regulatory functions and those which are planning should take the leading role. Take tourism for example. It has been developed in private sector all around the world and public sector has the responsibility to play the monitoring role. Tourism is closely related to biodiversity, eco-tourism. How people are traveling, the means of transport they are availing, whom the tourists are obstructing or hindering; these are the issues to be monitored. But all the stakeholders of the system must internalize that strategy to make it work. I am really not too sure whether the use of polythene has been totally stopped or not. We still do find it in some form in the market. Plastic shopping bags different from the conventional ones are gradually taking over again. The reason behind it is that the producers are still acting against this ban. Producers also have to come under the same banner. That means the whole system must work together in the same strategy. It is imperative to incorporate the person who is sanctioning a project, environmental organizations that are monitoring the producers and also the consumers.

We would like you to discuss on FAP, state of Buriganga, Arsenic problems, Ganges treaty and other related environmental issues so that the students get an idea on all these very important engineering aspects that have immense social impact.

Dr. Nishat: FAP needs to be addressed with a background. Water planning started in 1982-83 in our country. Till then the National Water Plan had food sufficiency as its objective. The motto of the plan was that control and supply of water would be used for food production. During 1988 after the 87-88 flood, Master Plan Organization (MPO) was preparing National Water Plan. Then it was said that flood as an issue was not addressed with the gravity that it should have been by MPO. Flood needs to be addressed with care as a country suffers immense economic losses in the subsequent years of the year of flooding. That is why flood policies were prepared at that time to take care of the immense damage of the national economy due to the occurrence of a flood. It was recommended then that for flood management and mitigation an integrated master plan is to be prepared which will incorporate both structural and non-structural measures. FAP was made at that time. But the main debate is with its name. Although it was named Flood Action Plan, there was no action in it and neither was it a plan. It was rather a preparation to make a flood plan. When WARPO prepared the report in '91,

working for two years from '89 then it was realized that the report was not an effective one. FAP was then modified saying that it will not work only with flood but with the overall water management system of the country. After the completion of the project in 1995, FAP lost its name and was turned into a preparation for making the Integrated Water Resource Management Plan. There has been a lot of debate on this whole issue of FAP and subsequent plans. There was a huge influx of money in the project and Bangladesh had no control in the spending of those aids. The reason of this is probably known to all and that is in case of aids the donor country controls the flow of money, not the country that receives it. World Bank, Asian Development Bank (ADB), Germany, France, Holland, USA, Canada donated the money jointly and therefore the integration was not too good.

Arsenic is the new emerging issue. Arsenic intrudes into water due to natural reasons. At one time we felt that drinking water problem had to be solved to control diarrheal diseases. The local people were advised to drink tube well water instead of pond or well water. We assumed that tube wells are free from pollution but in reality tube wells are only free from ecolites, bacterias. But we did not bother to test for the chemicals that exist in the tube well water in soluble form except for Iodine and Nitrites. All other trace elements were not tested. Firstly, people are now in a dilemma as they have once been told to drink tube well water, which was assumed to be safe and on the contrary now are being told that it is risky to drink water from tube wells after finding trace of arsenic in some of these. Secondly, identification of tube wells having arsenic contaminated water. The field kits used to identify the tube wells have sensitivity to measure arsenic up to 0.1 mg/L whereas international standard is that arsenic should not be more than 0.01 mg/l. There is a definite discrepancy in identification. People have to be given alternatives to make them avoid drinking water from red marked tube wells. Pond waters may be an alternative source to be used if those are not polluted. Pond sand filter if used as slow sand filter or if the well is covered with a shed or if rainwater harvesting can be done to provide people with alternative sources. Treating of water for arsenic is of course the best solution and its prospect is deeply looked into. The mapping of the tube wells having arsenic contaminated water has not yet been completed. Everyday new tube wells are found which are marked red and marking the tube wells with red and green colors hasn't worked that well actually as people do not have reliability on colors. The bottom line is that solution for this problem is not too imminent.

Buriganga is dying in three ways. Firstly it is dying physically as the width of the river is ever decreasing along with dumping of wastes in the river, which reduces depth of the river. Nature of the river is that its cross-section is related to its flow and water stage is related to the sea level. If the bed is elevated then the

cross-section will change and if the cross-section changes then the flow will change accordingly. If such condition continues then after few years it will be found that no barge can reach the Badamtali Ghat and the river has totally lost its navigability. Secondly, the river is dying chemically as well. In the area from Hajaribagh to Sadarghat, the pollution of water is so intense that it should better be called a sewer than a river. You cannot even spend a minute in the Buriganga Bridge No. 2 due to extreme pungent smell from underlying water. Thirdly, Buriganga is dying biologically too. We know that if dissolved oxygen is below 4 mg/L then the aquatic flora and fauna cannot live there. Buriganga has dissolved oxygen 0-2 mg/L and the whole aquatic life is destroyed. Buriganga has a few legal problems as well. People residing on the banks are very influential and as the land value is pretty high, disputes continue to ransack the bank sides. Another issue is that riversides are attractive for recreation and most of the countries in the world have recreational facilities by the riverside. Bangladesh once had the Buckland Embankment and now it is damaged though. There is another issue of defining the river as our rivers change their cross-section from winter to the rainy season. Given all these I feel that Buriganga should be saved for Dhaka city as the city is extremely dependent on the river.

Ganges is a common river for both India and Bangladesh and therefore both the countries need an understanding regarding water sharing of the river. The understanding should have existed for a longer period than it now exists. The first understanding was of 41 days, which was followed by another one for a 5 year period, then there was a gap and another treaty for one and a half year followed the gap and then again for 3 years there was another one made. This kind of an ad-hoc solution made the water management of the country more difficult to control. From that perspective the recent treaty is definitely a huge success. A point to be noted here is that when such agreements are made. When two parties are not willing to agree on an issue then such negotiations become necessary. If there were plenty of water available then there would not be any agreement necessary. Another important issue is that the Ganges water that we are sharing in Farakkah is not the whole share of water. Huge amount of water is withdrawn in the upstream. International water management concentrates on current need not on future potential needs. The water management throughout this period shows that India withdrew large amount of water and used them but Bangladesh did not use the water that is received except in case of environmental management. It means that the current need for water for Bangladesh is less. This reality has really placed Bangladesh in an awkward situation. But I feel that the previous treaties had a few limitations. The 1977 treaty had the Guaranty Clause as its strong point but the biggest drawback it had is that it was integrated to augmentation, related to the link canal. But the recent treaty does not have this integration. I also feel that a

treaty should be treated according to its own merits and should not be compared to other treaties.

There was a large hue and cry a few days ago that arsenic is intruding into our food chain. What is your opinion about that?

Dr. Nishat: Regarding the intrusion of arsenic in the food chain FAO and other bodies have said that when water molecules enter the root system of plants through osmosis process, arsenic is screened out, as arsenic bearing water molecules are heavier. However, an Australian scientist and Professor Imanul Huq of Dhaka University showed recently that arsenic do enter the root system and get accumulated in the terminal points of leaves and other parts of a tree. Leaves of those plants that we eat may bear arsenic if irrigated by arsenic borne water but the big question that whether paddy is intruded by arsenic is still to be answered. At first it was stated though that arsenic accumulates in hay but not in rice, however the Japanese are now claiming that arsenic does accumulate in rice as well. Arsenic has two forms, organic and inorganic one of which is harmful and the other is not. Again, there is no international standard giving the amount of arsenic accumulated in food grains that will be harmful for human intake. This problem is very new and there is no standard what so ever stating the tolerance of arsenic in food. We see that if drinking water contains water arsenic in excess of 0.05 mg/L then people get affected after drinking such water for 10 to 12 years. But the corresponding amount of arsenic in food or the duration they are consumed to cause similar effect isn't yet determined. In case of food both inorganic and organic content of arsenic is to be measured. If the arsenic intruded is inorganic then it will eventually be removed from the body. Research on the whole issue of arsenic intrusion in food chain has now just started. I would say that people should not indulge into scare mongering. But if it is known that the food produced is irrigated by arsenic borne water then it is safe to avoid it. The issue is still very new and it needs detailed research to provide transparency in the issue.

Sir, I always wanted to know your opinion on two issues. A few years ago I read an issue of the Time that if there is a Third World War it would be for water and the other issue focused on patenting indigenous resources based on intellectual property rights. I would like to ask you that will there be a Water War in future and is there any future for Bangladesh in patenting indigenous herbs and thereby earning foreign exchange?

Dr. Nishat: Morris Strong came up with this dogma of Water War in 1992. This war for water crisis is not a mere statement but is very real. Pakistan has political conflict with India for long time but the conflict that Pakistan has within itself between states is not negligible. The conflict of Punjab with Baluchistan or the conflict of Sindh with Punjab for water sharing is

intense. India also has this conflict for water share between its states for a long time now. Israel-Palestine conflict got impetus by the water sharing of Jordan River, which was settled later on. So the crisis for water is very real and it exists worldwide. We need to address this very carefully. Crisis for water is created from water use. We can measure water that we use for irrigation or daily livelihood like washing, bathing and so on. But can we measure the amount of water that we eat in excess of drinking? You understand that the amount of water we need is enormous. The only way to address this potential threat of breakout of war is to be aware in using water and reduce its wastage as much as we can.

Intellectual property rights is a new concept that says if a community has some natural resource that is indigenous to its area then the community has a legal right to patent that resource. If a multinational company wants to use that resource it must pay sufficient price to get the legal right of using that resource. Recently Pfizer has started a research with an African herb and is going to invent a new medicine using that herb. Through extensive research Pfizer discovered that an African tribe eats an herb before it starts its caravan across Kalahari Desert. The herb helps to melt the fat in the bodies of the tribal people and they do not need to eat anything during their journey. The fat that melts due to the effect of that herb supplies energy needed by their bodies. This remarkable discovery made Pfizer interested in that herb and they will marketize the new drug saying that it will reduce obesity through melting stored fat in human body. Under intellectual property rights Pfizer cannot use this indigenous herb without paying price to the African tribe and Pfizer is ready to pay for it. Now the question remains that whether Bangladesh can patent a few herbs and earn money from that? Yes Bangladesh can. But for doing that the herbs must be found and enlisted and proved to be indigenous to our land. India can easily do that as all state forest departments in India has list of the herbs found in that area along with the species. Bangladesh produces a number of herbs that has healing qualities (Hortoki, Amloki, Neem, Chirota, etc.) but there is no effort to have research on those and proving that those are really indigenous.

How do you see the state of environment that will exist in Bangladesh in the coming decade?

Dr. Nishat: We are extremely worried about two issues that will cause problems in the coming decade. One is over population, which has resulted into urbanization. Say our population is currently 130 million of which 25 million lives in the urban areas and rest is rural population. By 2025-2030 the population say will increase to 180 million of which 100 million will stay in the urban areas and rural population will decrease from 105 million to 80 million. The obvious question comes up that if the urban population is quadrupled then will the cities be

prepared to take the load of such huge increase in population? The answer is 'NO'. Urbanization process has not yet started to accommodate these people and along with it rural population have not been given proper employment to stay back in their places. Migration is therefore ever increasing. This is one side of the problem and the other side is that the world climate will change in the next 10-20 years and it is forecast that the number of cyclones, earthquakes and floods will increase. Question is that are we prepared for these? Answer again is 'NO'. I think the elements that we will need to live in comfort and with safety will face a crisis in future Bangladesh.

IUCN Related Questions

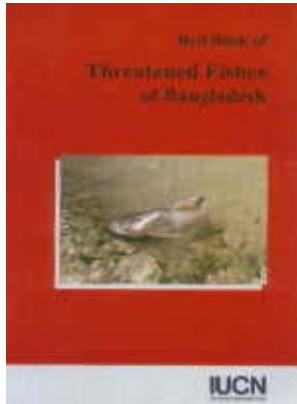
You have established the IUCN office in Bangladesh and have been working for it from its beginning. What environment related issues are there that IUCN addresses and what were the constraints that you faced in carrying out your job if any?

Dr. Nishat: IUCN mainly works on conservation of nature and proper use of natural resources; i.e., on the concept of sustainable use of resources. Man collects resources from nature. Water is a natural resource, water body is even a bigger resource because it indicates an ecosystem. Forest, coastal and marine zone are all natural resources. IUCN is working for a long time to analyze the nature in an ecosystem based approach. IUCN works in six sectors: 1. Endangered species - on some species that are under threat of extinction, 2. Protected area-some areas that should be preserved, 3. Ecosystem management, 4. Legal Issues - environmental law and conventional biodiversity etc., 5. Education and awareness, 6. Policy-intellectual property right to patent indigenous herbs. IUCN was a very small office when I first joined here and now I am working in these six areas. We can divide the environmental issues into two aspects: Green and Brown. Brown is the pollution aspect and IUCN deals with the green part; nature, nature conservation, biodiversity, ecosystem and so on.

The main difficulty that I faced is that the concept of nature conservation and integration of this concept with development process is not appreciated yet. Policy makers think that nature conservation impedes their development work. An owner of a tree feels that to fell his tree and selling the wood is more beneficiary and IUCN tries to convince them that to plant a tree and not felling one is more beneficial to the nation. The appreciation of IUCN's work is lacking and this is one of the major constraints with the perennial problem of funding. China, Pakistan or Nepal gets attention to manage funding for such work but in our country we do not receive much attention from the government, as you might have understood from my previous argument that environmental concerns are not too appreciated.

What are the achievements of IUCN so far?

Dr. Nishat: We have published a five volume red book on threatened mammals, amphibians, reptiles, fish and bird. The book also consists of a long list of all species of these animals that exist in our country.



Red Book of Threatened Fishes of Bangladesh

Edited by:

Mahmud-ul-Ameen, Md. Anwarul Islam and Dr. Ainun Nishat.

Bangladesh, IUCN – The World Conservation Union, 2000, xi, 116
ISBN 984-746-004-3.

We are working in the Hill Tracts with a small Mouja regarding the Marma tribe. We are looking after the resource management of the tribe and trying to improve it. The regional documents that are needed for this resource management were prepared in a conference held in Dhaka.

We are also analyzing the interaction of human with nature. We are considering seven villages as a case study and looking into the use of water throughout the year and by that trying to find out the correlation of human with nature.

We have another publication on the Sundarbans where we tried to explore the enormity of the Sundarbans as well as the diverse resources that it possesses.

We have also started to monitor Sundarbans' biodiversity. Trying to find the direction of change of the biodiversity, whether it is in the right direction or wrong.

We also work for the government in a way. When Bangladesh represents in any international conference on biodiversity or nature then we try to equip the personnel involved so that their participation can be more effective and fruitful. We feel that we are slowly getting to bring the government into the stream of nature conservation through internalization of environmental factors.

Questions About Engineering Professionals

How would you differentiate the profession of teaching with that of a professional?

Dr. Nishat: The two professions though separate but should have correlation between them. A professional can practice in field throughout his life but a teacher in Engineering profession should be devoid of practical experience I don't believe so. Engineering is an applied science and must have close relation with reality and practice.

In BUET, students of Civil engineering hardly are taken to visit engineering constructions and structures. Few fortunate batches might have the opportunity to visit Jamuna Bridge or Ketchup Bridge or Test Barrage. Overall, the education that is given to the BUET civil engineers is really not close to the practicing world. I can give you a few examples of some personalities who have really made a difference in the real life of the nation. Professor Jamilur Reza Chowdhury is one of the big names in IT being a civil engineer and pushed the country quite far in the IT field. Professor Iqbal Mahmud in 1983-84 did a research on import substitution, component substitution; i.e., how an industry can diversify its products. It is not necessary that an industry will only produce bulks but it can also work as a backward linkage to its own finished product; for example, buttons and fabric can be backward linkages to a garment industry. Professor Shamim Z. Bosunia is a professional as well as a teacher, same attribute goes for Professor Azadur Rahman. Engineers should gain knowledge from these teachers who have first hand professional experience.

What are the qualities that you feel are lacking amongst the practicing engineers?

Dr. Nishat: Engineers in Bangladesh are taught to be professionals and almost devoid of knowledge in social sciences. In almost all the institutions in the USA, undergraduate engineering programs are so designed where 30%-35% courses are on social sciences, 30%-35% are on basic sciences and rest on engineering. Probably that is the reason why a number of doctors in the USA had their undergraduate done in civil engineering. The lack of interest of the engineering students in the social sciences subjects

and lack of attention from the administration to these essential courses is making our engineers more and more away from the reality. Besides, engineers are very poor in expression. They are probably good in calculations but not in expressing themselves and analyzing a problem in practical life excluding the exceptions. Engineers should be trained to be citizens of the society with adequate expression abilities.

What are the job prospects in Bangladesh for the Engineers?

Dr. Nishat: Civil engineering is basically an engineering degree. As I have mentioned earlier that almost 10% doctors in the USA were civil engineers. So civil engineers need not to be in construction job only. If a student graduating from physics can be a bank manager, if someone graduating from architecture can be a police officer then why not civil engineers? The graduate will use the approach he has learnt from his undergraduate years in his profession. Famous economist Adam Smith was a civil engineer, 50% economists in France are civil engineers and the problem in our country lies in the thinking process that civil engineers cannot do any other job.

Don't you think that recruiters in our country also won't give a job to a civil engineering graduate other than civil engineering?

Dr. Nishat: You are right probably. The recruiters cannot be solely blamed. The engineering graduates are not being trained to have other aptitudes. I myself employed a civil engineer here in IUCN. The person left this job in his first opportunity and joined in a job concerning earth cutting. The students themselves are not interested in other jobs. I feel that this narrow idea should be altered and the sooner the better. Therefore job prospect in traditional engineering is limited and related to development. As soon as construction work will increase job prospect for civil engineers will look brighter. This is a question of supply and demand.

It is almost a common notion among the passing out HSC students that they want to pursue their career in either Computer Science or Business Administration. Why it is so?

Dr. Nishat: It is because of a safe ensured job market. Students know that if one does BBA or complete a computer science undergraduate then he has a safe future probably not so safe if he passes out from civil engineering or sociology or economics.

Opinion on Private Universities

What is your opinion about the private universities in respect to the academics and others?

Dr. Nishat: The only regret is that the private universities could have designed the courses more

dynamically than they are doing now. The reason may be that they are made to follow the curriculum of either Dhaka University or BUET. They are not able to reflect the market demand in their curriculum. They are trying to be a little more innovative in making their students more expressive but still they are not interested in teaching social sciences in engineering programs. They are saying that they are following North American system however I feel that they are only following the grading system of North America and not their curricula. The reason probably is that they have to get their curricula approved by the University Grants Commission (UGC), which invariably includes BUET and Dhaka University teachers. The private universities are therefore becoming commercial institutions in pattern of the public universities. In the USA if you look into the syllabus of MIT or Carnegie Mellon you will find those are different from the state universities. Private universities there are continually experimenting to attract better students so that their market demand is kept high. A student needs to pay more to study in MIT than in a state university and obviously MIT needs to build him up in such a way that his market value is higher. New subjects are never designed by a state university, rather those are always by private universities. If the private universities in Bangladesh do not have some kind of a mechanism so that they do not need to mimic or imitate the public universities, I do not see any difference between the private and the public universities. Only difference may be that public universities do not have control over their teachers but the private universities have through teacher evaluation and someone is monitoring the teachers. The students in the private universities have the eagerness to learn and I am afraid it is nonexistent in the public universities. Teachers in private universities have the drive to contribute more to their teaching so that their evaluation is better and students here also have the eagerness as they are paying for their education.