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"The views expressed in the articles are that of the author her/himself and not that of the Bangladesh Academy of Sciences".

How to Sustain our Graduation to Developing Status and On-road to Prosperity§

§Dedicated to the loving memories of Prof. Dr. A K M Siddiq, Prof. Dr. Muhtasham Hussain, Prof. Dr. S. Z. Haider, National Prof. Dr. M. R Khan, Prof. Dr. Aminul Islam, Emeritus Prof. Dr. Jamal Nazrul Islam, Prof. Dr. Q. A. Fattah, National Prof. Dr. Jamilur Reza Choudhury, Prof. Dr. Naiyyum Chowdury and Prof. Dr M. Ali Asgar, the Honourable BAS Fellows for their great contributions.

1. Bangabandhu as a Man

An excerpt from the unfinished Biography of Bangabandhu goes as: "As a man, what concerns mankind concerns me and as a Bangalee, I am deeply involved in all that concerns Bangalees. This abiding involvement is born of nourished by love, enduring love, which gives me meaning to my politics and to my very living."

2. Civilization, Science, Technology and Engineering

There would be no difference between man and animal without philosophy comprising logic and reason. Nor would there have been emergence of civilizations and occurrence of inventions/ discoveries possible without philosophy. For this reason the research degree of all subjects is termed as ÔDoctor of PhilosophyÕ (Ph.D.). Science is a derived knowledge from observation and logic with free-mind. Hence knowledge, which can explain the occurrence of an event, is science. The trinity of free mind, religion and science can offer a balanced growth of science. Technology and Engineering are complementary and supplementary with Science as the root and Engineering providing the ultimate service to mankind. Engineering implements the technologies and is concerned with the construction of structures, production of appliances and maintenance. This is followed by an effective marketing policy to boost the economy of a country leading to prosperity.

3. Free Mind for Secularism, Patriotism and Mutual Respect

Synergy of religion, literature and science provides the persons practicing them properly, with free minds having adequate human qualities of logic, reason and comprehension. These ingredients are also referred to in the 2010 National Education Policy of Bangladesh. Here religion of human refers to a particular form of truth in the person holding it, valid even for an atheist. It may be mentioned that Buddhism does not have any reference to God.

Free mind with profundity in human qualities awakens creativity, humanism, secularism and patriotism. Persons imbued with such attainments, bear ability to roam across different tiers of topics freely to mitigate tiredness due to monotony resulting from a long stay in a particular topic. Humanism means speaking fearlessly for the downtrodden common mass. Patriotism brings in fearlessness to respect the Trinity of Mothers: Mother-tongue, Mother-land comprising country including the common mass and child-bearing Mothers providing continuity in the human race.

Sir Isaac Newton (1643-1727), number one renowned Polymath (having knowledge in multi-dimensional topics) Scientist and a devout Christian, was humble to say, "I have been only like a boy playing on the seashore.... in finding a smoother pebble or prettier shell than ordinary, while the great ocean of truth lays all undiscovered before me. " Nobel Laureate Albert Einstein (1879-1955) was religious. He claimed, "Science without religion is lame and religion without science is blind". He also categorically mentioned that the language of God can be understood through unfolding the integrity of His creation". Nobel Laureate Rabindranath Tagore (1861-1941) who was an Indian polymath as a renowned poet, writer, playwright, composer, philosopher, novelist, social reformer and painter. Sentiment of Kabiguru Rabindranath Tagore regarding Truth is expressed clearly in his poem on the Chariot festival of Hindus where the devotees behave in such

a way that "the path ponders itself as God, so does the chariot, the idol thinks itself the same and the creator gets amused". With his secular mind, Kabiguru was great in understanding sciences as reflected in his conversation with Einstein on the 'absolute truth' in 1930. In reply to the realization of Einstein that "the super-human quality, the absolute truth, cannot be explained by science and can be perceived by mind only," Kabiguru asserted, "Matters in the universe are made out of electrical forces as perceived by human's scientific mind. Truth is meaningful only when it is human. The absolute truth of mind, according to the Indian Philosophy, is embedded in Brahman representing the infinity". Einstein conceded by saying, "I am more religious than you". Brahman may be ascribed to the singularity with infinite energy at a point in the modern Big Bang theory. With his noble patriotic feeling, Kabiguru as a mark of protest to the misrule of British-Raj in India relinquished the British Knighthood.

The secular ideal of Kabiguru led him to encourage his son Rathindranath Tagore to be trained in modern agriculture and to adopt the business management system as can be seen in his introduction of the Cooperative Farming and Cooperative Banking. Kabiguru was a great philanthropist in caring very much for the welfare of his subjects, his country and contributed his wealth entirely for the common mass. Kabigurus's intimate friend Sir Jagadish Chandra Bose (1858-1937), a pioneering Polymath Scientist who is famous for discoveries of Microwave used in all Internet Communication Technologies (ICT) including radar, ground communication including cellular and smart phones, long-range communications including satellite, weather mapping, remote sensing, navigation and telescopes; detector for Radio Waves, living behavior of Plants and Crescograph in Plant Science. Like Tagore, he was also greatly secular and his discoveries earned him M.A. from Cambridge University and D.Sc degree from London University without examinations. 'Bose crater' on the moon's surface has been named after him.

Sir Jagadish Chandra Bose (1858-1937) and Sir Prafulla Chandra Ray (1861-1944), two compatriot contemporaries of Kabiguru, and their great students: Statistitian Prasanta Chandra Mahalanobis (1893-1972), Quantum Physicist Satyendranath Bose (1894-1974), Astrophysicist Meghnad Saha (1893-1956) and Photo-Chemist Jnan Chandra Ghosh (1894-1959) were all polymath with extra-ordinary talents in their respective subjects and patriot of highest order. Prasanta Chandra Mahalanobis, basically with degrees in Physics, was a world renowned Statistician without any degree in it for his stupendous contributions including his invention of 'Mahalanobis distance' which enjoys enormous applications in all branches of Sciences including medical studies, social sciences, technologies, engineering including industries. He was the father of statistics in our subcontinent and practiced secularism. He is believed to be an atheist.

Nobel Laureate in Literature 1950 Bertrand Arthur William Russell (1872-1970) was a wrangler in Mathematics from Cambridge University. Russell with good British education in the UK had a free mind to become a British polymath as he could move freely around philosophy, mathematics, history, literature, social criticism and political activity. His philosophical essay, On Denoting, has been considered as a paradigm of philosophy. He condemned the US involvement in the Vietnam-war. He was always antiwar. He urged that all nuclear-weapons should be halted. In the present era, renowned Cosmologist Stephen William Hawking (1942 -2018) has been labeled as a disbeliever in God. But God had been pleased to honour him with many laurels as he served His creation with all his devotion. Mahalanobis, Russell and Hawking did not show any disrespect to other believers.

In the nineteenth century during the British colonial rule in the Indian sub-continent, a bunch of brave, talented and patriotic personalities appeared in Bengal. They include Michael Modhusudan Dutt (1825 - 1873), Ishwar Chandra Vidyasagar (1820-1891), Jagadish Chandra Bose (1858-1937), Rabindranath Tagore (1861-1941), Chitta Ranjan Das (1869-1934), Khudhiram Bose (1889-1908), Prasanta Chandra Mahalanobis (1893-1972), Meghnad Saha (1893-1956), Surja Sen (1894-1934), Satyendranath Bose (1894-1974), Jnan Chandra Ghosh (1894-1959), Subhas Chandra Bose (1897-1945), Kazi Nazrul Islam (1899-1976), Mohammad Quadrat-e-Khuda (1900-1977) to name a few. The reason behind the concentrated germination of the talents is that oppression and torture coupled with good education in the British rule generated braveness, diligence, comprehension, creativity, patriotism and challenges to whip up attainments.

4. Preparing Background Knowledge for Scientific Researches

Scientific and technological researches, supplemented by researches in other fields, are pivotal to the progress of a country. Course-curricula at different stages of education are designed to prepare the students for the future researches. The primary education, which is most vital, is aimed to train up students for discipline, etiquette and learning with pleasure. In the secondary stage, the students are taught with comprehensive education for expression and judgment with logic and free mind. As my reverend teacher of Intermediate Science (presently H.Sc.) course during 1957-1959, Makhanlal Chakarborty Sir in Edward College advised, your learning should be adjudged by " trying to visualize what you learnt throughout the day. If you can, you learnt. If not, read and think over again. You should be up-to-date at the end of the week. Otherwise you will be unable to cope with the new learning in the next week". I practiced this valuable advice throughout my life.

In the tertiary stage, the students are equipped with qualities for facing the competitions and hardships in livelihood as well as for developing creativity needed for research. Students should be able to comprehend their studies by themselves. This is universally accepted. But they are free to discuss their academic problems during weekdays and working hours with their teachers. However, the students in the universities of our country, in general, have poor background knowledge to cope with the tertiary education and are beset with many-fold weaknesses to be bogged down. They are even unable to locate their problems to discuss with their mentors.

It is generally agreed by academicians and education researchers [media reports including a recent typical one titled, "Can we prevent a potential collapse of the current education system", published in The Daily Star (DS) presentation dated 20 April, 2021 on page 8] that the quality of Higher Education in Bangladesh has declined steadily over more than four decades. Dr. M. Tamim, Professor of Petroleum Engineering, BUET, in his article titled, "The State of Research in Bangladesh", published on the Opinion page of April 30, 2021 issue of the Daily Star, remarked that 'without good graduate students, faculty research will be completely handicapped'. During the partition of the British India in 1947, the standard of education and research in our country was at par with that of India. We can recall that in 1925 Satyendranath Bose presented the world with his ground-breaking invention of the Quantum Statistics which earned fame for Dhaka University. With the passage of time, India is improving in technological developments and is trying to trail China closely. On the other hand, in spite of being the successors of Sir Jagadish Chandra Bose, (teacher of Satyendra Nath Bose) and Sir Prafulla Chandra Ray, (teacher of renowned photo-chemist Jnan Chandra Ghosh) the two great pioneers of scientific researches in the subcontinent, we are lagging far behind India.

5. Realization of Bangabandhu and his Sacrifices for our Independence

Bangabandhu Sheikh Mujibur Rahman, received good education from the teachers of British India. He could realize that after the creation of Pakistan, Government of Pakistan exploited religion to extort our earned foreign currency from the export of jute and utilize that for wellbeing of West Pakistan. Bangabandhu noted that our education standard had been declining with the migration of teachers and intellectuals with the advent of Pakistan creation. The misrule of the Ayub-Monem regime in the middle of sixties triggered mainly two-fold effect: (1) uprising of Bangladesh movement leading to our independence and (2) a gradual loss of values in our educated people in all sectors. The final picture stands as 'values and judgment' are eroded through the growth of selfishness. This attitude leads ultimately to unlimited 'material greed', the most dangerous form of our social virus which overcasts our human qualities including judgment. Good education instills free mind with values which acts as an antidote to our immense greed.

Awami League won the 1970 election of Pakistan with overwhelming majority bagging almost all parliamentary seats in East Pakistan and absolute majority in whole of Pakistan. Denial of the martial Law Government to hand over power to Awami League, braved Bangabandhu Sheikh Mujibur Rahman to deliver the Landmark Speech of 7 March 1971 declaring Independence in case the Pakistan Army did not respect democratic result of the election. In response, the Pakistan Army inflicted a brutal genocide in East Pakistan starting on the night of 25 March. Bangabandhu was imprisoned in the morning of 26 March just after he declared independence in the early hours. This triggered the Liberation War as per proclamation of Bangabandhu in his Paltan maidan speech. Emergence of the secular Bangladesh was the culmination of the 9 month- long Liberation war at the cost of martyred intellectuals, gallant freedom fighters and lives of 3 million innocent people and brutal raping of our mothers.

On 15 August 1975, some of young army officers, lacking in values and lured by big positions, killed Bangabandhu and his family including 10 years old son Sheikh Russel, excepting Sheikh Hasina and Sheikh Rehana who were visiting abroad. In 2004, Bangabadhu Sheikh Mujibur Rahman was adjudged best Bengali in the 1000 years history of Bengal and also the best Bengali of all time according to the opinion poll conducted by BBC with Rabindranath Tagore in the second position. The Mahatma Gandhi Peace Prize 2020 has been conferred to Bangabandhu Sheikh Mujibur Rahman in recognition of his outstanding contribution to social, economic and political transformation through non-violent and other Gandhi methods.

Bangabandhu in his 'Prison Diaries', expressed, 'Sacrifice wins idealism'. Bangabandhu's enormous strength may be ascribed to his inherent secular mind, which gained maturity through jail sentences of various types during the Pakistan rule. He remains immortal through all his activities. The oppression of Pakistan, although resulted in a Sovereign Bangladesh, but their weak and non-secular education system produced a gradual decline in education standard and eroded the human values. We inherited this decline in human values after our independence. The contamination was so deep rooted that even the 2010 National Education Policy of Bangladesh could not yield a tangible effect.

6. Present State of Scientific and Technological Advances

Presently, the global scientific achievements are being accelerated forward at an unbelievable rate. The success of NASA's Apollo 11 space-flight, that first landed humans, Neil Armstrong and Buzz Aldrin in 1969, encouraged many space-programs, manned and unmanned. Recently, NASA's Perseverance rover landed safely on the planet Mars and started

making oxygen [The Daily Star presentation dated 23 April 2021, page 12]. This is followed by China's Zhurong rover which has also started roaming on the Martian surface [The Daily Star (DS) presentation dated 23 May, 2021, page 12]. It is a great stride in the quest for finding a future human abode when our earth becomes inhabitable with the sun-temperature rising too high.

The inquisitiveness about the cosmos has also brought forth phenomenal prosperity in science and associated technologies. Nasa's probe findings that our Milky-way Galaxy is spiral and warped, not flat and releases a lot of energy occasionally vivid flares suggest that the centre of the Milky-way exploded 3.5 million years ago and there exists a huge black hole at the centre of our galaxy. NASA photo shows a 'violent energy' released from our galaxy [The Daily Star report on 01 June, 2021, page 12]. NASA probe also captured eerie sounds from Venus (radio signals) [The Daily Star report on 9 May, 2021, page 12]. All these news create a great interest amongst the cosmologists.

The world during recent years witnessed stupendous scientific achievements. In particular, the experimental confirmations of 'Higgs Boson', the so-called God's particle, in 2012 and gravitation wave, predicted in the century old Einstein's Relativity theory, in 2016 which could be realized with global collaborations of advanced Science, Technology and Engineering.

7. Fruits of ICT Bangladesh has attained so far

With the global connectivity through World Wide Web (www), enhanced speed in accessing the treasure trove of information through the installation of 'submarine optical fibre' in the first decade of the twenty first century and improvement in the digital facilities through ICT centres; Bangladesh in the recent years has made a great stride in many areas as reflected in the recent performance indices of global ranking. Tremendous growth in the production of important food items is notable. The fish production has gone up so much that its prices have gone down substantially over those existed a decade ago. People's average life expectancy in Bangladesh is now enhanced substantially over that of a decade earlier. Research activities in genome technology gained momentum following the remarkable success in the development of fungus resistant jute in 2010 by the Bangladesh team working under Late Dr Maqsudul Alam, a Bangladesh born Professor of Hawaii University. Biodegradable jute fibre is second only to cotton in making apparels, bags, carpets and other attractive items as exposed in an environment fair at Sher-e-Bangla Nagar.

Construction works for two 1200 MW nuclear power plants in Rooppur began on 30 November 2017 and is expected to supply us atmospherically cleanest form of 1200 MW electricity in the first phase by 2025, now expected to be delayed by the COVID-19 pandemic. With the successful launching of geostationary communication satellite Bangabandhu-1 on 11 May 2018, Bangladesh now finds its pride position in space. Bangladesh now braves the construction of Padma Bridge from its own resources. Our living has also become much more comfortable. Research activities are being pursued at an accelerated rate in all universities and research institutes, albeit with satisfactory quality in only a few. We are going to have a Metro-rail very shortly in Dhaka to take off the traffic jam and to mitigate the inconvenience of commuters in their travel to the working places.

In view of that Bangladesh has met all the eligibility criteria like Per Capita Income, Human Assets and Economic and Environmental Vulnerability, the UN Committee for Development Policy has recommended Graduation of Bangladesh from the category of Least Developed Country (LDC) to the category of Developing Country. It is hoped that the recommendation will be finally approved by the UN General Assembly in September, 2021 [The Daily Star Online Issue of 03 June, 2021, time 02:20 pm, front page].

8. Weaknesses and Problems impeding the expected Growth of Bangladesh

In spite of all glorious developments stated above, Bangladesh received on 4 Feb 2016 a shocking experience of cyber heist of US $ 101 million from Bangladesh Bank to other countries. Moreover, we had a long-standing problem of 'question leakage' of various examinations which concerns the future career of our students. These are harmful examples relating to the abuse of digital facilities made available to the common mass even through cell and smart phones in Bangladesh.

There is yet another disappointing misuse of our digital facility to alarm us before it goes out of control. The young teachers and researchers in Bangladesh have been kept lured for the last decade to publish rubbish articles in the so-called 'online journals' with a payment of fees to get their easy promotions. I know there are many cases with promotion to Professorship with these types of publications. The appointing administrations in most cases are ignorant about the magnitude of damage being caused to our education setup. I am delighted to note that UGC has recently taken up cases of plagiarism used in the publications for some promotions. We heard of, with an utter disappointment, the alleged adulteration of gold in the Bangladesh Bank vault. These are culmination of 'immense greed' of educated people. Excessive greed puts creative power in an abyss of despair. Only policy, action and financial support are not sufficient to rejuvenate our education system.

9. Sources generating Socio-economic Problems in Bangladesh

Our main problem is embedded in our mindset to measure dignity in terms of wealth in possession and to derive comfort out of laziness. Moreover, our values are switched off with the lack of accountability and quality assessment in our systems, academia in particular. As a consequence, job seekers for jobs and service-holders for promotions and money-making become crazy to welcome any method to give them easy achievements. On the other hand, parents and guardians, in general, are blind to the easy attainments of good grades of their children in the examinations. The chase for easy success triggers them to bribe the examiners which results in a business-bonanza of the question leakage. Improper education leads to "big dreams without having matching quality to earn". These hollow dreams with suspended values lead to dangerous ends, even gruesome killings.

Pleasure and satisfaction are subjective of mental condition and derivative of knowledge. Only money cannot buy these. Money and material property may be plundered by social disarray and natural calamity, but knowledge is non-perishable. Knowledge with free mind has immense power to decision-making and leads to creative works for deriving profound satisfaction. Our students, in general, are no less meritorious than their counterparts in developed countries. Our poor social environment and education system make them generally inferior. Even in the tertiary stage, the students, with very rare exceptions, need constant help in terms of logic, language (even Bangla), application of simple mathematics and statistics, and fundamentals of Physics and Chemistry to understand what they study. A few years back, they did not have any feeling of what they don't know. In the sea of their ignorance they try to seek a straw of any 'short-cut-way-to-success' without considering its consequence that might befall upon them. With the advent of ICT, they now realize their weaknesses compared to the counterpart students abroad and get despaired. With pains of ignorance many of them become addicted to drugs and they are led to terrorism and other activities detrimental to the society.

The unprecedented corona-virus pandemic and its continuing scourge with increasing menace are disastrous in the following ways:

(i) The great Centenary Celebration of Bangabandhu and the Golden Jubilee of the Bangladesh-independence are being observed under-relished.

(ii) A large chunk of our national budget has to be allocated to put fight against COVID and to pay off in helping the migrant and returning Bangladeshi workers, recently made unemployed from abroad. The budget will also have to take care of the poor created new due to lockdowns in Bangladesh.

(iii) The national revenue collection is hardened.

(iv) Studies of the students are greatly affected. This leads to further weakening of the already knowledge-toddled students.

10. Solution to the Problems impeding the expected Growth of Bangladesh:

(i) Problems relating the abuse of digital facilities are culmination of 'immense greed' in educated people. To alleviate the problems facing us, only option is to impart quality education with a focus on values before the tertiary stage. The teachers and parents have to lead a restrained living. This is because in order to impart the above qualities to the students, there must be conformity between the word and action of the teachers and guardians to avoid the confusion of the students in learning from the superiors. There should be also harmony amongst the teachers, guardians and politicians. All these can be realized only when our material greed can be pacified through acquiring proper knowledge concerning religions, politics and conventional education. Unfortunately, none of the teachings is working effectively. Effective education can act as detergent to material greed and generate a free mind.

(ii) The students already in the tertiary education should remain in constant touch with their teachers online to get their help in their difficulties. The teachers have to be dedicative to respond to the students' problems. Locating the problem to discuss with the teachers is also very conducive to the students in the learning process.

(iii) The examination days should have no breaks like those prevalent in sixties. The system should be started from the primary stage. The students from the primary stage will be habituated to the examination system without breaks and will find no problem in facing the examinations in absence of breaks at higher stages. To be adapted to the examinations with breaks, the students themselves will be forced to work out how to be creative, logic and diligent as memorizing without any concept in the subject does not work fruitfully. The teachers and guardians should be united in braving the students to face fearlessly the examination without breaks and to provide encouragements saying that this sort of examination will make them globally competitive to earn successes.

(iv) The recruitments of new teachers at all stages should be accomplished through a written examination of short duration

(say 15 minutes), with instant questions from each of the members of the selection committee, followed by an oral examination. This can ensure impartial appointments of the best available teachers who can find interest in rearing up talented students to feel proud of their future global attainments.

(v) The teaching should be performed on an interactive basis. Both the students and teachers can be benefitted by the two-way discussion. Sir Prafulla Chandra Ray stressed that "Students should be taught not only in words but also in action".

(vi) Scientific collaborations can awaken greatly our comprehension that now pervades the vastness and subtlety of the universe. Scientific researches not only bring forth prosperity but also unite people globally and intensify universal relationship. This endeavour is essential for the world peace, particularly in the restless situation during the COVID pandemic now prevailing worldwide. Moreover, scientific exposure to our youngsters through research collaborations can enable them to understand the value of life, which can keep them busy with meaningful activities. The senior researchers should open up research projects with locally available facilities to boost the process of training quality manpower for export and to cater different organizations in Bangladesh for manning with honest and creative staffers.

(vii) Bangladesh Academy of Sciences (BAS) is a strong forum with topmost scientists, technologist, doctors and engineers. The fellows have responsibilities to safeguard the status of science and technology to enhance quality in research publications and hence to uphold their own dignity. I believe, BAS fellows can fiercely mobilize their knowledge-power to uplift our research standard.

11. Quality Education and Research to sustain our Graduation and On-road to Prosperity:

Quality teachers and researchers should be allowed to act as flagship of our country. The trinity of qualities, namely honesty, values and judgment instilled in the youths through quality teaching and research works can provide our posterity immense power: (a) to make them successful in global competitions, (b) to safeguard the ICT installations from being hacked (honest and skilled online managements can contain corruptions to a great extent), (c) to provide ability to publish research article with standard close to that of Quantum Statistics by Physicist Satyendranath Bose (to raise dignity of our country globally), (d) to ensure achievement of our hard-earn "Graduation from Least Development Status (LDC) to the status of Developing Country" and to sustain the On-road to Prosperity and (e) to accelerate the achievement of 'Sonar Bangla', the long cherished dream of Bangabandhu, for which he sacrificed lives of himself and his family.

Steve Jobs (1955-2011), inventor of Apple-Macintosh computing system suggested for big attainments, "Stay hungry (for knowledge) and stay foolish (to remain polite and honest)".

A famous quote of Oliver Napolean Hill (1883-1970), an American author best known for his book, 'Think and grow rich' in 1937, goes as "Every adversity has the seed of an equivalent or greater benefit".

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07 June, 2021

Desertification and Drought Day 17 June 2021

Prof. Dr. Zahurul Karim

Today is the 17 June Desertification and Drought Day 21. The theme of the day is announced by United Nations Convention to Combat Desertification (UNCCD) "Healthy Land for Healthy Nation". Land Restoration can greatly contribute to Post Covid19 Economic Recovery, investing in Land Restoration creates Jobs and Generate Economic Benefits and could provide Livelihoods at times when hundreds of millions of jobs are being lost. This day is being globally observed by all member countries.

Land degradation, climate change and loss of biodiversity are intimately linked, increasingly affecting human well being. It's pertinent to have a quick look of some Vital Signs of the health

* Globally 23% of lands are no longer productive; 73% lands are transformed from its natural state to mostly for agriculture;
* As of now dry lands cover 40% of the earth's land area and 43% of world's cultivated land;
* Over last 40 years nearly one-third of the world's cropland has been abandoned;
* In the last 40 years global temp has raised 1.140C and currently increasing at the rate of 0.18C per decade;
* Warming Ocean temperature is 0.330C since 1969;
* Greenland lost 279 billion tons of ice sheets per year and Antarctica lost 140 billion tons of ice /yr;
* Disappearing snow caps in the Alps, in the Himalayas, Rockies, Alaska and Africa;

* Snow cover decreased in the Northern Hemispheres - snow is melting and declining in the Arctic Sea Ice rapidly;
* As a result, the sea level rose about 25cm.

Furthermore, land degradation is largely affecting quality of water and biodiversity:

* Acidity & surface ocean water has increased by 30% since beginning of IR
* Salinity pollution has increased by 1/3rd of all rivers on 3 continents.
* Globally one in 3 people do not have access to the safe drinking water.
* One third of the global biodiversity is lost due to degradation of fresh water
* Bad green house gases such as CH_4, Nitrous Oxide, CO_2 and fluorinated gases have increased manifolds.
* Severe pathogens already affecting around 1/3rd of all rivers in Latin America, Africa, and Asia.

Land is a finite resource. It is built over millions of year but would be damaged within a short period of time if proper care is not taken. Land degradation is mostly human made and could be avoided by judicious use of land resources. Land is composed of many different components including soil, air, water, animals, plants and microbes. Therefore, soil is a living system it supports lives and livelihood of all flora and fauna, biodiversity and global atmospheric composition. Microbes play a dominant role in soil biochemistry revitalizing its life. Soil is the store house of nutrients and antibiotics.

People at all levels realize that land is a part of the solution through:
-Restoring degraded land bringing economic resilience, creating jobs, raising income and as a whole increasing food security;
-Helping biodiversity to recover;

-Locking away the atmospheric carbon warming the earth;
-Slowing climate change;
Therefore, degradation of land means destroying natural wealth –an irreparable loss; it's like digging of own graves.

Land degradation must be stopped or slowed down. Keeping this in mind the global communities are greatly concerned. The international community has long recognized that land degradation/ desertification are major economic social and environmental problem to many countries in all regions of the world. In 1977 UN conference on desertification (UNCCD) adopted a Plan of Action to Combat Desertification (PACD). Despite this and other efforts UNEP concluded in 1991 the problem of land degradation in arid and dry & sub-humid areas had intensified. As a result the question of how to tackle desertification was still a major concern of the United Nations Conference on Environment and Development which was held in Rio de Janerio in 1992. The conference supported a new integrated approach to the problem emphasizing action to promote sustainable development at the community level. The conference called on the UN general assembly to establish an Intergovernmental Negotiating Committee (UNCCD). The Convention was adopted in Paris on June 17, 1994. This is the day which are being observed today by all member nations. It arranges COP's negotiation, dialogue and prepares technical report.

The UNCCD has established four knowledge hubs.

* Tools for Local Distribution Network (LDN)
  It provides knowledge, tools and guidance of LDN
* The drought tool box
  It provides UNCCD stakeholders with easy access to tools, case studies and other relevant resources.
* Science Policy Interface (SPI)
  It promotes dialogues between scientists and policy makers on desertification and land degradation.
* Sustainable Land Management (SLM)
  It indicates best practices on sustainable land management technology in Co-operation with World Overview of Conservation Approaches and Technologies (WOCAT)

All these hubs are working nationally, regionally and internationally and contributing to the UNCCD secretariat and supporting different Conference of the Parties (COP) I have been working as one of the member of ten globally selected independent scientist of Science Policy Interface (SPI) since 3 years. At the SPI we are reviewing about the status of the different member countries on Local Distribution Network (LDN) and drought and desertification in order to support different dialogues, negotiations and COPs in the area of land, water, biodiversity and other environmental related resources.

In Bangladesh, the economy, lives & livelihoods and food security of majority of people largely depend on agriculture. Land resources are the fundamental base. The progress of the nation depends on maintaining LDN-Healthy Land for Healthy Nation.
LDN is a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increases within specified temporal and spatial scales and ecosystems.

The key pillars of LDN are:

* Maintain or improve the sustainable delivery of ecosystem services
* Maintain or improve productivity to enhance food security
* Increase resilience of the land and populations dependent on it
* Seek synergies with other social, economic and environmental objectives
* Reinforce responsible and inclusive governance of the land

LDN contributes not only to the achievement of national LDN goals; it has positive synergies with other national commitments. Additionally, LDN provides a useful framework for action in multiple Sustainable Development Goals (SDGs),

such as ending poverty (SDG 1), zero hunger (SDG 2), gender equality (SDG 5), clean water and sanitation (SDG 6), affordable and clean energy (SDG 7) and climate action (SDG 13).

Some organizations (SRDI, BARI, BRRI, BJRI, BFRI, etc.) are working on Land & Soils in Bangladesh but they are mainly working on soil fertility. The Department of Environment (DoE) are coordinating some research outcomes from different institutions' on land degradations and climate change. The DoE has some small projects. The Department of Agricultural Extension (DAE) promoting land use for crop production. Land is being mined in intensive crop areas. There are denuded areas within the protected forest areas. Land is being over used/misused for different purposes. River side erosion and landslides in the sloppy lands are serious concern. Top soil loss is in large number of brick kilns degrading land quality of agricultural land. Most alarmingly we are losing about 1% of the arable land per year due to pressure of other uses and river bank erosions.

I want to mention here some major concerns of the land degradation and loss of land due to improper implementation and poor management of some large Government projects. Almost every year there are beaches of Coastal Embankments in the South and South Western Regions of the country resulting in large inundation by brackish and saline water, deteriorating the quality of land and destroying lives and livelihoods of millions of people. Why not we build Climate Resilient Embankments. In the south western region there are many dilapidated polders for long time. No cultivation is possible; even in some polders fish farming is not feasible because the water in the polder is devoid of oxygen. Embankments and polders came from the Netherlands- where these are called No Regret Measures. But in Bangladesh people regret every year. This is a great environmental problem. Let us build climate Resilient Embankments so that our people do never regret or suffer due to breaking down of embankments or other related structure We are not sure about the submersible embankments in the haor areas. We have seen by some flash floods these are washed away, degrading soil and water of the area. I would urge to revisit all these structures which are largely degrading land resources in our land hungry country.

I would like to suggest a few activities in order to protect our land and water resources.

1. No good agricultural land should be used for other purposes, such as for settlements, govt. infrastructure and industries. We should enforce protection of good agricultural land and save /restore each and every inche of land.
2. Since the task is daunting but very important, small projects of short duration will not be useful. The Government should support different institutes/DoE and other concerned agencies to develop and carry out some core projects on land degradation with enhanced budgetary system to strengthen coordination, field monitoring and awareness building throughout the year.
3. Any structural solution to manage erosion, intrusion of saline water and increasing irrigation facilities must be through Climate Resilience Structures. No lands would be damaged in constructing any structures or irrigation system. Before undertaking any project O & M must be ensured with compliance of social and environmental safeguards. The capacity of the local communities should be developed and their participation must be ensured all through in the project construction, implementation and management.

I wish the day a great success.

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