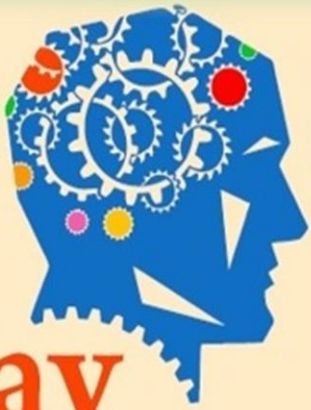

Stray Thoughts

By

Mirza Abdul Aleem Baig

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PREAMBLE

"We Can't Solve Problems By Using The Same Kind Of Thinking We Used When We Created Them".

– (*Albert Einstein)*

The instantaneous tangible results of science and technology make it easier to evaluate than philosophy, theology, art, or poetry. As George Sarton stated, science is unique in showing a cumulative progress. Newton explained his tremendous achievements by saying that he stood on the shoulders of giants. Our modern-day writers, artists, and philosophers are not appreciably more effective than those of the golden age of Greece, yet the average science student understands much more of nature than the greatest of Greek scientists.

Science is first of all a set of attitudes. It is a character to deal with the facts rather than with what someone has said about them. Rejection of authority was the theme of the revival of learning, when men dedicated themselves to the study of "Nature". Science rejects even its own authorities when they hamper with the observation of nature. Similarly, science is an enthusiasm to accept facts even when they are contradictory to desires. It is clear, then, that science has something. It is a unique intellectual process that yields remarkable results. This is especially important when we extend the methods of science to new fields.

I feel obliged to share my knowledge, analyses, recommendations, and conclusions through this book. Basically, this book is compilation of my columns published at different platforms e.g. Technology Times Pakistan, Diplomacy Pakistan Network and Modern Diplomacy etc. between 2012-2020. Optimistically, this account will elevate the level of awareness among the general public and initiate the dialogue that, in turn, may entail major changes. The beneficiaries will be all of us – ourselves, our beloved, our children, and the society, as a whole – who will live prosperous life.

This book can be read on two diverse levels. First, it may be read by general public with a limited scientific background. The second group of readers will be represented by professionals from the scientific community, academia, government agencies, R&D industries, electronic and print media, as well as science societies and advocacy groups. I do not expect everyone to agree with the content and ideas put forth in this book. But, I do hope that the knowledge and information presented will be a wake-up call for the general public, leaders, policy-makers, legislators, and scientists coming to the realization that the current state of affairs is not satisfactory, to say the least, and it needs to be fixed – immediately.

The book comprises five parts. Part-1 "Diplomacy and International Relations". Part-2 "Governance". Part-3 "Security and Policy. Part-4 "Health". Part-5 "Socio-tech".

I anticipate this book is widely read. If we are to avoid the blunders of the past, then we need to change and revolutionize the direction and start benefiting from the knowledge, science, technology and innovation. We did not have this opportunity a decade ago. Now is the right time.

Mirza Abdul Aleem Baig
Pakistan

DEDICATION

To my lovely Mom and Dad, they have been so supportive, encouraging and caring unlimited.

Without their encouragement, I would not be able to accomplish learning quest on my own!

&

For all those who encouraged me to fly towards my dreams, especially this one. . .

I Am Not In Competition With Anybody But Myself. My Goal Is To Beat My Last Performance. The Only Person Who Can Pull Me Down Is Myself, & I Am Not Going To Let Myself Pull Me Down!

Diplomacy and International Relations

"Science Diplomacy" – New Mode Of Foreign Policy In The 21st Century

Historically, foreign policy can be assumed to have emerged when contacts between the earliest human societies took place and foreign policy conduct refers to the actions sovereign states take toward each other. It is significant to note that these actions generally are not taken as ends in themselves but are joined in some way to larger principle from long run aspirations to more immediate aims that national leaders hope to achieve in their dealings with other countries.

GLOBALLY, S&T IS PLAYING A CRITICAL ROLE IN INTERNATIONAL AFFAIRS, LARGELY THROUGH ITS CONTRIBUTION TO TECHNOLOGICAL SUPREMACY.

Sometimes the two terms, foreign policy and diplomacy create confusion. The most appropriate way to distinguish between the two terms is to consider foreign policy as the legislative and diplomacy as the executive phase of the foreign relations of a country. It is believed, foreign policy is an extension of internal or domestic policy and is planned to defend and promote national interests of whom domestic policy is a fundamental part. Often domestic policies have to be made deferential to foreign policy for the reason that without success in foreign policy, there would be no domestic policy left to pursue.

Globally, science and technology is playing a critical role in our international affairs, largely through its contribution to technological supremacy. In the well networked, globalized world of today, science and technology can play an innovative and positive role in foreign policy issue since S&T serves as a common language and a link

amongst peoples when they strive to address both the technical and technological disparities of the 21st century.

Science and technology are judged by many developed and developing countries to be of essential importance to their development, not only in terms of intellectual achievement, but also, as an economic driving force. Ultimately, this is reflected in the mounting importance of "Science Diplomacy", i.e. the building and management of international relations based on science, higher education, and technology. Scientifically developed countries have been active in this arena for decades, now developing and least income countries, for instance Pakistan, are expressing greater interest in implementing science diplomacy. According to Vaughan C. Turekian (Editor-in-chief of Science & Diplomacy), nations are looking to science to achieve some or all of the three Es of science diplomacy:

a) Expressing national power or influence,
b) Equipping decision makers with information to support policy, and,
c) Enhancing bilateral and multilateral relations.

It is necessary to recognize, science diplomacy is not new, but it has never given due attention in developing countries. The American Association for the Advancement of Science (AAAS) and the Royal Society noted that science diplomacy refers to three main types of activities.

1) "Science in diplomacy" – Science can provide advice to inform and support foreign policy objectives,
2) "Science for diplomacy" – Scientific cooperation can improve international relations, and,

3) "Diplomacy for science" – Diplomacy can facilitate international scientific cooperation.

It is whispered that Pakistan's foreign policy has always been branded as policy of self-abnegation. It is also blamed that external factors predominantly USA play a central role in the shaping of foreign policy of Pakistan. Paul Kennedy, a famous British historian at Yale University, in an essay "Pivotal States and U.S. Strategy", named Pakistan as one of the nine pivotal states whose future evolution would not only determine the fate of their region, but also, affect international stability. It is significant to note here, good relations with neighboring countries are important to any country and are measured a strategic policy in international arena. Across the world, foreign policy of every country rotates around two main axles. The first is having good relations with the neighbor countries and the second one being establishment of cordial ties with those who can help the country meet its national interests.

As a final point I would like to add, in the region Asia as a whole, and particularly South Asia, Pakistan is most suitably situated of geopolitical, geostrategic and geo-economics terms. Thus, science diplomacy can contribute a lot to the establishment of reliable relations to South Asian and Central Asian states for the socioeconomic and technological supremacy of Pakistan. In the modern period of swiftly globalizing world, Pakistan's foreign policy considerably needed a fresh look. The development and execution of foreign policy based on science and technology "Science Diplomacy" must be most important concern for not only the government but also other institutes that contribute key role in the formation of foreign policy of land of Pakistan.

Published on: 10th May, 2015

Science In Diplomacy: A New Dimension For Foreign Policy Of Pakistan

"The soft power of science has the potential to reshape global diplomacy" – **Ahmed Zewail**

In a swiftly changing world where new global challenges influence every country, science is not only one of the vibrant forces in socioeconomic progress but also, promoting globalization roles that will exaggerate in the future. Science is considered as a neutral area and has no nationality. In this respect, it is comparatively easier to build up international cooperation through science rather than political or military relations. Moreover, science can play a bridging role between the nations through their scientists which have fragile political relations. It means the deployment of science as a tool of diplomacy – Science in Diplomacy, for the sake of developing better relations among nations.

SCIENCE DIPLOMACY IS A REFLECTION OF THE SIGNIFICANCE THAT EACH COUNTRY AND GOVERNMENT GRANTS TO S&T IN DESIGNING AND IMPLEMENTING ITS FOREIGN POLICY.

Science Diplomacy (SciDip) is a reflection of the significance that each country and government grants to science and technology (S&T) in designing and implementing its foreign policy. Up till now, the most developed countries have adopted actions aimed at raising the profile of S&T in decision-making on international affairs, strengthening their S&T activities in foreign policy. The USA, United Kingdom, Japan and New Zealand have created the position of Scientific Advisor in their respective Foreign Ministries; the United Kingdom and Switzerland have integrated their Scientific Councils into their Industrial Councils

to better recruit world-class scientists and carry out collaborations, whilst promoting the internationalization of innovation. International scientific and technological cooperation has also become a leading aspect of US foreign policy. The Department of State (DoS) has a Science and Technology Adviser to the Secretary of State, making the USA one of few countries in the world with such a government position. The American Association for the Advancement of Science (AAAS), in coordination with the DoS, runs an ambitious grant program for training scientists in the areas of S&T policy within the US government. The DoS scientific diplomacy strategy focuses on promoting overall participation in areas that involve S&T.

Regarding SciDip, the Japanese government established its main policy lines in a document by a group of experts in the field and that document specifically establishes 15 lines of action for utilization of science in diplomacy. For at least the last decade, Germany invests a great deal of effort in international cooperation in the field of education and science through its Ministry of Foreign Affairs. The German Ministry of Education and Science has its own office for the internationalization of science that receives expert advice. For instance, Germany has been building "Science Houses" in other countries, devoted exclusively to disseminating German technology, innovation and science.

Science in diplomacy is, today more important than ever for:

- Contributing to resolving the most pressing challenges of globalization, such as climate change, food security, pandemics, natural disasters, nuclear proliferation and cyber-security etc.

- Achieving long-term sustainable development, in keeping with the Sustainable Development Goals (SDGs) of the 2030 Agenda.
- Promoting collaboration and harmony in international relations since scientific cooperation can serve as a communication channel when diplomatic relations is inactive.

Geographically, Pakistan is one of the most imperative states but, we could not get its maximum geopolitical benefit. Pakistan needs not only to revitalize bilateral and multilateral relations with neighbors and regional countries but also, world-over for peace, progress and prosperity of our people and also to play the decisive role in the region according to current regional and global scenario. As Pakistan's new government has formed, now there is a need to revive foreign policy beyond traditional way to achieve our national objective with the mutual consent of all stakeholders, which must be in Pakistan's best interest and that will benefit the people on the top. Government should make strenuous efforts for getting regional cooperation for peace, progress and mutual development; enhance strong diplomatic relations with primary focus on neighbors by resolving all disputes with regional countries. Unless region is peaceful, our efforts for growth and development will not be succeeded. In this regard, the Government of Pakistan (GoP) and foreign policy planners must utilize science in diplomacy as a new dimension for foreign policy of Pakistan and perform the following roles:

- Devise the S&T based foreign policy and clear position to science and technology diplomacy (STD) as the new axis. Produce policy papers on subject arising in SciDip, science based foreign policy and strengthen diplomatic proficiency.

- Utilize S&T personnel in diplomatic activities/missions and scientific knowledge in formulating and implementing diplomatic policy and highlight the connection between science and socioeconomic development.
- Develop and implement policies that will strengthen Pakistan science and engineering through international cooperation and monitor S&T development abroad to understand the S&T strategies of other nations for diplomatic agendas and regional groupings.
- Set a diplomatic agenda based on scientific evidence and advice, and lead international efforts and proactively convey the message that Pakistan will take leadership role for the solution of global challenges by using S&T to achieve desirable international circumstances.
- Continue its efforts to strengthen good governance, with emphasis on merit based institutional development and the rule of law, and exceptionally eliminate corruption and nepotism from society as-a-whole.

Published on: 22nd August, 2018

Technopolitika: Science & Technology In International Relations

Science and technology (S&T) are at the same time symbol and engine of modernization. They are therefore subjects of importance and controversy for developing countries. Science is valued for its close relationship to technology and shorthand phrase "Science & Technology" has become so embedded in the vernacular of international relations that it is almost impossible to avoid. As said by Alfred Thayer Mahan, *"In a globalized world economy, whoever has the technological edge will dominate the world."*

IN THE MODERN WORLD OF TODAY, S&T IS SO INTIMATELY ROOTED IN NATIONAL PRIORITIES AND INTERNATIONAL EQUATIONS THAT IT HAS BECOME AN INSEPARABEL COMPONENT OF IR. SINCE INDEPENDENCE, S&T DEVELOPMENT IN PAKISTAN HAS BEEN NEED-BASED AND NOT REALLY DRIVEN BY ANY 'NATIONAL ACTION PLAN'.

In international relations, S&T, economics and diplomacy are the most important tools for any nation. Historically, S&T has been one of the main currencies for exchange and dialogue among human societies and sovereign nations. In modern times, it is emerging as an important instrument of techno-economic power that will shape the changing dynamics of international relations. For every sovereign nation both S&T and diplomacy are essential tools for managing international relations, the essence of which is protecting national security and projecting national power. More recently, S&T has not only been effectively used by nations for soft-power projection and establishing the power-balance dynamics between sovereign nations but also, offering unconventional channels of engagement

amongst countries that may have political differences. In this changing paradigm, it is highly desirable to understand the importance of S&T dimensions of international relations and the changing dynamics of diplomacy among nations.

In recent past, economic globalization and volatile escalation of Information Communication Technology (ICT) has subjugated the political and corporate agenda that is defining a new prototype where competition and cooperation must coexist among most sensible societies and nations. This will call for skilful ambassadorial strategy of different priorities in future that will have to be based on sound understanding of the role of S&T in international relations. Our world is far more interconnected today, where no nation can afford to be isolated, no matter how powerful or self-sufficient. Technologies of global reach are changing the reference lines and timelines of the geopolitics of international relations, diplomatic perceptions and global affairs.

Since independence, S&T development in Pakistan has been need-based and not really driven by any 'National Action Plan'. Pakistan also performed very poorly in implementing the National Science, Technology and Innovation Policy (ST&I) 2012 and Science, Technology & Innovation Strategy 2014-18. While there have been many pockets of excellence in scientific research and technology innovation, the nation as a whole still fares rather poorly in S&T in comparison to most other comparable nations. As a result, there are no long-term plans for synchronizing S&T development or technology acquisition with the objectives of foreign policy or diplomatic agenda. Considerably, the government, S&T specialists and foreign policy makers may perform the following role:

- Government must get its own house in order; leaders should exhibit good moral character and exceptionally eliminate corruption and nepotism from ST&I Policy and from society as-a-whole.
- Establish the coordinating office for S&T based foreign policy and clear position to science and technology diplomacy (STD) as the new axis.
- Utilize science and technology personnel in diplomatic activities/missions and scientific knowledge in formulating and implementing diplomatic policy.
- Promote strategic joint research and development with partner countries with high diplomatic importance.
- Strategically target influential S&T related organizations and promote intellectual exchange. Set a diplomatic agenda based on scientific evidence, and lead international efforts.
- Proactively convey the message that Pakistan will take leadership role for the solution of global challenges by using S&T to achieve desirable international circumstances.

In the modern world of today, S&T is so intimately rooted in national priorities and international equations that it has become an inseparable component of international relations. In the future, S&T will play a role greater than any other factor in shaping relations among nations. Science and technology diplomacy (STD) will not only play the final defining role but also a central role in building and strengthening relationships with other countries. Today is high time for the scientists, scientific and technological communities of Pakistan to play a progressively more visible and critical role as knowledge brokers, creators and disseminators. In these efforts, science and technology diplomacy can and should be central to each of our nations' focus on foreign policy and our role in the world.

Do The Pakistan Government's Technology Transfer Strategy Even Work With Science Diplomacy?

Why have technology transfer strategies not been successful in Pakistan? Are we moving globally intended to technology transfer for nothing? Conceptually, the relation between technology transfer and foreign policy is rather an old phenomenon. Throughout the world history, they mutually influenced and had an impact on each other. Scientific age is said to have begun in seventeenth century. Later, technological development went alongside the economic growth. By the end of nineteenth century, role of science had become related to applications more closely as industrial research. In the twentieth century, industrial research became a self-sustaining system and vital factor in the amplification of technological innovation. When we come to the post-Cold War era and the twenty-first century, new challenges have become more prominent, such as environmental security and climate change, health and biosafety, biotechnology and biomedicine, cyber security and bioterrorism, food safety and genetically modified crops, nuclear proliferation and civil use of nuclear power, weapons of mass destruction, energy and water supplies, humanitarian crises

"GLOBAL PROBLEMS REQUIRE GLOBAL SOLUTIONS" …

IN OUR GLOBALLY-INTERCONNECTED SOCIETY WHERE URGENCIES OF THE PRESENT AND FUTURE MEET TODAY – S&T ADVICE IN FOREIGN MINISTRY IS PART OF THE SOLUTION TO ADDRESS THE ISSUES, IMPACTS, AND RESOURCES. WITHIN, ACROSS AND BEYOND THE BOUNDARY OF STATE.

etc. In today's world, many of the global challenges have a scientific aspect and no one single nation is capable of tackling these challenges alone. These new global challenges required new techniques for international cooperation, technology transfer and diplomacy. In other words, "global problems require global solutions".

In this context, Science Diplomacy – hereafter SciDip, as a concept and a non-traditional method of diplomacy and international relations had gained importance. In reality, it is not new, but as a concept it is quite contemporary. As can be exemplified through different country examples, the British Royal Society, which was established in the eighteenth century, has always used science as a tool to solve military and political problems. The concept gained importance, especially after the World War II, but even before the United Kingdom (UK) appointed its first accredited scientific representative to Washington in 1941. Then another British representative was sent to China between the years 1942-1946. NATO set up a science program in 1957 and US National Academy of Science (NAS) ran parallel Committees on International Security and Arms Control (CISAC) together with the Soviet Union Academy of Sciences (ASUSSR). After the end of the Cold War, the activities of SciDip gained a momentum is the countries like UK, USA and Japan etc. In the US, the post of Science and Technology Adviser to the US Secretary of State was established. In terms of the UK, their government established the Science and Innovation Network (SIN). This network is comprised of more than ninety staff working in forty cities in twenty-five countries and their main aim is to promote the scientific expertise of UK abroad and to build international collaborations in the area of S&T. Japan is another active country in this respect and has a formal SciDip policy since 2007 with the aim of increasing participation of Japanese scientists into international research programs, providing international scientific advice, and building scientific capacity.

In our globally-interconnected society where urgencies of the present and future meet today – S&T advice in foreign ministry is part of the solution to address the issues, impacts and resources within, across and beyond the boundary of state. Today, we are witnessing a growing presence of S&T in the whole UN system and the 2030 Agenda decisively admit not only the critical role of S&T but also formalizes its alliance through the establishment of initiatives such as the Technology Facilitation Mechanism (TFM). Correspondingly, technology transfer is an important issue and key component of economic and social development of Pakistan. The successful implementation of technology transfer depends not only on good technical specification but also, on the right social, political and institutional environment. The existing capacity of institutes in Pakistan is not sufficient and the situation demands that the Government of Pakistan (GoP) must establish merit-based institutions, with proper technical manpower to deal with the problems relevant to technology transfer and technological development. As said by Lewis M. Branscomb, "*Unless scientist and policymakers learn to work together effectively, both domains will suffer*". In Pakistan, there is escalating obligation on policymakers for science advice to transfer of technology because scientific evidence may help to manage risks and facilitate them to formulate better and effective regulatory and legislative decision. In this regards, the GoP may perform the following roles:

- Device the SciDip based foreign policy and integrates a science perspective into traditional foreign policy and creates an information platform for SciDip.
- Establish the coordinating office for SciDip to highlight the connection between science, social and economic development.

- Establish effective mechanisms for ensuring appropriate and timely scientific advice and define clear and transparent framework and rule of procedure for advisory process and mechanism.
- Implement measure that build societal trust in science for policymaking and work with international organizations to ensure coherence between national and international scientific advisory mechanism related to complex global challenges.
- Utilize science and technology personnel in diplomatic activities/missions and promote strategic joint research development with regional countries with high diplomatic importance.
- Continue its efforts to strengthen good governance, with the emphasis on merit-based institutional development and rule of law. And, exceptionally eliminate corruption and nepotism from the society.

Published on: 6th November, 2018

"Health Diplomacy" – Advancing Health & Foreign Policy

"Health is today a growing concern in foreign policy" **– Dr. Margaret Chan**

Health is on the radar of foreign policy since it is connected to three global agendas i.e. security, economy, and social justice. Over the past decade, countries around the world have progressively acknowledged the significance of linking their foreign policy efforts and their work on health. Various events around the globe have contributed to the development of the field of "Health Diplomacy", for instance the increase in global funding to fight HIV/AIDS, the treat of emerging and re-emerging infectious diseases, the need for virulent disease vigilance, fears about bioterrorism, and emerging focus on health system strengthening and universal health coverage.

AS THE 21ST CENTURY CONTINUES TO EMPHASIZE THE NEED FOR SYNCHRONIZED HEALTH ACTIONS BETWEEN NATIONS, THE SIGNIFICANCE OF HEALTH DIPLOMACY HAS BECOME OBVIOUS WITHIN FOREIGN POLICY LOOP.

In recent times, there has been an astonishing surge of interest in the topic of health diplomacy. It is worth noting that, even with this growing level of interest, there is modest accord on how to define health diplomacy. The notion of health diplomacy was introduced as early as 1978 by Peter Bourne, special assistant to the president for health issues during the Jimmy Carter administration. He argued that "the role of health and medicine as a means for bettering international relations has not been fully explored by the United States. Certain

humanitarian issues, especially health, can be the basis for establishing a dialogue and bridging diplomatic barriers because they transcend traditional and more volatile and emotional concerns".

As a developing country, Pakistan has largely been the recipient of various developmental aids from developed countries including that for health and also relied on such assistance to advance domestic health condition. Conversely, with its escalating national power, Pakistan is also anticipated to shoulder responsibilities and to make contributions to many other developing countries of the region, not just in the form of medical teams. As the 21st century continues to emphasize the need for synchronized health actions between nations, the significance of health diplomacy has become obvious within foreign policy loop. Pakistan must have bilateral or multilateral health treaties and agreements with other countries through multi-year action plan, with particular emphasis on health system development, public health, prevention of disease, primary health services and global health.

In the modern globalized world today, health is too important and political to be left only to the ministry of health. Globalization requires that ministers of health act with other countries in order to ensure the health of the residents at home. In this regard the government should:

- Integrate a global health perspective into its general foreign policy and create an information platform for health diplomacy,
- Harmonize general foreign policy and other policies to highlight the health effects of foreign policy, and improve the promotion of public health nationally and globally,

- Establish the coordinating office for health foreign policy to highlight the connection between health and well-being, social development and security,
- Produce policy papers on subjects arising in health foreign policy and strengthen academic proficiency,
- Continue its efforts to strengthen good governance, with emphasis on institutional development and the rule of law,
- And, give priority to fight against corruption and nepotism throughout development and foreign policies, with targeted efforts in the health diplomacy.

It is an eminent fact that health is a global public good and national public health cannot be safeguarded by any state in isolation. Almost all world leaders have committed themselves to ensuring that all individuals enjoy the right to health. They have also agreed to cooperate to realize this right for people all over the world. In Pakistan, foreign policy must take health issues into account, and health issues must have a diplomatic dimension. Foreign policy practitioners need to become aware of impact of policy options and decisions on health outcomes and must back these words with their actions. This is how foreign policy can make a difference to health and this is a task by which they are likely to be judged by future generation.

Published on: 28th March, 2016

Pak-Sino Health Diplomacy: A Novel Paradigm For CPEC Project

The global developments are shifting the nature of human interaction across a wide range of social sphere including the economic, political, cultural, health and environmental. Globalization is driving a world system comprising national economies and societies that are increasingly influenced by factors outside their borders. Contemporary globalization is a driving force behind the rise of health as a foreign policy concern. Currently, many governments are implementing structural and administrative reforms aimed at improving health system performance. Many of these reforms are advocated by international organizations and consequently, the focus tends to concentrate on areas such as financing, management, and structure of health system. Among the major focus of reforms is to ensure quality health care provisions are affordable to all and that health service should be accessible to all.

THE ARCHITECTURE OF HEALTH DIPLOMACY IS PROGRESSIVELY MULTIFACETED IN THE 21ST CENTURY. THE MOUNTING AWARENESS OF THE PROSPECTIVE VALUE OF THE ASSIMILATION OF HEALTH IN FOREIGN POLICY AS A PHENOMENON WORTHY OF FURTHER ATTENTION, PRINCIPALLY IN CPEC.

Historically, Pakistan and China have a multidimensional relationship, providing a good example of peaceful coexistence between two states with differing beliefs, social, cultural, and ever changing geo-political archetypes. China has supported Pakistan economically, militarily and politically, while Pakistan was China's only reliable free world diplomatic partner during its international

isolation. Since its founding in 1949, the People's Republic of China (PRC) has been connecting significance to utilize health as a tool for endorsement of foreign relations, playing different function at different times. Similarly, launched by President Xi Jinping in 2013, the OBOR/BRI vision proposed to push economic integration and connectivity across the three continents of Asia, Africa, and Europe, through the construction of new land and maritime transport infrastructures and the development of pipelines and information networks. This grand vision envisages an overland "Silk Road Economic Belt" across the Eurasian continent and a "Maritime Silk Road" across Southeast Asia and the Indian Ocean. Given its geo-strategic position, Pakistan is ideally poised to serve as interconnection between the two routes; that is the reason the Chinese leadership has acknowledged CPEC as a flagship project in the whole scheme of OBOR/BRI.

Traditionally, health issues have resided in a political position in policy practice, so as having momentous importance in CPEC project. In recent years, certain health issues have received attention at the highest levels of national and international politics. The threats from bioterrorism, infectious diseases, pandemic and epidemic diseases, viruses of special concern and an increasing awareness of the link between health and economic development have each devised a role in relating health to the traditional foreign policy goals of protecting state security and promoting national economic interests. Health and diplomacy are closely linked phenomenon as health is a highly scientific and technical domain and states cannot ignore the epidemiological reality of many health crises, it can be hypothesized that the health research community and scientific research evidence play a powerful influencing role in the development process.

The architecture of health diplomacy is progressively multifaceted in the 21st century. The mounting awareness of the prospective value of the assimilation of health in foreign policy as a phenomenon worthy of further attention, principally in the CPEC. The geo-strategic corridor is beneficial not only for Pak-Sino relations but also, for the regional development that will eventually benefit all neighboring countries. In this regard the government of Pakistan, health and foreign policy planners may perform the following roles:

- Integrate a health perspective into traditional foreign policy and create an information platform for Pak-Sino Health Diplomacy.
- Establish the coordinating office for Health Diplomacy to highlight the connection between health and well-being, social and economic development.
- Utilize science and technology, and health personnel in diplomatic activities/missions and promote strategic joint research and development with China and regional countries with high diplomatic importance.
- And, exhibit good moral character; exceptionally give priority to fight against corruption and nepotism throughout not only CPEC development but also, society as-a-whole.

Pakistan's location at the cusp of Central Asia, South Asia, and West Asia makes it ideally suited for inter-regional trade. The infrastructures developed under the CPEC will not only facilitate Pakistan but also China, to accomplish the dream of becoming a regional and global trading, diplomatic and health tourism nuclei. Once the projects are put into practice, Pakistan's geo-strategic location should make it a potential nexus for the Eurasian "Silk Road Economic Belt" and a Southeast Asian "Maritime Silk Road". The

CPEC could then not only serve as a game changer for China and Pakistan, but also for the entire region.

Published on: 23rd December, 2017

"Disease Diplomacy" – Post 2019-nCoV, Call To Action For Pakistan!

After decade of neglect, infectious diseases (IDs) have re-emerged as a field of inquiry in the area of international public health and international health security. Gradually, the world is realizing the threat of emerging IDs after the 2019-nCoV outbreak in China. However, human history is abundant with stories of epidemic infections. Epidemiologically, IDs tend to follow a cyclical pattern, since they often produce immunity in survivors, and microbes await a new generation of hosts to infect. On the other hand, the disease-causing viruses or microorganisms migrate to geographically distant and immunologically vulnerable inhabitants, producing a pandemic, or regional and global outbreak. The historical relationship between the humanity and IDs is fascinating and noteworthy. IDs plagued civilizations long before the development of territorial states during the European Renaissance. Subsequently, epidemic diseases shaped human history, generally, and military conflict, in particular. During the Peloponnesian Wars, disease demoralized the Athenian people, weakened the army, and undermined the political leadership. Subsequently, more than 2,500 years later, the 1918 influenza epidemic killed 25 million people, including 500,000 Americans. The Spanish flu struck 294,000 allied

RELATIONSHIP BETWEEN PAKISTAN AND CHINA MAY FURTHER CEMENTED INTO HIGHER LEVEL OF STRATEGIC PARTNERSHIP WITH A UNIFIED VISION OF SHARED FUTURE FOR THE REGIONAL PEACE, PROGRESS AND STABILITY, IF BOTH COUNTRIES WILL HAVE BILATERAL HEALTH TREATIES AND AGREEMENTS.

troops in the fall of 1918. By the time Spanish flu, the pandemic had infected more than a quarter of the world's population. Moreover, the 1918 flu pandemic killed 50-100 million, which is more than the combined total casualties of World War I and II.

Until the early twentieth century, plague, smallpox, influenza, and other scourges decimated human populations around the world. Despite exceptional improvement in pandemic control, IDs remain a major threat to global public health. In 1998, 13.3 of the 53.9 million deaths worldwide, or 25 percent of all death, resulted from IDs. Historically, some major disease outbreaks in China, including the 1957 Asian flu, the 1968 Hong Kong flu, and the 2002/03 SARS (Severe Acute Respiratory Syndrome) epidemic, have triggered epidemics elsewhere in the world, killed approximately 800 people around the world. In total, SARS infected more than 8,000 people in 26 countries. As demonstrated in the SARS epidemic, the new strain of coronavirus (2019-nCoV), which causes a type of pneumonia that has not previously been identified in humans, resulting spillover of disease outbreaks in China and around the world.

The 2019/20 novel coronavirus outbreak, also known as the Chinese pneumonia outbreak or the Wuhan coronavirus, is a viral outbreak that was initially identified during mid-December 2019. Chinese authorities identified the new coronavirus has resulted approximately 3000 confirmed cases in 17 provincial-level regions in country, and additional cases being identified in a growing number of countries internationally. On January 21, and 25, 2020, the first cases in the United States and Canada were also announced, respectively. Confirmed cases have also been reported in 11 countries, including, Japan, Thailand, South Korea, Nepal, Malaysia and Singapore. As of January 27, 2020, around 80 deaths have occurred all in China and 92 patients were also recovered. Conversely, ID threats, and the fear and

panic that may accompany them, leads to various economic and social risks. With respect to outbreaks and epidemics, there are obvious costs to the health system in terms of medical treatment and outbreak control. ID outbreaks pose additional social risks beyond economic threats. IDs outbreaks have the potential to induce geopolitical instability. Thus, 2019-nCoV may not only have serious implications on stability, prosperity, and health security at the regional, but also global level.

The fact that ID outbreaks have more reach in our increasingly globalized world. In the age of globalized trade and air travel, diseases that once took months or even years to spread beyond their regions of origin can now migrate or travel around the globe in a matter of hours. With growing concerns about such IDs, "Disease Diplomacy" has emerged as a key foreign and health security policy concern. The term relates in particular to IDs issues and determinants that cross national boundaries. As the 21st century continues to emphasize the need for synchronized health actions between nations, the significance of disease diplomacy should be an important component within the foreign policy of Pakistan. Pakistan's location at the cusp of Central Asia and South Asia makes it ideally suited for inter-regional connections. Moreover, geostrategic location makes Pakistan a nexus for the Eurasian Silk Road Economic Belt, and Southeast Asian Maritime Road.

Apparently, relationship between Pakistan and China may further cemented into higher level of strategic partnership with a unified vision of shared future for the regional peace, progress and stability, if both countries will have bilateral health treaties and agreements. With particular emphasis on health system development, regional and international public health, infectious disease detection and control, and international health security. Similarly, after the 2019-nCoV

outbreak, Pakistan is also at high risk of epidemics due to communicable diseases because of poor socioeconomic conditions, low health awareness, inadequate sanitation, unsafe drinking-water, and overcrowded cities. In Pakistan, as a matter of fact, due to socioeconomic, environmental, corruption and bad health governance, communicable diseases still remain a major public health concern and prime cause of morbidity and mortality. Pakistan also bears a significant portion of the regional burden of many communicable diseases that pose a significant threat to regional and international health security.

The recent 2019-nCoV outbreak necessitate the regional collaboration is of paramount importance. Many diseases with epidemic potential may be transmitted rapidly, within and across both countries. The effectiveness of future policies to deal with IDs in the region will only be assured if policies are based on evidence. In Pakistan, there is a great desire to know what the future of IDs will bring, and also to know how we should behave in the future. Now is the high time to realize that we are in darkness than to pretend that we can see the light. Nevertheless, the following recommendations are put forwarded for CPEC Authority, primarily, Government of Pakistan (GoP), health and foreign policy planners, principally.

- Integrate a health and infectious diseases perspective into traditional foreign policy and create information platform for disease diplomacy.
- Establish the coordinating office for disease diplomacy to highlight the connection between health, well-being and socioeconomic development.
- Harmonize general foreign policy to highlight the health issues for diplomacy, and utilize the disease diplomacy for regional and international health security.

- Utilize science and technology, and health personnel in diplomatic activities/missions and produce policy papers on subjects arising in disease diplomacy and strengthen diplomatic proficiency,
- Government must get its own house in order, continue its efforts to strengthen good governance with emphasis on merit-based institutional development and rule of law.
- And, exhibit good moral character; exceptionally give priority to fight against nepotism and corruption throughout not only CPEC development but also, society as-a-whole. Eventually, CPEC Authority must be chaired by an honorable civilian (maybe economist) rather than retired military general. However, a separate security domain may be constitute under CPEC Authority that may be headed by military general.

Published on: 29th January, 2020

Technopolitika: Pak-Sino R&D Cooperation Via CPEC

Throughout history, integration between different regions has been a key element in enhancing economic activity and trade. This cooperation has long been facilitated by the diverse means of research and development (R&D) and technology innovations, such as railways, roads, and water & power systems etc. Technological innovation not only widened the possibilities of cultural and economic exchange, but also facilitated and fastened such interactions, promoting cooperation and setting up the bases for the globalized world in which we live today. Similarly, infrastructure investment is one of the main pillars of economic growth. It peps economic activity, generating employment and reducing trade costs, improves productivity and directly supports growth in different sectors in the economy.

In 2013, the President of China, Xi Jinping, announced one of the main projects of its foreign policy – the One Belt, One Road (OBOR) the major global Belt and Road Initiative (BRI). This ambitious plan seeks to promote regional integration and cooperation through the resignification of the Old Silk Road. OBOR/BRI pursues the development of an economic corridor across Eurasia, by mitigating the infrastructure gap that haunts the continent. The scope of the project, which includes more than 60 countries and guarantees great expenditures, shows up as a turning

CPEC IS A PROJECT OF MAJOR IMPORTANCE; IT IS ONE WHICH HAS ENOUGH WORTH TO HERALD THE ECONOMICS OF TWO NATIONS IN PARTICULAR AND THE DEVELOPMENT OF WHOLE SOUTH ASIA IN GENERAL.

point in today's world economic order. Pakistan and China, as the core player in this scenario, progressively becoming the new economic gravitational hubs, escalating its influence in the global politics and ascertaining tighter relations among other nations.

Pakistan enjoys a unique geographical landscape situated at the cross-roads in South Asia, considered as one of the vibrant geostrategic region of the world. In South Asia, there is exceptional Chinese cooperation with Pakistan. China and Pakistan as all-weather strategic partners have a history of glorious friendly relations. Both countries always try to make strong these relations through different geo-political, strategic and economic agreements. The Pak-China Economic Corridor (CPEC) is also a key to make strong economic relations of both countries. It is considered to be an extension of China's proposed 21st century Silk Road initiative and considered a centre for their relations. CPEC long-term project as a major part of the OBOR the global Belt and Road Initiative (BRI) by the Chinese government, scheduled to complete by 2030. CPEC is a joint project that Beijing and Islamabad agreed to finance through Chinese investments. Pakistan sees China's initiative as a peace and prosperity developer, and the CPEC as a strengthening to the regional economy. While the project has been welcomed by Greater Eurasia (including Russia, Iran and Central Asia), besides the United Kingdom and Western European Countries. Similarly, for Iran, the OBOR will help to fight its geopolitical isolation from the Western world order. Sri Lanka is also a fundamental station on the Maritime Silk Road, looking at China as an opportunity to distance itself from Western and Indian dependence.

Correspondingly, China's development is part of an elementary transformation of the global distribution of knowledge capital. State-of-the-art technology and world-class scientists are no longer the

prerogative of the developed world. Developing countries are claiming increasing shares not only of world trade, manufacturing, and raw material consumption but also of global knowledge resources, both with regard to highly skilled labor and to corporate R&D. China is enthusiastically competing for these resources. The latest long-term plan reflects Beijing's desire to address growing domestic social and S&T innovation problems through R&D and to become one of the world's knowledge hub. China's emergence as a magnet and now even producer of frontier-level science and high technology demands other countries, particularly Pakistan, to formulate education, research, innovation, and development strategies from the scratch. Though facing substantial challenges in its quest to become a world leader in science, technology and innovation, China offers momentous opportunities both for mutually beneficial cooperation in R&D and for trade of knowledge intensive goods and services. China's opening to the world, prioritization of science and technology, research and development, education and innovation, and desire to acquire knowledge and technology may offer imperative opportunities and vehicles for the CPEC project to institutionalized cooperation on issues of R&D and global relevance.

In a nutshell, CPEC is a project of major importance; it is one which has enough worth to herald the economics of two nations in particular and the development of whole South Asia in general. Slowly and gradually, China is becoming a global leader in science and technology. China's ambitions to become a global knowledge center could be an optimistic development providing opportunities by working with China, both bilaterally and within international forums (China-ASEAN Science and Technology Partnership Program), the fields of science and technology, research and development, brought under CPEC, can truly prove to be a game-changer for Pakistan.

India's Space Diplomacy In 2017: Where Pakistan Is Standing?

"Scientific thought and its creation is the common and shared heritage of mankind." **– Prof. Dr. Abdus Salam**

The year is 1961 in history, Soviet cosmonaut Yuri Gagarin, became the first human to journey into outer space. A charismatic 35th President of United States – John F. Kennedy has taken oath and announces his goal to initiate a project to put "man on the moon" – Apollo program. Something similarly historic is happening in Pakistan, where globally renowned physicist Nobel Laureate Prof. Dr. Abdus Salam is convincing President of Pakistan Field Marshal Mohammad Ayub Khan to set up a first space agency in the subcontinent. In September that year, Prof. Salam set up the Space and Upper Atmosphere Research Commission (SUPARCO) headquartered in Karachi. In 1962, SUPARCO with the help from NASA launches its first rocket, Rehbar I, from Karachi shoreline and becomes the third Asian country to launch rockets after Israel and Japan. But despite its head start, the SUPARCO today is decades behind the Indian Space Research Organization (ISRO) in both mission accomplishment and scientific and technical expertise. On 15th Feb, 2017 ISRO broke a world record by sending 104 mini satellites to space with a single

WE ARE WITNESSING A FUNDAMENTAL SHIFT IN HOW NATIONS MANAGE THEIR INTERNATIONAL RELATIONS – BEYOND CLASSIC DIPLOMACY.

PAKISTAN SHOULD PROLONG ITS EFFORTS IN SPREADING ITS SPACE DIPLOMATIC TENTACLES TO ACHIEVE PAKISTAN'S SPACE VISION 2040.

rocket. India is also scheduling to reach Venus and revisit Mars by 2040 – on the contrary, Pakistan has had five satellites in space but, today lacks heavy duty launchers and satellite fabrication facilities and SUPARCO is not predictable to have home-produced satellite launching and producing technology for at least two decades.

What happened to the subcontinent's oldest space agency? The answer is as clear as day – government apathy, poor education funding, corruption and bad governance. The real fall comes in the 1980s when President Zia-ul-Haq cuts off funding to major projects, including the flagship satellite communication launch. Then, military generals are placed atop the organization, replacing scientists and the focus of the SUPARCO becomes countering India, rather than sovereign explore and investigation. Conversely, ISRO launched its first communication satellite and started technology sharing programs with several countries and unveiled a remote sensing satellite system that is now the largest in the world. The agency also successfully attracted national talent, helped by its autonomy, sovereignty and scientists at the apex.

Although India's space policy concentrates very much on civil space purpose, it did not show strong interests in playing a leading role in regional space cooperation until the recent years. In terms of bilateral cooperation, it freshly presented space-based services to the developing countries to meet diplomatic needs. India has lunched satellites for countries that do not have space launch capabilities. Recently, India has taken excellent steps towards utilization of space diplomacy and reaching out to the neighbors with the expertise in space related technologies and space diplomacy has become an innovative and vibrant mantra of the current government. The SAARC satellite may be considered as an excellent example of the Indian foreign policy to strengthening relations with the neighbors.

The modular goal of SAARC satellite is to help South Asian countries for scientific advancement, fighting poverty and illiteracy.

On 5th May, 2017 the space became a stratospheric podium for diplomatic relations with the launch of India's South Asia Satellite, funded entirely by India. The South Asia Satellite weighs 2,230 KG and is carrying 12 top-of-line communication transponders, making it India's most momentous space project. According to the ISRO official documents, the South Asia Satellite will "enable a full range of applications and services to our neighbors in the areas of telecommunication and broadcasting applications viz. DTH, very small aperture terminals (VSATs), tele-education, telemedicine & e-Health and disaster management support". The satellite also has the potential to offer secure hot lines among the participating nations, additionally, since the South Asia region is enormously prone to earthquakes, cyclones, floods, tsunamis, it may help in providing critical communication links in times of natural disasters.

Just after the successful launch of ISRO most powerful Indian-made rocket on 5th June, 2017 GSLV Mk III, the space agency launched 712-kg Cartosat-2 series satellite on 23rd June, 2017 which was carried by India's Polar Satellite Launch Vehicle (PSLV-C38). Indian PSLV crowned with 31 satellites from 15 developing and developed countries, including Austria, Belgium, Latvia, Lithuania and Slovakia. According to ISRO official credentials, "The imagery sent by the satellite will be useful for cartographic applications, urban and rural applications, coastal land use and regulation, utility management like road network monitoring, water distribution, creation of land use maps, precision study, change detection to bring out geographical and manmade features, and various other Land Information System (LIS) and Geographic Information System (GIS) application."

We are witnessing a fundamental shift in how nations manage their international relations - beyond the classic diplomacy. We are entering in a new world in which knowledge, science and technology, and diplomacy are the key, not only to technological progress and economic prosperity but also, to social cohesion and sustainable development. Technological capabilities in outer space have long been used as an effective tool of foreign policy. The space technologies are playing a vital function in both enhancing productivity in business & economy and facilitating the sociopolitical progress. Pakistan also needs to expand into space diplomacy dynamically as an instrument to expand Pakistani diplomatic influence and soft power projection plus its geo-political and geo-strategic interests. Science and Technology capacity-based diplomacy may very well hold the key to deepening relationships both regionally and internationally for Pakistan. SUPARCO currently administrated by Major General Qaiser Anees Khurram with Rs. 3,500 million (FY 2017-18 budget) must effectively use Pakistan's space dexterity as a tool in diplomacy and foreign policy not only for regional capacity building and collaboration with developing and developed nations but also for enhancing Pakistan's role in global framework. Consequently, Pakistan should prolong its efforts in spreading its space diplomatic tentacles to achieve Pakistan's Space Vision 2040.

Published on: 19th July, 2017

Chandrayaan-2 Was Really A Failure, But For Whom?

Before leaving Pakistan I had written an article "India's Space Diplomacy in 2017: Where Pakistan Is Standing?" In that article I highlighted the fundamental shift in how nations manage their international relations beyond the classic diplomacy and the attitude of Indian government/ISRO for technological capabilities in outer space as an effective tool of foreign policy. Additionally, I also compared the SUPARCO (subcontinent's oldest space agency) with ISRO in term of satellite launching and producing technology and how the focus of SUPARCO became countering India, rather than explore and investigation, research and development. That attempt was not only to draw attention towards the use of space dexterity to expand diplomatic influence to achieve Pakistan Space Vision 2040, but also soft power projection. Surprisingly, I received mixed comments from fellows and readers in the context of "patriotism".

> *"SCIENTIFIC THOUGHT AND ITS CREATION IS THE COMMON AND SHARED HERITAGE OF MANKIND". – ABDUS SALAM*
>
> *"THE OBJECTIVE OF CHANDRAYAAN-2 WILL BE SOLVED BY CHANDRAYAAN-3."*

The core motive to pen-down this artifact "Chandrayaan-2 was really a failure, but for whom?" is to highlight the quote of Prof. Dr. Abdus Salam *"Scientific thought and its creation is the common and shared heritage of mankind"*. Let's have a look on Chandrayaan-2 – Chandrayaan-2 was an Indian lunar mission that was supposed to go where no country has ever gone before (the Moon's South Polar Region). According to ISRO official credentials, *"this mission will help*

us gain a better understanding of the origin and evolution of the Moon by conducting detailed topographical studies, comprehensive mineralogical analyses, and host of other experiments on the lunar surface. While there, we will also explore discoveries made by Chandrayaan-1, such as the presence of water molecules on the Moon and new rock types with unique chemical composition. Through this mission, we aim to: (1) expand India's foot print in space; (2) inspire a future generation of scientists, engineers, and explorers; (3) surpass international aspirations".

Launched on 22 July 2019 from Satish Dhawan Space Center on Sriharikota Island on an ISRO Geosynchronous Satellite Launch Vehicle (GSLV) Mark III. The lander-orbiter pair went into an initial elliptical, earth parking orbit, followed by a translunar injection on 14th August. The pair entered lunar polar orbit on 20th August. Subsequently, the lander and orbiter separated on the 2nd September. The orbiter evolved into a circular polar orbit and the Vikram lander maneuvered into orbit with a plan to land on the surface in the high latitude areas near the South Pole. On 7th September contact was lost during the descent at an altitude of approximately 2 KM. The ISRO officials said that the spacecraft stopped communicating with Earth when it was within 1.3 miles of the lunar surface. Though contact with the Vikram lander was lost, the orbiter going around the moon and will carry out experiments over the next year.

On the eve of 7th September, several scientist, technologist and general public were eagerly waiting for the Vikram lander to land on the Moon's South Polar Region. Even though, the communication between the orbiter and lander was lost, ISRO, Indian scientists and engineers received appreciation and support for their efforts around the globe. Gauhar Raza, an Indian scientist, Urdu poet and social activist said, *"The objective of the Chandrayaan-2 will be solved by*

Chandrayaan-3. A lot of lessons has been learnt this time and we will definitely master the technology of the lander in the coming future".

Published on: 12th September, 2019

‘War On Corruption’ – The Anti-Corruption Cooperation In SAARC Countries!

The South Asian Association for Regional Cooperation (SAARC) was formed in December 1985 with seven member states: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri-Lanka. Whereas, Afghanistan became the eight member in 2007. SAARC is the regional organization at the government level for the 8 member countries to delineate their differences and promote welfare of the people, improve quality of their life and accelerate economic growth. Since its establishment, SAARC is focused on promoting economic cooperation and growth, mutual assistance in the social, cultural, technical & scientific fields, and the rule of law. SAARC ultimately aims to provide a platform for cooperation and dialogue among the governments of South Asia. Since, South Asia is at a crossroads powered by the vibrant development and fastest-growing region in the world and it can be squeezed faster to find its equitable place in the world. If its member states develop as an incorporated economy this would make South Asia the second-largest economy in the world.

SAARC HAS MADE SIGNIFICANT PROGRESS IN IMPROVING SOCIO-ECONOMIC DEVELOPMENT AND SCIENTIFIC & TECHNOLOGICAL COORDINATION IN SOUTH ASIA. IT IS NOW TIME FOR IT TO SHIFT ITS FOCUS TO OTHER, LONG-STANDING POLITICAL, GOOD GOVERNANCE AND ANTI-CORRUPTION CONCERNS.

On the contrary, no country is free from the threat of instability whether caused by terrorism, economic-terrorism, bad governance and regional security. Similarly, problems such as corruption,

backwardness, poverty, illiteracy, high rate of crime, etc, create sagacity of insecurity among all the member states of South Asia. There have been moments of significant coming together among SAARC states on rule of law issues, particularly drug trafficking, anti-terrorism, anti-corruption, cyber-crime, which are major security challenges for South Asia. South Asian countries do not only rank ill in governance standards but also, poor infrastructure together with defensive policies, corruption and red tape, are key barrier that impede the economic growth of these countries. Even though they have individually launched programs to fight corruption and improve public sector and governance but, every day stories covering issues of corruption appear in South Asian print and electronic media telling stories of corruption, corrupt officials, money laundering, and abuse of power – crimes that propagate political and regional instability.

In recent times, a strong global consensus has emerged that addressing corruption and building good governance is essential for the development of people and economic prosperity of any country or region. Despite the fact, SAARC faces severe challenges in bonding such a diverse region with different political, social and religious traditions. Regardless of lack of common grounds, it is crucial that SAARC countries put aside their difference and work to fabricate common solutions to the problems they are facing in their economic and regional development, as well as rule of law and menace of corruption. The 19th South Asian Association for Regional Cooperation (SAARC) summit will be held in Islamabad, Pakistan in November, 2016. While speaking at a conference of the States Parties to the United Nations Convention Against Corruption (UNCAC), in Saint Petersburg, Russia, Chairman National Accountability Bureau (NAB) Pakistan, Qamar Zaman Chaudhry said that a regional conference of SAARC member countries on anti-corruption will be hosted by Pakistan to promote bilateral and regional cooperation on

anti-corruption issues. In view of the desire of the government of Pakistan the following steps are recommended as the way forward for SAARC countries to combat corruption in the region;

- Governments of SAARC countries should have a zero tolerance for corruption and money laundering in their countries.
- Governments of SAARC countries should educate and involve citizens in building integrity to prevent corruption. Punish the corrupt and support those who have suffered from institutional corruption.
- Governments of SAARC countries should conduct public-education and awareness-raising activities, integrity-building workshops, and other cross-border events to eradicate corruption and poverty.
- Governments of SAARC countries should reform the justice systems by ensuring very stiff and stricter penalties for people found guilty of corrupt practices.
- Governments of SAARC countries should establish a closer link and develop a network of dedicated individuals committed to the objective of ending corruption.
- Governments of SAARC countries should apply the principle of consensus in the allocation of natural resources to prevent regional conflict and use dialogue as a tool of settling regional problems such as insecurity, insurgency, corruption and poverty.

In a nutshell, SAARC has made significant progress in improving socio-economic development and scientific & technological coordination in South Asia. It is now time for it to shift its focus to other, long-standing political, good governance and anti-corruption concerns. SAARC should therefore play an important role in helping

member state governments meet their citizens' demands; this action would contribute to building regional peace, stability and economic prosperity.

Published on: 4th June, 2016

Governance

Freedom Of Information And e-Governance

Freedom of information is an internationally recognized human right. In 1946, the United Nations General Assembly recognized that "Freedom of Information is a fundamental human right and the touchstone for all freedoms to which the United Nations is consecrated". Consequently, the right to information was referred to in two key international human rights instruments: the 1948 UN Universal Declaration of Human Rights and the International Covenant on Civil and Political Rights of 1966, which came into force in 1978.

Article 19 of the Universal Declaration of Human Rights (1948) defines the right to access information in the following terms:

"Everyone Has The Right To Freedom Of Opinion And Expression: The Right Includes Freedom To Hold Opinions Without Interference And To Seek, Receive And Impart Information And Ideas Through Any Media And Regardless Of Frontiers".

Pakistan was the first country in South Asia to frame a law on freedom of information, when it promulgated the Freedom of Information Ordinance in 1997 through a presidential order. The Constitution of Pakistan expressly gives a right of access to information, Article 19 states:

"Every citizen shall have the right to freedom of speech and expression, and there shall be freedom of the press, subject to any reasonable restrictions imposed by law in the interest of the glory of Islam or the integrity, security or defense of Pakistan or any part thereof, friendly relations with foreign states, public order, decency or morality, or in relation to contempt of court, commission or incitement to an offence".

The term e-government is of recent origin and there exists no standard definition since the conceptual understanding is still

evolving. The generally accepted definition is: "e-government" or electronic government refers to the use of Information and Communication Technologies (ICTs) by government agencies for any or all of the following reasons:

i. Exchange of information with citizens, business or other government departments
ii. Speedier and more efficient delivery of public services
iii. Improving internal efficiency
iv. Reducing costs or increasing revenue
v. Re-structuring of administrative processes

The essence of e-Government can be summarized as: *"The enhanced value for stakeholders through transformation"*. Conventional delivery systems will continue to be important given the restricted coverage though internet, limited spread of education, lack of infrastructure like power etc. There is widespread societal bureaucratic routine, paperwork, procedures and delays, over-centralization, systematic rigidities and poor service to maintain systemic viability in the face of global competition. Technology impacts the way work is organized and how employees work. Not all the existing processes add value and still remain valid.

ICT offers an opportunity for improvement in public service delivery and most administrative best practices build upon the process redesign and convergence the ICT facilitates. ICT leads to a transformation in work processes and service delivery, lowers transaction cost with improvement in transparency and accountability. It enables transformational change rather than merely technical change. E-Government information systems should not mean electronic reproduction of existing institutional patterns and relations, and the same patterns of inter-department co-operation.

ICT enabled E-Governance models and best practices enable integration of Government processes and communication with access enabled across space and time on an on-line real time basis, with status tracking and status information. Integrated user group interface through ICT platforms help provide minimal public interface for time bound delivery of services with reduction in delay and corruption, improved transparency and help bridge the performance gap.

The integration of back-end services and transformation of process design for basic service delivery linked to organizational level restructuring is at the heart of the transformation. It is also important to integrate Government services with inter-operable standards with convergence across departments breaking up the silos and duplication of meta-data and processes and divisions between the technical/operational side and between field and secretariat. Architectural change of organizations is also part of this transformation. The concept of networking of organizations and information systems, with public administration functioning on a networked horizontal structural base, marking a departure from hierarchical command structures is the future administrative roadmap.

Having access to information plays a key role in efforts to curb corruption and control its impact. By facilitating such access and making more information related to the operations of the public sector available in the public domain, the Government should introduces greater transparency and accountability, which in turn help curb corruption… Ensuring access to information is therefore a fundamental requirement for establishing an effective system of national integrity.

Published on: 6th February, 2012

ICT For Sustainable Democracy And Good Governance

"The Constitution is not an instrument for the government to restrain the people; it is an instrument for the people to restrain the government – lest it come to dominate our lives and interests." **– Patrick Henry**

Throughout the last three or four decades, the storm of democratic movements and reforms has blown around the world, and democratic decentralization has extended globally. In all continents, most governments have embraced decentralization programmes. The United Nations has taken an important role in reconceptualizing governance. In the UN's archetype, governance is defined as "*the exercise of political, economic, and administrative authority to manage a nation's affairs. It is the complex mechanisms, processes, relationships and institutions through which citizens and groups articulate their interest, exercise their rights and obligations and mediate their differences*". (Reconceptualizing Governance, Discussion Paper No. 2. New York: UNDP).

In the 21st century democracy goes beyond the rule of law and the protection of human rights and it means more than good governance and the effective management of public resources. Descriptions of democracy differ and evolve time to time. Democracy is about the use of power and the management of conflict. It requires a set of political institutions and processes based on the principle of popular control over

IN DEMOCRACY, THE STATE IS THE SERVANT OF THE PEOPLE. IT EXECUTES MANY FUNCTIONS ESSENTIAL FOR THE WELLBEING AND DEVELOPMENT OF ITS CITIZENS AND PROVIDES AN ARRAY OF ESSENTIAL SERVICES.

public decisions and decision makers, and equality of respect and voice between citizens in the exercise of that control. Moreover, the quality of democracy vary according to how well the institutions allow for these two principles to be given practical expression, which can be done through processes of participation, representation, accountability, transparency and responsiveness to the citizens. Such practice imply a culture of participation, in which media, an active civil society, competing political particles and other mechanisms allow all citizens to acquire political voice.

A better informed and active community, who can put pressure on national institutions to be accountable and responsive to citizens' need and priorities, is a fundamental component of a functioning democracy. Information and Communication Technology (ICT) is now able to support democracy and human rights by facilitating and intensifying citizens' social mobilization. In developed countries the search for better governance was driven primarily by the concern that governments were ineffective, expensive, inflexible, and insufficiently responsive to the needs of citizens. Even though all these impediments, governments have, in varying degrees, enthusiastically responded to the adoption of ICT in both bringing the government to the people and in cutting the costs and time frame of service delivery. Recent world-wide crisis events have drawn new attention to the role of information and communication technology (ICT) to play warning and rejoinder activities. In developed countries two decades ago only a handful of governments offered services via the internet but now there is hardly any government that does not have some form of internet connectivity to service delivery.

ICT has also led to the accomplishment of other enviable objectives. First, there is greater pressure on government to become more transparent and ICT provides them with an easy way of doing that.

More and more governments are making information, accounts, White Papers, government reports, and parliamentary discussions available on-line to keep citizens informed. In developed countries, the government posts the expense reports of elected officials for public analysis and inspection. In India, ICT has provided an accidental but easy way of exposing government corruption. ICT is also being used ingeniously and beneficially to engage citizens in government discussion. On the other side, citizens have also set up websites/blogs to inform people and organize public opinion regarding specific issues and successfully brought pressures on governments to modify their policies.

In democracy, the State is the servant of the people. It executes many functions essential for the wellbeing and development of its citizens and provides an array of essential services. ICT makes it possible for government and citizens to connect each other and to introduce government transparency and accountability, thus giving citizens the ability to participate in way that make representative democracy more effective and accessible. In the 21st century and in the age of information technology government must be efficient, effective, participative, honest, transparent, professional, responsive, and collaborative if they desire to achieve the goals of socially equitable economic growth and sustainable human development. The Government of Pakistan must not only play a critical role in the development of the on-line world but also need to incorporate and adapt policies and technologies that will expand participatory democracy.

Published on: 1st February, 2013

Towards Re-Inventing Good Governance

"Good Governance is perhaps the single most important factor in eradicating poverty and promoting development" **– Kofi Annan**

It is not complicated for people in developed countries to envisage a situation in which all interaction with government could be done through one counter 24 hours a day, 7 days a week, without waiting in lines. Conversely, to achieve this same level of efficiency and flexibility for developing countries is going to be far more complicated. Experience in developed countries confirms that this would be feasible if governments are willing to decentralize responsibilities and processes, and if they start to use electronic means. Each citizen could then contact the government through a website where all forms, legislation, news and other information available. The use of electronic means (ICTs) in government procedures facilitates speedy, transparent, accountable, efficient and effective interaction with the public, citizens, business and the other agencies.

E-GOVERNMENT IS ABOUT TRANSFORMING THE WAY GOVERNMENT ACT TOGETHER WITH THE GOVERNED. THE PRACTICE IS NEITHER QUICK NOR SIMPLE. IT REQUIRES A COHERENT STRATEGY, BEGINNING WITH AN EXAMINATION OF THE NATION'S POLITICAL WILL.

Good governance refers to the question of how a society can organize itself to ensure quality of opportunity and equity (social and economic justice) for all citizens. Moralities at the heart of good governance are participation, pluralism, transparency, accountability, equity, access, partnership, and efficiency. The essence of public administration as a democratic institution is to use the principles of good democratic

governance to design and structure state institutes, their internal processes and mechanisms, and their mission. Simply stated, it implies that public administration as a democratic institution has the following characteristics:

- It is accountable and transparent;
- It is decentralized;
- It is based on a system of check and balance between the executive branch and the parliament;
- It has adequate management capacity to enhance access to justice;
- It utilizes the power of information and communication technology to promote citizens' access and participation in the development process;
- It promotes and strengthens partnerships of various types to achieve objectives.

e-Government is a powerful means for secretarial and governance reform. Whenever e-government projects/programs are being formulated or are going to be launched, opportunities and ways for transforming the existing administrative structure must be studied. The success of e-government initiatives depends on how well they are planned and implemented. Although the basis for e-government development, such as e-government readiness, infrastructure, and business processes may very country to country, the ultimate goal of e-government is more or less the same. Moreover, it is not crucial to follow blindly what other countries are doing with respect to e-government development.

e-Government is about transforming the way government act together with the governed. The practice is neither quick nor simple. It requires a coherent strategy, beginning with an examination of the nation's political will, resources, regulatory environment, and ability of the

population to make use of planned technologies. Global experience point out that there are three types of reimbursement or returns that can be achieved from e-government expansion such as economic, social, and benefits of government.

e-Government is a solution that can realistically modernize the process of governance itself. Therefore, government leaders planning e-government projects should first examine the function or operation to which they want to apply. E-government requires strong political leadership in order to succeed. Strong leadership can ensure the long-term commitment of resources and expertise and the cooperation of disparate factions. The success of e-government requires necessarily changing how government works and how people view the way in which government helps them. There is no "one size fits all" strategy in implementing e-government. In order to realize efficiencies, moreover, governments must develop a citizen-centric model that involves key stakeholders outside of government. Without citizens input, e-government projects are unlikely to succeed, because if citizens will not use system that does not respond to their needs as the concept of e-government revolves around the citizen. In order to develop this citizen-focused vision, policymakers must keep the ordinary citizens in mind as e-government is not just a cost cutting or efficiency initiative, but rather is directed at bettering the lives of ordinary people.

Published on: 6th August, 2014

Rethinking GIS To Enhance e-Government Services

The World Summit on the Information Society declared in the Geneva 2003 Plan of Action that all countries should aim *"to connect all local and central government departments and establish websites and email address"*. The routine business of every government is built on information and information is an important resource that helps to ensure the accountability of government, enables governments to control its operations, and permits the public to contribute in the governance of their country. With the innovatory changes that ICTs are bringing to our global society, governments worldwide continue to widen more refined ways to digitize its routines and practices so that they can offer the public access to government services in more effective and efficient ways. Under the right state of affairs, ICTs offer governments an affective resource to serve citizens and other stakeholders through electronic-government (e-Government) strategies in very stimulating ways. Governments worldwide are integrating computer-based technologies into the centerfold of public administrative reforms to digitize the delivery of services and the practice of governing.

GIS IS USED IN AN EXTENSIVE RANGE OF PUBLIC SECTOR APPLICATIONS INCLUDING, LAND USE AND URBAN GROWTH PLANNING, LEGISLATIVE DISTRICTING, CONSERVATION, BENCHMARKING HUMAN SERVICES, EMERGENCY MANAGEMENT, ENVIRONMENTAL MONITORING, HUMANITARIAN RELIEF, NATURAL DISASTERS AND PUBLIC INFORMATION SERVICES.

Since governments in developed and developing countries are making choices to pursue public administration reforms, many are using ICTs to offer e-government services. The e-government is the centerpiece of information system-supported reforms to digitize the delivery of services and process of governance taking place across all levels of government. As information is a valuable national resource it provides the public with knowledge of the government, society, and economy – past, present and future. The free flow of information between the government and the public is fundamental to democratic society because it is a means to ensure the accountability of government, to manage the governments operations, to maintain the healthy performance of economy.

There are different types of e-government based on using ICT to facilitate relationships between government and other key stakeholders. The types of relationships are with citizens (G2C – Government-to-Citizen), business (G2B – Government-to-Business), and employees (G2E – Government-to-Employees). Firstly, the G2C focuses on making information available to citizens online. This is referred to as a citizen-centric e-government when governments take further steps to provide online services organized around citizen needs.

An interconnected government-to-citizen relationship is when the citizen is also interacting with government as a political actor and participant in democratic process. Secondly, G2B focuses on strategies via ICTs to assist government interactions with the private sector to procure goods and services and to coordinate transactions from private companies. One approach is known as electronic procurement (e-procurement) as the abundance of purchases that government make from the private sector; there is a need to develop faster and more cost-effective practice to grip the typical procedures for

procurement. The typical tasks include: material planning, sourcing, purchasing and contract management.

Finally, the G2E focuses on relationships with government among employees to coordinate internal operations and improve the internal efficiency of business processes. This includes activities to coordinate stakeholders from the national, provincial, and local government as in the case of humanitarian or crisis response.

Computerized mapping technologies acknowledged as geographic information systems (GIS) are giving government innovative tools to sustain the delivery of services to the public. GIS belongs to a family of ICTs that are particularly designed to link information to a geographic location. By using GIS, users can view information on digital maps organized by political and administrative boundaries and even by neighborhoods, cities, rural areas, regions and countries. GIS gives users powerful functions to display, query, and manipulate the data. For example, GIS is widely used to view demographic trends, income levels, voting patterns, pollution levels, traffic on highways, and crime patterns. In developed countries governments are integrating GIS with e-government services. Governments provide services to locations within the jurisdiction of their political and administrative boundaries. As such governments are stewards of large databases ranging from information about the demographics, characteristics and activities of its people, communities, institutions, infrastructure, natural resources, and public services. GIS is used in an extensive range of public sector applications including, land use and urban growth planning, legislative districting, conservation, benchmarking human services, emergency management, environmental monitoring, humanitarian relief, natural disasters and public information services.

In brief, GIS along with ICT is being used increasingly to support the e-government strategies in developed and developing countries and is making an impact on the complex issues affecting human development in respective countries. GIS, a compound technology for governments to use it, relies closely on computerized map data that needs to show the key features of the area within the jurisdiction of the government. Therefore, developing countries like Pakistan needs to establish governance of the GIS data to control accessibility, accuracy, and responsibility of updating, distribution, and data sharing.

Published on: 27th January, 2014

Media And Good Governance: An Essential Relationship

The origin of the theory of "Good Governance" can be traced back to the Ancient Greek period if we catch the essence of Aristotle's fundamental statement "the state came into existence for the sake of mere life, but continued for the sake of good life". If we look into the term "Good Life" we can traced out the components of good governance which we converse in modern time. The political philosophers like Hobbs, Lock and Rousseau also stated the stipulation of the good governance through their social contract theories of the origin of the state. As said by John Lock, governments shall govern as long as they protect the interest of the people or the trust of the people has placed in them. This is how the concept of democracy rule by consent and good governance came into existence in the theory and practice of the governments.

MEDIA ALSO HAS A CRITICAL ROLE TO MEDIATE BETWEEN THE STATE AND CITIZENS THROUGH THE DEBATES AND DISCUSSIONS ABOUT THE MAJOR ISSUES OF THE DAY AND INFORMING PEOPLE ABOUT THE STAND OF THEIR LEADERS ON SUCH ISSUES.

The World Bank defines: *"Good Governance is epitomized by predictable and enlightened policy making; a bureaucracy imbued with a professional ethos; an executive arm of government accountable for its actions; a strong civil society participating in public affairs; and all behaving under the rule of law"*.

Media plays an influential role in shaping a strong and healthy democracy and ensuring good governs. As a vital source of information media has been functioning the role of the heart of

democratic society and good governance. The dynamic and vigilant participation of media is crucial in a democratic society. It is an important presumption that the media speaks for the people, represents the interests of the society, and serves as a check on the government. This process holds government accountable and transparent and throughout this function the media helps to ensure good governance. In contributory the democratization and good governance the media has three key functions. The very fundamental function of media is to act as a watchdog over the powerful, promoting accountability, transparency and public scrutiny. The second important responsibility of media is to function as a civic forum for the political debate, facilitating informed electoral choices and actions; and the third job is to act as an agenda-setter for policy makers, strengthening government responsiveness for instance to social problems and to exclusion.

Democracy oblige that people should have the right to know all the activities of the government, particularly the decision of the government that affects their life, liberty and property. Hence, media also has a critical role to mediate between the state and citizens through the debates and discussions about the major issues of the day and informing people about the stand of their leaders on such issues. In 'watchdog' role, the media can play a significant role to promote transparency, accountability, and public scrutiny of decision-makers, by highlighting policy failures, maladministration by public officials, corruption in the judiciary, and scandals in the corporate sector. Investigative journalism can open the government's secret records to external scrutiny and critical evaluation, and hold authorities answerable for their actions. The watchdog function of media is essential in a democratic society where people must know what their governments are doing. The primary democratic function of the media is to act as a check on the state. The media should observe the

activities of the state, and fearlessly expose exploitations of official authority as good governance requires the principles of transparency, accountability and participation. Democracy is the government which rest on the active consent of the governed, as an important source of public information media could be expected to be a vehicle to encourage the promotion of these principles of good governance.

Information is very necessary for people to formulate decisions about their participation in the state and the civil society. Sufficient information helps the citizens to decide wisely and take the right course of action favorable to them. Media thus helps people to know what is happening around the society. In Pakistan, media is not only been playing a key role in protection of rights by making people aware of their rights but also making people to observant on political developments in the society and helping to stimulate debate drawing attention to all social evils including the institutional failures, corruption, inefficiency and illegal activities. The media and the public are not only players as the society moves towards good governance reform, but also it takes a good quality rejoinder from the government as well. In accordance with the principle of transparency and good governance, the government should provide to the media open access of information on public policy matters. Principally the media should be equipped with the indispensable investigative power to bring out the truth to the public and fulfill their function in promoting good governance. Access to information, freedom of the press, and an umbrella legal instrument can together support the processes of democracy and good governance in Pakistan.

Published on: 11th August, 2014

e-Governance: An Important Tool For Fighting Corruption

Throughout the world, governments are faced with the challenge of renovation and the need to reinvent government systems in order to deliver efficient and cost effective services via information and communication technologies. E-government is understood as the use of such technologies to promote more professional and successful government, more convenient government services, greater public access to information, and more government accountability to citizens, whereas governance is a wider term which covers the state's institutional arrangements, decision making processes, implementation capacity and the relationship between government officials and the public. E-government can not only be viewed as a subset of e-governance, and its focus is largely on improving administrative efficiency and reducing corruption but also can result in huge cost saving to governments and citizens.

EVEN THOUGH THERE IS NO SINGLE SOLUTION IN FIGHTING CORRUPTION BUT EVERY COUNTRY HAS TO EXAMINE ITS SOLE CIRCUMSTANCES AND COME UP WITH A WIDESPREAD STRATEGY, WHICH SHOULD EMBRACE THE THREE PRONGED APPROACH – DETERRENCE, PREVENTION AND EDUCATION.

The topic of anti-corruption has recently generated generous academic interest. Each corrupt transaction requires a "buyer" and a "seller". Eventually, all parts of society must share the responsibility for containing corruption because all are willing or unwilling participants. Corruption does have some common characteristics. For example, it occurs in all countries despite of the level of social and economic development. Regardless of this common characteristic,

corruption takes on very different features from one place to another. Corruption flourishes in different places in different forms including: land rezoning, custom duties, income tax collection, non-merit based appointments, promotions, and many more.

The World Bank "Youth for Good Governance Program" divides the corruption in two categories:

- Administrative Corruption: Corruption that alters the implementation of policies, such as getting a license even if you do not qualify it.
- Political Corruption: Corruption that influences the formulation of laws, regulations, and policies.

In the broader way, the main types of corruption can be term as:

- Bribery: An offer of money or favors to influence a public official.
- Nepotism: Favoritism shown by public officials to relatives or close friends.
- Fraud: Cheating the government through deceit.
- Embezzlement: Stealing money or other government property.

There are four basic domes in which action can be taken against corruption within a country: Firstly, the basic institution of good governance needs to be strengthened. Judiciary is at the head of the list, which is itself the protector of laws and integrity. Secondly, the capability and integrity of law enforcement need to be improved. The best law has no value if it is not enforced. Thirdly, a government needs to put in place a solid set of protective tools. Codes of Conduct and strong independent oversight bodies can help ensure that the acceptable standards of behavior are respected in both the private and public sector. Political leaders in all branches of government,

legislative and judiciary can be required to have transparency in their own financial dealings through asset disclosure for themselves and their family members. Lastly, the public needs to be educated on the advantages of good governance and participate in promoting it. The public itself bears a large share of accountability for insisting on honesty and integrity in government. The public needs to learn: (a) not to let anybody buy their vote; (b) not to pay bribes; (c) to report corruption to the authorities; and (d) to teach their children the right values; e.g. that corruption is bad.

Even though there is no single solution in fighting corruption but every country has to examine its sole circumstances and come up with a widespread strategy, which should embrace the three pronged approach – deterrence, prevention and education. The employment of ICTs can bring more transparency into public administration and polities. E-governance has the potential to involve citizens in the governance process by engaging them in interaction with policymakers throughout the policy cycle and at all level of government.

Published on: 27th March, 2014

E-Democracy: Isn't It A Key To Cease Corruption?

"The real difference between democracy and oligarchy is poverty and wealth. Whenever men rule by reason of their wealth, whether they be few of many, that is an oligarchy, and where the poor rule, that is democracy" **– Aristotle**

It is now extensively accepted that Information and Communication Technologies (ICTs) have an important role in national development. The developmental prospective of information and communication technologies have been broadly discussed in the scientific literature but we still lack conceptual precision on the role of ICTs for success and failure of national development process. In recent times ICT is exploit by citizens and civil society for networking and improve advocacy and mobilization, local and globally. Blogs, Facebook and online communities create new modes of social contact. The use of ICT has influenced social movements and has also had an effect on the social life and democratic freedoms in some societies. The existing explanation of freedom and democracy, by the UN Universal Declaration of Human Rights, states that every individual have rights to free communication, religious and political participation, and to engage in economic activity. These rights are defined as political, economic, and religious freedoms. Many scholars connect political freedoms with constitutional democracy (the right of individuals to elect their governments).

PAKISTAN HAS A DEMOCRATIC SYSTEM WITHOUT DEMOCRATS AND IT IS HIJACKED BY A SMALL GROUP OF FEUDAL LORDS, POLITICAL ELITES, BUREAUCRATS AND ORGANIZATIONS UNDER FOREIGN INFLUENCE.

ICT offer new tools for well-organized public contribution in the democratic process in the form of e-democracy, e-government, e-voting and the propagation of opinions, thoughts, ideas, and rallying social action about things that concern society. At present ICT can be used to improve the democratic process in the form of e-government in which citizens are able to effectively impact the decision-making process in a judicious approach within and between institutions. In government, ICT not only can increase accountability and transparency, and counter corruption through more proficient administration and increased flows of information but also strengthen good governance and improve interaction between government and citizens. E-democracy can be closely defined as "e-administration", where ICT serves to modernize inter-governmental relations and flows of information with the view to improve government services, transactions, and interactions with citizens, businesses, and other arms of governments. E-democracy can facilitate better service to citizens by:

- Offering information via government web pages;
- Facilitating access to government services, and;
- Developing depersonalized services which reduce risk for corruption.

Generally, one can differentiate between three levels of ICT use to advance democratic processes at the national level:

1. ICTs within government, with a view to improve efficiency in interactions and information flows between government departments and state organs.
2. ICTs in the interface between government and citizens, with a view to improving interaction and feedback between government and citizens.

3. ICTs for empowerment of citizens and civil society organizations.

Presently, Pakistan has a democratic system without democrats and it is hijacked by a small group of feudal lords, political elites, bureaucrats and organizations under foreign influence. Most of the time, democratic election only commit to reshuffling of the same old faces. Regardless of miserable performance of political parties, low level of people's participation in party politics and lack of political culture, majority of the people still believe that political parties are the backbone of democracy. Pakistan where democracy has not deep root saturation, ICTs have provided the users an opportunity to be aware of their socio-political and human rights and they show strong inclination towards attending social and political meetings as a matter of right.

ICTs are foundations of socio-political information and development and can be a precious tool for enhancing people's contribution in the development of policies, laws, strategies and other documents that shape their future. Since Pakistan is a developing country that faces many development challenges, plus extreme poverty, a low literacy rate, poor health facilities, and a weak socio-political situation, characterized by corruption and a lack of informed decision-making, ICT for progress is still at a nascent stage from a civil society standpoint. Even though the government is devoted to the development of ICT infrastructure in Pakistan but, the country is a graveyard of many failed and unsuccessful projects. Unfortunately, the government takes massive loans from the IMF, World Bank and others but there are practically no checks to measure the success of the projects they send the money on, or ways of helping to eradicate corruption in the implementation of projects. There are barely any monitoring and estimation procedure in country that is why

according to The Transparency International annual report 2012 the corruption of Rs 12600 billion reported in different sectors of Pakistan during the last five democratic years.

The United Nations general assembly selected '9 December' as International Anti-Corruption Day, to elevate awareness of corruption. On this International Anti-Corruption Day, let us promise to do our part by cracking down on corruption, shaming those who perform it and prompt a culture that values ethical behavior as democracy is based on two core principles: participation and accountability!

Published on: 12th December, 2012

Revisiting The Role Of ICT To Combat Corruption!

"Bringing together communities that traditionally did not collaborate to fight corruption – activists, IT experts and musicians – hit the nerve of a young generation that wants to engage to define their countries future" **– Boris Weber**

The internet, cell phones and associated technologies are deeply affecting social, economic and political institutions worldwide, primarily in new and emerging democracies. Governments all over the world have started resorting to the newly originate information and communication technology (ICT) to establish a citizen-centric, more transparent and more accountable government mechanism. Existing ICT infrastructures together with governments' willingness to implement e-government have already brought success in e-government initiatives across the industrialized world. As a least developed but emerging economy, Pakistan has been struggling to improve its government structure. Spoiled by corruption, political division, inefficient bureaucratic practices, it has been a difficult task for the government to put the country on the right development path. However, the country has been endeavoring to implement e-government in recent years to advance its current administrative practices and to establish better relationship and transparency between government and its various stakeholders.

CIVIL SOCIETIES IN DEVELOPING COUNTRIES ARE DEMANDING GREATER TRANSPARENCY AS A KEY COMPONENT IN FIGHTING CORRUPTION AND EMPOWERING PEOPLE LIVING IN POVERTY.

The most cited source for corruption discussions, Transparency International (TI), defines corruption as the abuse of entrusted power by political leaders or bureaucracy for personal gain or specific group interest. Most other international organizations, such as the UN and the World Bank, use either that definition or very similar ones. ICT has been acknowledged as a feasible tool for diminishing corruption by enhancing transparency and accountability of government administration. For example, the World Bank defines electronic government (e-Government) as "the use of information and communication technologies (ICT) to improve the efficiency, effectiveness, transparency and accountability of government" and argues the "e-Government helps to increase the transparency of decision-making processes by making information accessible – publishing government debates and minutes, budgets and expenditure statements, outcomes and rationales for key decisions, and in some cases, allowing the on-line tracking of applications on the web by the public and press" (World Bank, 2010).

According to the United Nations Development Programme and United Nations Office on Drugs and Crime, "*No matter how corruption is defined, it weakens societies and impacts and hinders social and economic development. It deflects domestic and foreign investment away from where it is needed; it weakens education and health systems; exacerbates inequality; distorts electoral processes and undermines government institutions*". Corruption exists in all sectors of society and it damages country's development by undermining faith in public institutions. Corruption falls unreasonably on the poorer members of society and hinders them from accessing scarce services. Civil societies in developing countries are demanding greater transparency as a key component in fighting corruption and empowering people living in poverty. Increased transparency is often dependent on political will, and civil society around the world is actively challenging their governments to

open up systems to public scrutiny. When governments do not have the capacity or the will to launch administrative reforms to remove the opportunities for corruption, adding external pressure on officials by increasing the risk of exposure might be a workable alternative.

While ICT is not a magic bullet when it comes to ensuring greater transparency and less corruption, it is convinced that it has a significant role to play as a tool in a number of important areas:

- ICT can perk up transparency in public sector by growing the coordination, dissemination and administrative capacity of the public sector, as well as improve service delivery by employing user-friendly executive systems.
- ICT assists the collection of digital footprints and complete audit trail which increase the opportunity to hold individuals accountable and eventually increase the possibility to spot corrupt practices.
- ICT can facilitate the work of civil society organization working towards greater transparency and against corruption by supporting a mix of methods of campaigning on transparency and educating citizens on what corruption is about and their civil rights.
- ICT can help information sharing and social mobilization and ultimately provide digital platforms where citizens can report incidents anonymously.

In nutshell, citizens must have access to public information in order to allow democracy to function. Lack of access to information results in non-participatory society in which political decision-making is not democratic. Access to information concerning governance of the state allows individuals to exercise their political and civil rights in electronic processes; challenge or influence public policies; monitor

the quality of public spending; and demand accountability. Access to information and transparency are thus prerequisites for democracy as well as a key tool in the fight against corruption.

Published on: 9th September, 2014

Citizen-Centric e-Governance: Can Pakistan's Democracy Be Improved?

Information and Communication Technologies (ICTs) have turn into the miracle medicine for curing any country from the diseases of corruption, mismanagement, poor governance, inflation, monopolies, illiteracy and so forth. ICT tools and techniques to support good governance have considerably changed with the appearance of social media, simulation techniques, opinion mining, open government data, text analytics and visualization. Today, people are more connected than ever before through ICT, linked to family, friends, social groups, and increasingly, government. Similarly, ICT tools are empowering to engage with government and find clarity on issues that touch their lives. In developed countries, governments are regarding the call to deliver information in a way that create transparency and demonstrates accountability. In every sector, information and communications technologies (ICTs) are powerful tools for controlling corruption and ill practices. ICT works principally well when they are embedded in extensive institutional reforms. Generally, ICTs for good governance and controlling corruption operate by shining a bright light upon institutional development. ICTs improve transparency particularly at the transactional level, at the same time offer opportunities for easier access to public records, and establishing linkages among geographically separated structures for better accountability.

PUBLIC PARTICIPATION ALWAYS HAS POSITIVE REPERCUSSION ON GOOD GOVERNANCE AND ADDING THE 'E' CAN MAKE GOOD GOVERNANCE BETTER AND BAD GOVERNANCE WORSE.

In every part of the world from industrialized to developing countries, governments are putting information online to provide better services for citizens and good governance. Globally, there are various countries that are aiming towards refreshing their public administration by making it more proactive, accountable, service-oriented and transparent. This transformation requires intervention of technology in administration and governance, accordingly ICT can play significantly important role in advancement of public sector and its governance. Governments around the world are, therefore, making use of ICT as a standard for promoting Simple, Moral, Accountable, Responsive, and Transparent (SMART) electronic government (e-government). Generally, e-government incorporates four dimensions:

- Democratic dimension (e-Democracy): Focusing on the political processes and interaction between the constituents and the government.
- Administrative dimension (e-Administration): Including various types of management work, internal and external routines.
- Service dimension (e-Service): Relating to the delivery of all types of services.
- Participation dimension (e-Participation): To engage with citizens and enable deeper contributions and support deliberative debate on policy issues and to support the democratic decision-making process.

UN member states have recognized broad public participation as an essential prerequisite for the attainment of sustainable development. Public participation always has positive repercussion on good governance and adding the 'e' can make good governance better and bad governance worse. Establishing good governance and public participation have become a key concern for sustainable socio-

economic development. It has been acknowledged that development cannot take place without sound and capable governance.

Today, technologies in computing, information system and communication have led to the death of distance and time. Networking technologies work exceptionally fast and can improve anything and everything. Using ICTs to promote, as stated in United Nation's Millennium Declaration, "*democratic and participatory governance based on the will of the people,*" may lead to more responsive and effective government. In a nutshell, democracy, good governance and modernity cannot be imported or imposed from outside a county. Let every forum of policy makers, political leaders and ICT professionals' converse and fabricate a comprehensive set of recommendations for the successful execution of anywhere-anytime citizen-centric e-Governance across Pakistan.

Published on: 14th January, 2016

Security and Policy

G2C e-Governance & e-Frauds – A Perspective For Digital Pakistan Policy

e-Governance, sometimes referred as e-government, online-government or digital government, is the use of information and communication technologies (ICTs) to assist in the transformation of government structures and operations for cooperative and integrated service delivery for citizens and government agencies. e-Governance involves using ICT tools to improve the delivery of government services to citizens, businesses, and other government agencies. e-Governance encompasses a wide range of activities and actors, these include government-to-government (G2G), government-to-business (G2B), and government-to-citizen (G2C).

The benefits to be expected from e-Governance initiatives can be put into three major categories:

- Improve transparency, accountability, and democracy, which reduced levels of corruption,
- Citizen and business satisfaction and confidence with public services, and
- Improve achievement of economic and social policy outcomes (e.g. education, health, justice, welfare, industry development etc.)

e-Governance not only plays a critical role in building inclusive, resilient societies but also, enables citizens to interact and receive services from the federal government and local governments 24 hours a day, seven days a week – 24/7. In many respects, the government-to-citizen (G2C) segment represents the backbone of e-Governance. The G2C initiatives are designed to facilitate citizen interaction with

government, which is recognize to be principal objective for good governance.

Despite the opportunities e-Governance offers, it also introduces new challenges. In recent times, Government of Pakistan (GoP) has demonstrated a real willingness to transform relationships between government services and citizens, particularly by strengthening the use of ICT and by offering services online, - (Digital Pakistan Vision). Civil society is also committed to implementing such initiatives to improve democratic governance using ICT.

On the other hand, despite the possible opportunities for implementation of e-Governance, Digital Pakistan initiatives, there are a number of challenges that could prevent the recognition of anticipated benefits. Some of the challenges, for instance disparities in computer and internet access, whether due to lack of financial resources or necessary skills, pre-existing systems and conditions, digital literacy (e-literacy) and more importantly electronic frauds (e-frauds).

The term 'fraud' commonly includes activities such as theft, corruption, embezzlement, money laundering, bribery and extortion. From the perspective of e-fraud, it may be described as "Inducing a course of action by deceit or dishonest conduct, involving acts of omissions or the making of false statements, with the object of obtaining money or other benefit." e-Fraud is also defined as a deception deliberately practiced to secure unfair or unlawful gain where some part of the communication between the victim and the fraudster is via a network and/or some action of the victim and/or the fraudster is performed on a computer network. As a matter of fact, e-fraud is not only technical and management problem but also a social problem.

In Pakistan, a citizen-centric approach (G2C e-governance) will enable the government to provide improved service qualities, which in turn develop the citizen satisfaction in democracy. However, due to a variety of technical, economic, and political reasons, e-Governance initiatives will take time to evolve into their full potential. Similarly, the exact scale of e-fraud (online or offline) being committed in Pakistan is currently unknown. Nevertheless, there are certain areas of concern regarding the "Digital Pakistan Policy – 2018", for which the following recommendations are put forwarded for consideration in future reviews.

- Digital Pakistan Policy must be practicable, outcome-focused, risk-based, citizen-centric, locally and globally relevant.
- Policy makers must first educate themselves better with the respect to Internet of Things (IoTs), internet and cyber security along with electronic frauds (e-frauds), and formulate an effective anti e-fraud strategy within Digital Pakistan Policy.
- Government must support the necessary research and development (R&D) to address digital issues (e.g. e-frauds and cyber-space ethics, network and cloud security etc.), and establish a program to educate citizenry about the digital ecosystem (e-literacy).
- Government must overcome the obstacles to realistic, timely, actionable information sharing with all government institutions/departments and stakeholders.
- Government must get its own house in order, continue its efforts to strengthen good governance with emphasis on merit-based institutional development and rule of law. And, exceptionally eliminate corruption and nepotism from the society.

ICT For Re-Engineering The National Security Strategy

"The 'War on Terror' is one of the most critical national security efforts in our history" **– Sue Kelly.**

In the past few years, it became evident that there exits close connection between ICT and national security, which plays a significant role in securing the necessary level of national safety and defense of the nation. The notion 'Security' is defined as status of defense of the life-important interests of the personality, the society and the state against internal and external dangers. Whereas, according to Oxford Dictionary, "*security is the degree of protection to safeguard a nation, union of nations; person or persons against danger, damage, loss and crime*". Information and communication technology is defined as technology that facilitates communication and the processing and transition of information by electronic means. ICT is an umbrella that involves any communication application or device, such as; television, radio, satellite system, cellular phones, computer hardware and software.

ENHANCING NATIONAL SECURITY WITH NEW INFORMATION AND COMMUNICATION TECHNOLOGY ALSO INVOLVE ADDRESSING FUNDAMENTAL PROBLEMS IN EDUCATION AND LONG-TERM RESEARCH AND DEVELOPMENT.

The theory of security was put forward by UN bodies and has placed human security firmly on the global political and development agenda. Security can be thought of as a 'public good', responding to the strategic need to support sustainable human development at the

same time as promoting national, regional and global peace and stability. While, national security is the ability to safeguard the nation's physical integrity and territory; to maintain its economic relations with the rest of the world on reasonable term; to defend its institution, and governance from disruption from outside; and to control its borders. According to Dr. Hasan Askari Rizvi (Political and Defense Analyst) *"The issues of national security have multiplied because it is not always possible to draw a clear line between internal and external domains of the state, especially in the case of the state facing serious internal regional, ethnic conflict or separatist movement. Such events have a tendency to attract varying degree of international attention and intervention if these persist and intensify over time"*. National security is also a capability to control those domestic and foreign conditions that the public opinion of a given community believes necessary to enjoy its own self-determination or autonomy, prosperity and well-being.

ICT has progressively become one of the central marks affecting every feature of development not only in Pakistan but the world over. Momentous ICT progresses are constantly taking place and continue to impact on socio-economic operations at various levels of society. The pervasiveness of ICT has brought about rapid technological, social, political and economic revolution. ICT strengthens and provide opportunities for connection among the countries of the world and it also provides quicker and easier access to more extensive current information that can be used to carry out security operations.

The model of national security is multidimensional. Enhancing national security with new information and communication technology also involve addressing fundamental problems in education and long-term research and development. The under listed are some recommendations which may help in the use of ICT for national security:

- Government should pay more attention to the ICT related higher education and funding of ICT so that it can be of greater help as tool in monitoring security system.
- Our leaders should exhibit good moral character in their governance and eradicate corruption in the society.
- Government should promote human security culture, framework and raise awareness on human security issues in our society.
- Government should control arms trade within the country.
- Fundamental human rights must be respected, protect minorities and fight against ethnic discrimination.
- Transition governments should be supported so as to prepare free and fair elections, promote a culture of open, tolerant and pluralistic society that accepts cultural diversity.

The rising significance of information and communication technology presents not only new opportunities to promote modern society, but also brings challenges to the approach and tactic of securing that society from outside attack. National security is all about people, and the people must accordingly contribute their share as we all struggle to restore peace and security to our nation. Legislators and policymakers must modify their focus and dedicate resources and efforts to ensure that security measures are in step with evolving technology. National security policymakers should therefore, accelerate the rate of development and embrace information and communication technology as a re-engineering strategy to bring about security revolution in Pakistan.

Published on: 28th January, 2015

Fighting The Smokeless War – Who Will Frame National Cyber Security Policy?

The 21st century is seeing more countries paying attention to asymmetrical threats as a new dimension in strategic defense. Although, traditional security issues will continue into the new century but threats such as terrorism and trans-boundary crime has also attracted attention and is given focus as parts of the national strategic perspective. It is alarming that, in recent years, together with the occurrence of new information and communication technology (ICT) and the development of the internet, new threats have appeared, such as cyber-crime, cyber-terrorism, cyber espionage and cyber-conflicts, with the participation of non-state entities, and cyber war understood as confrontation between countries in the cyberspace.

Current trends in the development of threats in the cyberspace clearly indicate an increasing influence of the level of security of the cyber domain on the general security of the country. The recent development in our region has pointed to a number of new challenges and uncertainties which impact Pakistan's national defense. Various forms of extremism motivated by political, religious, ethnic or other reasons pose an important challenge for the national security. They are

A MODERN NATION-STATE INCREASINGLY DEPENDS ON CYBERSPACE FOR ITS ECONOMY, PUBLIC SAFETY AND DEFENSE.

PAKISTAN STILL DOES NOT HAVE A SOLID CAPACITY ALLOWING THE EFFICIENT ADMINISTRATION, CONTROL AND MANAGEMENT OF ITS CYBER SECURITY.

particularly dangerous when they are connected with the use of terrorism.

The rapid evolution of information and communication technology (ICT) is escalating the pace, capability, flexibility, efficiency and effectiveness of the current networks and systems, both within the civil and military scope. Information in conjunction with communication technologies are altering the way in which people interact between themselves and with their environment. This continual and accelerated progression of the ICT has led to cyber-attacks becoming more and more sophisticated and numerous, leading to a cyber space that is ever more hostile, forcing those responsible for national and cyber security.

Security, in all its dimensions and spheres, is the first responsibility of any government. The government of Pakistan should assume leadership regarding cyber security in order to make its citizens aware of the need for protecting our cyberspace. Pakistan still does not have a solid capacity allowing the efficient administration, control and management of its cyber security. Therefore, the government and policy makers are accountable for setting the agenda for securing all national security domains including cyberspace. Ideally, the government may perform the following roles:

- Characterize of the role of cyberspace in achieving national development goals;
- Identify, analysis and mitigation of risks to achieving national interests;
- Develop cybercrime/cyber-terrorism legislation that is applicable and interoperable;
- Resource national cyber-security programs and institutional capacity building;

- Formulate and defend cyber-security position at regional and global forums.

In many countries, cyber-security has become a national policy priority supported by loyal and devoted leadership. They are approaching cyber-security in a holistic manner, including, economic, social, educational, technical, law-enforcement, diplomatic, military and intelligence-related aspects. A modern nation-state increasingly depends on cyberspace for its economy, public safety and defense. As a result, establishing a national policy for cyber-security is now and will continue to be an essential and critical element of the overall national security for the government. Another key aspect to bear in mind for the National Cyber Security Policy is the identification of cyber space as the new dimension of the operating environment. It will therefore be compulsory to provide our Armed Forces with cyber capabilities and human, technical and economic resources necessary for their exercise and functions.

There are certain areas of concern regarding the "National Cyber Security Act 2014" introduced in the Senate of Pakistan, for which the following recommendations are put forwarded for consideration in future reviews.

- Policy makers must first educate themselves better with respect to the internet, internet and cyber security together with its role in modern society;
- Government must get its own house in order and eliminate corruption and nepotism;
- Government must support the necessary R&D to address issues;
- Government must overcome the obstacles to realistic, timely, actionable information sharing with industry;

- Policy makers must establish a program to educate citizenry about the nature of the problem and alleviation approaches;
- Cyber-security policy must be risk-based, outcome-focused, practicable and globally relevant.

To finish, the development of cyber-security policy is a long-lasting dedication for the security and stability of country and its cyberspace, and government must have a voice in international arena in this critical dot.

Published on: 9th February, 2016

GIS For National Security And Counterterrorism Strategy

At least for the last three decades, one of the most discussed topics in social sciences is terrorism and national security. However, social sciences lack a logical justification of why terrorism occurs? Why it escalates and de-escalates? Why certain types of victims are selected? And, what determines the choice of weapons? Despite some contributions by scholars from security and regional geopolitics, political science, law and international relations, the state of hypothesis, data and facts about causes of terrorism remains in hysteria.

Justifiably, terrorism remains one of the security challenges of the modern world – together with organized crime, extremism, religious, ethnic and social conflicts. Identifying that terrorism is an artifact of an amalgamation of demographic, economic, and political determinants, a panel of National Research Council observes that "*regions most likely to generate terrorist threats have a history of colonialist exploitation by Western interests, and of postcolonial economic and cultural penetration. Particularly in nondemocratic societies, conflicts generally reflect class, ethnic, racial, or religious divisions*".

Since 9/11 attacks and its causes and consequences, the terror events have sparked transformed concern in the deployment of technologies in the fight against terror and national security. Despite the characterization and dimension of terrorism changing over the decades, GIS has been found to be a very effective contrivance. It has the potential of preventing, predicting or countering terrorist attacks, while helping to strategize and support ground level combat operations. GIS application in the fight against terror begins with monitoring and surveillance of terror activity. It moves on to

disseminate critical information through the various public service agencies, law enforcement agencies, intelligence departments and homeland security system. In the event of a terror attack, geospatial tools and technologies not only help to secure citizens and property but also, support the ground combat operations.

An act of terrorism does not happen in the vacuum usually has a planning cycle thus, displays distinct temporal trends. At the same time, the planning exposes a bimodal spatial pattern of preparation and target selection. The bimodal geospatial platform is capable to project the terrorist's pre-attack behavior in a space-time trajectory and the information may available in real time for a decision support system. GIS technology enables a seamless flow of information between intelligence and law enforcements agencies for monitoring and combat operations not only at the local but also, neighborhood level. GIS and related geospatial technologies can be applied to national security and counterterrorism in five principle manners. Firstly, GIS can serve as a tool for intelligence analysis. Secondly, GIS can be employed to simulate scenarios for terrorist attacks to identify and harden targets. Thirdly, GIS can be used to coordinate the immediate response to an actual attack by providing information on the proximity of attacked sites to first responders – police, fire, medical and other resources. Fourthly, GIS as well as GPS, aerial videography, laser detection and ranging (LiDAR) can be used to assess the short-term and intermediate-term effect of an attack and aid in establishing the boundaries of evacuation zones, locating evidence, locating and rescuing victims, building collapse, and so on. Lastly, GIS and satellite remote sensing or digital aerial imagery can be used to coordinate retaliation in the form of air strikes and to assist a whole range of more subtle military, paramilitary and law enforcement responses.

Areas of GIS Application in National Security and Counterterrorism:

- Terror Group Surveillance
- Intelligence Gathering and Visualization
- Contingency Planning
- Military/Police Operations
- Timely Decision Support
- Real-time management of field operations
- Monitoring of Potential Targets
- Area Assessment – terrain, layout, location, roadmap
- Countering Terrorist Financing
- Geospatial Intelligence

In the Pakistan context, volatile neighborhood necessitate that the Pakistan Armed Forces have to be prepared for operations across the spectrum of conflict – sub-conventional, conventional and nuclear. Such a threat scenario can only be effectively addressed by the efficient use of modern technologies and systems using GIS tools. The fight against terrorism cannot be efficient without cooperation and coordination of activities and actors. Apart from an adequate legislative framework, which is indispensable for the security system to run smoothly, it is also important to keep the right channels for a swift and reliable exchange of relevant information. It is thus necessary to constantly review the communication and cooperation equipment and processes and make sure they are fit for purpose both in terms of current and long-term needs.

Published on: 16th October, 2017

GIS For Strategic Security Of CPEC

The 21st century has seen the establishment of global and regional strategic milieu around the world. This strategic milieu persuades geo-economic and geo-political tactical partnership among regional countries. Regional connectivity is one of the most significant aspects of Pakistan's foreign policy and Pakistan has been trying to develop good relations with its adjacent countries. Maintaining creditable and healthy relation with China has been an essential part of Pakistan's foreign policy, as China is Pakistan's strategic partner and helps Pakistan in maintaining balance of power in the region.

The history of Pak-China relations can be traced back since 1950 and both countries managed their connection in a very productive and articulated way. With the support of China, Pakistan has gained significant importance not only in the region but the entire world. In recent years, both China and Pakistan developed a strong bond of trust and Chinese foreign policy gives a special focus to Pakistan in future endeavors of China. China-Pakistan Economic Corridor (CPEC) is one of the most prominent examples of that. The CPEC is a megaproject that will connect Gwadar and Xinjiang via a network of highways, railways, and pipelines to transport goods, oil and gas. This economic corridor will run about 30,000 KM from Gwadar to Kashgar. The investment package is estimated at

DEPLOYMENT OF GIS TECHNOLOGY THROUGHOUT CPEC WILL NOT ONLY ENABLE STRATEGIC SECURITY BUT ALSO PERFECTION IN DISASTER MANAGEMENT, HEALTHCARE PLANNING, FOOD SECURITY, WATER RESOURCE MANAGEMENT, URBAN DEVELOPMENT, PUBLIC SAFETY, EDUCATION, AND THE ECONOMY FOR CITIZENS OF THE PAKISTAN.

over $ 46 billion, comprising special economic zones, dry ports, energy projects, highways, railways, telecommunications, natural gas and oil pipelines connecting China to the Middle East and improving intelligence sharing between the two countries.

CPEC is an under-construction megaproject which will not only achieve the political and economic objectives through trade and development but also strengthen the economic and trade cooperation between the two countries. Pakistan's leadership illustrates the CPEC as a game changer for Pakistan and the region. On the contrary, the dividends of this project will wholly turn up gradually over a period of 10 to 15 years thus requires an unremitting determination on the part of China and Pakistan to stay firm on the course. A strict scrutiny of the performance and quality of work on different projects is need of time. Similarly, safeguards are needed against corruption, pilferage of material and project payouts. Additionally, security concerns have been the most critical challenge to the CPEC and both Pakistan and China have been trying to meet these. Pakistan faces several challenges in the implementation of the project and these challenges include external and internal. Today's biggest concern is the safety and security of engineers, technicians and labors working on the corridor project. Providing security to Chinese personnel is today's major challenge for Pakistan.

On April 2015, the Pakistan Army announced the establishment of a 'Special Security Division', headed by a Major General, for providing safety and security to those working on the project. Decision makers should realize that effective action in complex and dynamic areas require both new analytical tools and new approach of collaborating between stakeholders and these tools must be adequately sophisticated to deal with convolution of the policy arena. Geographic Information System (GIS) meet this sophistication and intelligible

requirements. The power of a GIS is its capability to graphically organize and display a series of location-based information. GIS enables strategic security and safety by helping government agencies protect borders and critical infrastructure. GIS provides a common operating picture that is used for routine operations in mitigation, preparedness, response and revitalization from all kind of emergency events. GIS is a core component of situational awareness and can integrate various sensors, field activity, road closures, threats, assets, critical infrastructure, and weather to better inform emergency and security concerns. The under listed are some recommendations which may help in the use of GIS for CPEC strategic security.

- There is an urgent need for massive acquisition and installation of GIS equipment in the country.
- There should be immediate training of security personnel who will handle GIS technology to curb terrorism in the country. Pak-China counter terrorism mechanism is also required.
- Terrorist hot spots in Pakistan should be map out by the security agencies in collaboration with criminologists and technology experts for the purpose of constant monitoring using the GIS.
- Government should direct its finances to the area of great need such as the GIS. And leaders should exhibit good moral character in their governance and eradicate corruption and nepotism in the society.
- Corruption and nepotism in the public system especially within the security outfits must be drastically tackle. Security agencies must purge themselves of all acts of corruption and nepotism if the GIS must be successful in tackling terrorism and security concern.

The CPEC project will audaciously alter Pakistan's geographic location into an asset. The ongoing construction of the CPEC is undeniably one of the largest endeavors for socio-economic progress in the country and deployment of GIS technology throughout CPEC will not only enable strategic security but also perfection in disaster management, healthcare planning, food security, water resource management, urban development, public safety, education, and the economy for citizens of the Pakistan.

Published on: 14th February, 2017

Addressing A New Paradigm: Infectious Diseases And National Security

"If it creates instability, chaos, conflict and war, that has national security implications." **– Samuel R. Berger**

Conventionally, national security has been defined as the safeguarding the state from physical threats. The last two or three decades have seen sharp rise in other non-traditional threats, such as drugs, and diseases. Emerging and re-emerging infectious diseases, and their pandemic potential, pose a challenge to national security in the 21st century that cannot be overlooked. The historical threat to national security by epidemic diseases is not new; however the threat has increased in recent past and is growing rapidly in developing countries like Pakistan. There are many lines of attack that infectious diseases can intimidate national security i.e. increased rates of morbidity and mortality, massive damage on public health and health infrastructure, political instability, and economic volatility.

A NEW PARADIGM IS NEEDED THAT LINK INFECTIOUS DISEASES TO NATIONAL SECURITY AND RECOGNIZE THE BROAD EFFECTS OF DISEASES ON OUR SOCIETY. RESPONSE TO INFECTIOUS DISEASE THREATS SHOULD BE STRATEGIC PRIORITY OF HEALTH AND SECURITY AGENCIES.

The world has changed noticeably ever since World Health Organization (WHO) issued its first set of legally binding regulations aimed at preventing the international spread of disease. At that point in time, the disease situation was quite stable, new diseases were rare and drugs had transfigured the care of many recognized infectious

diseases. However, today's vastly itinerant, interdependent and interconnected world provides innumerable opportunities for the quick stretch of infectious diseases and toxic threats. Infectious diseases are now spreading geographically much faster than at any time in history and currently are the second leading cause of death worldwide and the leading cause of morbidity. Roughly, there are now nearly 40 to 50 diseases that were unknown a generation ago and disease outbreaks – whether natural, accidental or deliberate in origin, are an increasingly salient national security concern.

Historically, literature on health and security has been scarce and only in the past few years a body of literature on health and security has emerged. At the nexus of health and security lie many poignant examples of the growing threat of biological weapons, the negative impact of naturally occurring infectious diseases, the migration and proliferation of emerging and reemerging infectious diseases to non-endemic areas that fabricate a strong case for including health concerns in the national security debate. Though, health and security have traditionally occupied separate domains, in recent years the imperative fusion between health and national security has been recognized by policymakers, security and defense analysts in both developed and developing countries. Conversely, many medical innovations and technologies currently used in emergency rooms and operating theatres have military origins. Breakthroughs in surgery, trauma care, circulatory access, prosthetics and rehabilitation have come from the field of battle or military R&D.

In Pakistan, the emergence and re-emergence of Chikungunya in Sindh province and spread of Chickenpox in Punjab province along with the dispersion of infectious diseases geographically throughout country demonstrate that Ministry of Health (MoH) and Ministry of Defense (MoD) are not incorporated and interconnected to address

the national health and security issues. Likewise, research and development (R&D) for new tools and technologies to prevent, detect and respond to emerging disease threats and outbreaks have not been considered with growing need in the country. As seen with the Chikungunya and Chickenpox outbreaks, there is a shortage of appropriate diagnostics and vaccines to manage the response and lack of regulatory framework for fast-tracking and surveillance technology, tools and techniques when respond is indispensable.

To cut a long story short, the link between infectious diseases and national security is relatively a new concept in Pakistan. A new paradigm is needed that link infectious diseases to national security and recognize the broad effects of diseases on our society. Response to infectious disease threats should be strategic priority of health and security agencies. Ministry of Defense (MoD) needs to acknowledge its role in ensuring that the state's population is fit and healthy since there are no signs that the Ministry of Defense (MoD) is awakening to this responsibility. At a time when our conceptions of national security are evolving rapidly, we must look hard at uncertain and non-traditional threats, exceptionally. With uncertainty and ambiguity, a large amount of work is needed to bring analytical clarity to the health and national security paradigm.

Published on: 25th May, 2017

Pandemic Terror - Securitizing The Global Health

Traditionally, the concept of security was narrowly confined in military position with the essential focus on state protection from threats to national interests. Nevertheless, in the not too distant past, efforts to link up global health and health security have lifted eyebrows from experts in both the areas. Arguments linking global health and health security have become patronize in the past few years. Accumulated concerns about the proliferation of biological weapons and the potential for bioterrorism have brought health security and public health more closer. The health-security nexus has become a dominating component within global health governance and global surveillance and response to infectious disease outbreaks. Though, debates on health-security nexus vary in levels of analytic thinking from the global to the national, infectious diseases could be incredibly conferred as a real terror to any state. A pandemic may not only cause social disruption but also, threaten the stability of a state by eroding confidence in the state's ability to provide a basic healthcare facilities and protection against diseases. Ideally, infectious diseases may not be the white-shoe, but it may provide the flash point turning a 'weak state' into a 'failed state'.

KNOWING THE RISKS ASSOCIATED WITH INFECTIOUS DISEASE OUTBREAKS IS NOT ENOUGH. POLITICAL DETERMINATION IS NEEDED TO PROTECT PEOPLE FROM THE CONSEQUENCES OF PANDEMICS AND TO BUILD A SAFER AND MORE SECURE WORLD.

For millennia, humans suffered and died from disease with no understanding or knowledge of the aetiology. Now and then historians transcribed conflicts and wars where infectious disease

outbreaks played a prominent role. Likewise, several historical approaches to combating disease - such as the quarantine practices of the late 14th century onwards - proved so effective that we continue to utilize equivalent methods today. For a time, following the collapse of the Roman Empire the trend was for people to avoid settling in urban environment. By the 12th century, this began to reverse that move towards increased urbanization and also brought with it greater risk of diseases. In 1377 the city-state of Venice that had been severely affected by the Black Death as it spread across Europe, introduced quarantine arrangements for the first time. Observing that the disease appeared to have arrived on ships carrying trade goods, the Venetian authorities mandated that all newly arriving vessels be prevented from unloading cargo or passengers for a period of 40 days, purportedly on the basis that it was the same length of time Prophet Christ and Prophet Moses (P.B.U.T) had spent isolated in the desert.

At the end of WWI one of the most devastating epidemiological events in recorded human history occurred in the form of the 1918 Spanish Influenza pandemic that killed approximately 40 million people worldwide. Moreover, several major epidemics of typhoid, cholera, malaria, and yellow fever had a demonstrable impact on military forces throughout WWII. However, the real threat that infectious diseases posed to the global community was extremely well recognized by 1948 at the time of the establishment of World Health Organization (WHO). Likewise, the connexion of the global health - health security acknowledged in the 1990s flows from four critical causes: (1) the devastating scale of the HIV/AIDS pandemic in the developing world; (2) the recognition of the global problem of emerging and reemerging infectious diseases; (3) renewed concerns about the proliferation of biological weapons by states; (4) increased fears about the use of biological weapons by terrorists.

Global health issues, especially from infectious disease outbreaks, have risen ever higher on the global political agenda in the past two decades. Surprisingly, new infectious diseases have been emerging at an accelerated average of one a year by the same time period. E.g., SARS (2002-2003), MERS (2012), Avian Influenza A(H7N9) (2013), Ebola (2014-2015), Zika (2015-2016), and COVID-19 (nCoV-2019-2020).

"It is likely that the world will continue to face outbreaks that most countries are ill positioned to combat. In addition to climate change and urbanization, international mass displacement and migration - now happening in nearly every corner of the world - create ideal conditions for the emergence and spread of pathogen". - *The Global Health Security Index, 2019.* Knowing the risks associated with infectious disease outbreaks is not enough. Political determination is needed to protect people from the consequences of pandemics and to build a safer and more secure world. Today is high time for presidents, prime ministers, parliamentarians, and health policy-makers to recognize that every nation's security depends on global health security and that requires sincere, consistent, and long-run planning to make the world better equipped to respond pandemic terror. What is unfortunately guaranteed if history is any guide, is that adverse infectious disease outbreaks will continue to visit globally and securitizing global health is one of the best tools to address them.

Published on: 26rd March, 2020

Is Government Of Pakistan Really Prepared To Cope With Infectious Disease Outbreaks?

The speed at which the science and technology related to the healthcare challenges are moving is hard to exaggerate. It is happening at a rate faster than the well-known Moore's Law in information technology. The rate at which the health sciences and its associated technologies are progressing and knowledge of the practice of healthcare is advancing has led commentators to suggest that the health sciences are undergoing a profound revolution. The expansion of knowledge in the health, however, is not only rapid, but it is also deep, broad in that it encompasses a wide range of disciplines, and widely available.

PAKISTAN DOES NOT HAVE AN EFFECTIVE INFECTIOUS DISEASE SURVEILLANCE SYSTEM AND UNFORTUNATELY, IT IS OFF TRACK IN MEETING THE SUSTAINABLE DEVELOPMENT GOALS (SDGS) OF HEALTHCARE.

Health plays an influential role in fostering economic growth and sustainable development. Because of its indirect impact on human development, better health boosts rates of economic growth and contributes to wealth creation. In the past decades, new healthcare challenges and emerging infectious disease outbreaks have drawn global attention particularly in developing countries like Pakistan. Similarly, emergence and reemergence of mosquito-borne infections such as dengue, chikungunya, zika, and more virulent forms of malaria and new more severe forms of viral respiratory infections have evolved. Pakistan is one of several countries, which together bear 95% of the burden of infectious diseases, and the trend is on the rise. Infectious diseases are a distinct group of illnesses that are caused my

microorganisms, such as viruses, bacteria, fungi or parasites and can spread between individuals.

According to statistics, Pakistan had not been able to control the burden of communicable diseases like tuberculosis, malaria, dengue fever, typhoid, hepatitis, cholera and other infectious diseases. Malaria, dengue, polio, and tuberculosis, are among the top killers. Pakistan is ranked fifth on the list of high-burden TB countries, and worst of all; Pakistan is one of the three remaining countries where poliomyelitis, also called polio, is still endemic. An average of about one million lives claimed yearly by malaria (estimated 12% of the rural population is believed to carry malaria parasites in their blood) and anticipated mortality rate of 48 thousand deaths per year as a result of TB cases. Similarly, infectious diseases are the biggest killers of children in Pakistan, causing 60% of all child deaths under 5 years of age.

Pakistan does not have an effective infectious disease surveillance system and unfortunately, it is off track in meeting the Sustainable Development Goals (SDGs) of healthcare. However, an Electronic Disease Early Warning System (e-DEWS) was created in 2005 through the collaboration of World Health Organization (WHO) and the Federal Ministry of Health with the goal of early detection of infectious pathogens to reduce the morbidity and mortality rate, but regrettably it was not implemented at the grassroots level. Recent outbreaks of dengue, chikungunya and other infectious diseases across the country raise questions about the efficiency of e-DEWS.

Correspondingly, the structure and function of the current healthcare system in Pakistan are far below international standards and ranked at 122 out of 190 countries in terms of healthcare standards. Pakistan does not have an organized healthcare system; even health priorities

are not properly defined by present government. Government of Pakistan needs to work out an extraordinary strategy for the challenges ahead, as it continued to witness the burden of infectious diseases since infectious diseases are a real public health threat, and outbreaks can have serious social, political, economic and national security consequences. Core health issues such as infectious disease outbreaks should be addressed to formulate a potential health policy that could be implemented at the grassroots level for efficient execution.

In a nut shell, Pakistan faces numerous challenges in healthcare, which can be broken down into social issues, technical constraints, lack of trained human resources, infrastructure, effective legislation and policymaking, awareness and negligence. As a result, Pakistan faces many challenges in implementing the health-related SDGs. The lack of reliable and recent health data is another serious issue together with the weak institutional capacity, which has led to poor governance and policy incoherence. There is no evidence of strong political will, and interministerial conflicts are rampant to cope with infectious disease outbreaks. In order to control healthcare issues, corruption must be stopped – one of the major causes of not being able to cope with infectious diseases outbreaks efficiently. Pakistan has been declared to be among the leading countries with a corrupt health system. Corruption is one the rise in every aspect of healthcare, including funds allocation (especially funds allocated to local NGOs), drug pricing and regulation, immunization programs etc. Unless these issues are properly addressed, the government of Pakistan may not contribute well to achieve the SDGs by 2030.

Published on: 17th March, 2019

Infectious Diseases And National Security: Who Will Frame National Health Security Policy Of Pakistan?

Health plays an influential role in fostering economic growth and sustainable development. Because of its indirect impact on human development, better health boosts rates of economic growth and contributes to wealth creation. In the past decades, new healthcare challenges and emerging infectious disease outbreaks have drawn global attention particularly in developing countries like Pakistan. Traditionally, health and security occupied separate domains, but in recent years the imperative fusion between health and national security has been recognized by policymakers, security and defense analysts in both developed and developing countries. The last two or three decades have seen sharp rise in non-traditional threats to national security, such as infectious diseases. There are many lines of attack that infectious diseases can intimidate national security i.e. increased rates of morbidity and mortality, massive damage on public health and health infrastructure, political instability, and economic volatility.

HEALTH SECURITY HAS BECOME A NATIONAL PRIORITY IN MANY COUNTRIES, SUPPORTED BY LOYAL AND DEVOTED LEADERSHIP. THEY ARE APPROACHING HEALTH SECURITY IN A HOLISTIC MANNER, INCLUDING, SOCIAL, TECHNICAL, ECONOMIC, DIPLOMATIC, MILITARY AND INTELLIGENCE-RELATED ASPECTS. ON THE CONTRARY, THE LINK BETWEEN INFECTIOUS DISEASES AND NATIONAL SECURITY IS RELATIVELY A NEW CONCEPT IN PAKISTAN.

Emerging and reemerging infectious diseases, and their pandemic potential, pose a challenge to national security in the 21st century that cannot be overlooked. Though, the historical threat to national security by epidemic diseases is not new; the threat has increased in recent past and is growing rapidly in Pakistan. Correspondingly, reemergence of mosquito-borne infections such as dengue, chikungunya, zika, and more virulent forms of malaria and new more severe forms of viral respiratory infections have evolved. Pakistan is one of several countries, which together bear 95% of the burden of infectious diseases, and the trend is on the rise. According to statistics, Pakistan had not been able to control the burden of communicable diseases like tuberculosis, malaria, dengue fever, typhoid, hepatitis, cholera and other infectious diseases. Malaria, dengue, polio, and tuberculosis, are among the top killers. Pakistan is ranked fifth on the list of high-burden TB countries, and worst of all; Pakistan is one of the three remaining countries where poliomyelitis, also called polio, is still endemic. An average of about one million lives claimed yearly by malaria (estimated 12% of the rural population is believed to carry malaria parasites in their blood) and anticipated mortality rate of 48 thousand deaths per year as a result of TB cases. Similarly, infectious diseases are the biggest killers of children in Pakistan, causing 60% of all child deaths under 5 years of age.

At present, Pakistan is facing multiple challenges in healthcare, which can be broken down into social issues, technical constraints, lack of trained human resources, infrastructure, effective legislation and policymaking, awareness and negligence. The structure and function of the current healthcare system in Pakistan is far below international standards and ranked at 122 out of 190 countries in terms of healthcare standards. Pakistan does not have an organized healthcare system; even health priorities are not properly defined by present government (except Health-card). There is no evidence of strong

political will, and inter-ministerial and inter-departmental conflicts, corruption, awful governance, and lack of correspondence are rampant to cope with national health security issues.

Epidemiologically, the behavior of epidemic is usually compared to previous outbreaks. The reemergence of Dengue virus (year-to-date, thousands of dengue cases are reported and hundreds of deaths in last few months) along with the dispersion of infectious diseases geographically throughout Pakistan demonstrate that Ministry of Health (MoH) and Ministry of Defence (MoD) are not incorporated and interconnected to address the national health security issues. Likewise, research and development (R&D) for new tools and technologies to prevent, detect and respond to emerging disease threats and outbreaks have not been considered by authorities with growing need in the country. As seen with the Dengue and Chikungunya outbreaks, there is a shortage of appropriate diagnostic equipment and vaccines to manage the response and lack of regulatory framework for fast-tracking and surveillance technology, tools and techniques when rapid respond is indispensable.

To cut a long story short, health security has become a national priority in many countries, supported by loyal and devoted leadership. They are approaching health security in a holistic manner, including, social, technical, economic, diplomatic, military and intelligence-related aspects. On the contrary, the link between infectious diseases and national security is relatively a new concept in Pakistan. A new paradigm is needed that links infectious diseases to national security and recognize the broad effects of diseases on society. Response to infectious disease threats should be strategic priority of health and security agencies in Pakistan. Ministry of Defence needs to acknowledge its role in ensuring that the state's population is fit and healthy since there are no signs that the Ministry

of Defence is awakening to this responsibility. At a time when our conception of national security is evolving rapidly, we must look hard at uncertain and non-traditional threats, specifically. Today, Pakistan is facing a wide range of threats to national health security, including disease outbreaks and pandemics. As health threats are evolving, protecting Pakistan from 21st century health security threats need a clear strategic direction and teamwork between Ministry of Defence and Ministry of Health. Of course, with uncertainty and ambiguity, a large amount of work is needed to bring analytical clarity to the national health security paradigm.

Published on: 16th September, 2019

Health Info Systems For Policy And Decision Making

To provide optimal care, healthcare institutions need timely patient information from various sources at the point-of-care, and need a comprehensive, complete and fully functional system to fulfill all these needs. Reliable and timely health information is an important element in health information system development. Collection of pertinent data and its related analysis to provide compulsory evidence for assessing the development and performance of health systems at national and sub-national levels is a major responsibility of any health information system. The purpose of a health information system is to improve the ability to collect, store and analyze accurate health data, service delivery efficiency, improve data accuracy, effectiveness of intervention, increase accountability and learn about developments.

HIS INVESTMENTS HOLD THE PROMISE NOT ONLY OF TRANSFORMING PUBLIC HEALTH, BUT ALSO OF ACCELERATING PROGRESS TOWARDS GOOD GOVERNANCE IN HEALTH SECTOR.
IF THE HIS IS NOT GENERATING LEGITIMATE AND ACCURATE INFORMATION, WE WILL NOT BE ABLE TO KNOW ABOUT THE FACTUAL PERFORMANCE OF THE HEALTHCARE SYSTEM, INCLUDING ITS PUBLIC HEALTH COMPONENT.

The intention of the health information system is to record information on health events and check the quality of services at different levels of healthcare. The health information system can be compared to the nervous system of the human body as the human body cannot function unless the nervous

system is properly and synergistically giving the right electrical signals through the medium of different chemicals or enzymes in the human body. Similarly, the proper and systematic functioning of the health information system requires good coordination of its components, starting from the data gatherers at the most peripheral level of the health system up to the central Ministry of Health level. If the health information system is not generating legitimate and accurate information, we will not be able to know about the factual performance of the healthcare system, including its public health component.

Health management information systems or health information systems are the systems used to collect, analyze, retain, retrieve and evaluate health information. The WHO (2005) article on *"Issues in Health Information"* adds to this definition by stating that a health information system integrates all the data needed by policy makers, clinicians and health service users to improve and protect population health. Health information systems generally express one of these several separate subsystems containing data:

- Disease surveillance and outbreak notification;
- Data generated through household surveys;
- Registration of vital events and censuses (births, deaths and causes of death);
- Data collection based on patient and service records and reporting from community health workers, health workers and health facilities;
- Programme-specific monitoring and evaluation (for example: TB, HIV/AIDS, and EPI);
- Administration and resource management (including budget, personnel, and supplies).

Good decisions, effective policies, services, and behaviors require timely, accurate, and relevant information. Information is a means to the end of improving health, but the availability and accessibility of consistent information does not guarantee its use or improved decision making. Since decisions are often obsessed as much by politics as by evidence, it is critical to design information systems to meet the needs of decision makers and to create a culture of evidence that provides incentives and accountability for evidence-based decision making.

Presently, there is a need to improve the access to information and knowledge in the developing countries like Pakistan. Research in the health information systems will be influential in both accelerating equitable access of information and improving the management and use of knowledge for improved health. Investments in comprehensive development of the HIS can accelerate broad improvements in health if they are engineered to reflect, reinforce, and even drive health sector reforms. HIS investments hold the promise not only of transforming public health, but also of accelerating progress towards good governance in health sector.

Published on: 25th November, 2013

Scientization Of Democracy – The Science & Policy Nexus

"Unless scientists and policymakers learn to work together effectively, both domains will suffer." **– Lewis M. Branscomb**

What role does science play in the government? What is the role of science in relation to policymaking? Democratic societies make policies and decisions based on various inputs, including, economic considerations, societal standards, general public views, and the principles and vision of the government of the day. As we enter the 21st century, policy making is taking place in a decidedly dynamic environment. The emergence of the knowledge-based society has emphasized the significance of sound 'Science Advice' as a key input to policy formulation. In an environment which is persistently becoming more complex, ministers, member of parliaments and other policymakers are anticipated to presume scientific evidence and judgment when designing policies.

SCIENTIFIC ADVICE PLAYS AN IMPORTANT ROLE IN THE DEVELOPMENT OF POLICIES IS MOST DEVELOPED COUNTRIES.

POLICYMAKERS REQUIRE SOUND SCIENTIFIC INFORMATION IF THEY ARE TO MAKE DECISIONS.

Whatever the issue may be – pressure on the supply of energy, food and water, health, security, climate change, genetically modified crops, biological and chemical weapons, biosafety and biomedicine, cybercrime, cyber-terrorism, civil use of nuclear power – scientific expertise present an elemental root for policymaking. Science-based policymaking has grown ever more significant in recent years alone

with the dramatic increase in the complexity and uncertainty of the ways in which science and technology interact with society. As the world around us becomes increasingly complex, disruptive technologies and social innovations are changing our way of life at an accelerating speed, and policymaking is not immune to this. Therefore, decision-making increasingly depends on advice given by science and technical experts in order to deliver the most innovative and effective policies.

Thanks to modern information and communication technologies, evidence can now be delivered in real time and from a multitude of sources. This also creates new opportunities for the involvement of citizens in policymaking. Scientific advice plays an important role in the development of policies is most developed countries. In Pakistan, scientific experts should be involved in providing advice not only on S&T but also, regulatory or general policies. Since, policymakers require sound scientific information if they are to make decisions. In this regards, the government may perform the following roles:

- Government should establish effective mechanisms for ensuring appropriate and timely scientific advice and define clear and transparent frameworks and rules of procedure for their advisory processes and mechanisms.
- Government should implement measures that build societal trust in science for policymaking and work with international organizations to ensure coherence between national and international scientific advisory mechanisms related to complex global challenges.
- Government should take a strategic approach to the prioritization, accessing, resourcing and delivery of science and technology and ensure effective knowledge transfer.

- Government should continue its efforts to strengthen good governance, with the emphasis on scientific development and give priority to fight against corruption and nepotism throughout National ST&I policy.

Indeed, science in an extensive array of fields is genuinely built into the everyday operations of today's government. Science-based policymaking has grown ever more important in both developed and developing states, since, living standards, employment and quality of life depend progressively on the exploitation of investment in scientific knowledge. The rapid developments of the modern world in regard to technical and technological capabilities results in a particularly high demand for well-informed political decision-making. Likewise, people rightly expect politicians to be honest with facts when they decide about public policies and future scenarios. Consequently, in Pakistan, there is an escalating obligation from policymakers for science advice because scientific evidence may help to manage risks and facilitate them to formulate better and effective regulatory and legislative decisions. This is why scientific knowledge and evidence is an essential prerequisite in policy processes, and policy makers must duly respect advice from scientific community. Installing a proper framework for ensuring the integrity and trust in science is becoming an urgent task for policymakers in country. In doing so, it will add not only to the history of ingenuity but also to the thoughts of democratic system.

Published on: 27th April, 2016

Health

Pak-Sino Health Tourism: A Win-Win Model For CPEC

"If the "Belt and Road" are likened to the two wings of a soaring Asia, then connectivity is like arteries and veins." **– Xi Jinping**

China's ambitious plan to stabilize its western periphery through the Belt and Road Initiative (BRI) has at its core the China-Pakistan Economic Corridor (CPEC). China's progress-solidity nexus epitomizes one of the main drivers behind CPEC. CPEC is a framework of geographical connectivity linked through the BRI, which is not for the benefit of China and Pakistan but for all the countries involved in the initiative and anticipated to provide regional development, economic growth and peace through win-win model. Moreover, the project is expected to create at least 700,000 direct jobs and serve as a springboard for the development of industries such as retail, education, health and tourism etc.

HEALTH TOURISM HAS GROWN IN A NUMBER OF NATION-STATES ESPECIALLY IN ASIAN STATES.

HEALTH TOURISM IS PROBABLE TO INCREASE EVEN FASTER IN THE FUTURE AND THE NUMBER OF COUNTRIES SEEKING TO DEVELOP HEALTH TOURISM INDUSTRY AS IT IS AN EMERGING GLOBAL INDUSTRY.

By the start of this century, world is rapidly progressing toward globalization. The globalization of healthcare has also given rise to an innovative trend called "Health Tourism". It's also called "Healthcare Globalization" or "Health Vacation". Whatever you name it, health tourism is mounting and diversifying on a global level and the global

health tourism market was valued at $15.5 billion in 2017, and is estimated to reach at $28.8 billion by 2024 and Asian health tourism market is anticipated to cross $14 billion mark by 2022. Health tourism is a swiftly evolving trend and the fastest growing sector not only, in developed nations but also, in developing nations. Health tourism is becoming a worldwide, multibillion-dollar industry and recent trend illustrate that people from developed countries are traveling to developing countries for affordable healthcare. In the last decade, the perception of wellbeing has gone further than ever before, thus, health tourism has emerged as an industry, where people travel often long distances to overseas countries to obtain medical, dental and surgical care while at the same time being holidaymakers. The phenomenon has developed significantly in recent years mainly due to the high cost of treatment and long waiting list in developed countries.

Health tourism has grown in a number of nation-states especially in Asian states. The chief regions in Asia are Thailand, India, Malaysia, Singapore and South Korea. Thailand accounts for maximum share of the Asian health tourism market, being followed by India and Singapore. Likewise, based on the Sixth Economic Development Plan (2017-2022), Iran is projected to attract 600,000 health tourists every year with ultimate goal to earn $25 billion a year through tourism by 2025, around $2.5 billion of which will come from health tourism. Health tourism has also boomed on the Chinese mainland over the past few years and China is fast emerging as a desirable destination for seeking medical care. American, European and Canadian patients favor India, Thailand and Malaysia. Thailand became famous as destination for health tourism as early as the 1970s because it specialized in sex change operations, and later moved into cosmetic surgery. Currently, Thailand is home to an ever-increasing number of cosmetic surgery and related services providers including liposuction,

facelifts and anti-ageing treatments. In India, heart-related diseases and organ transplantation are being treated at outstanding facilities at rates that are competitive globally. In all these cases, the low cost of quality healthcare services is a major driving force behind the rising trend of health tourism to these destinations. Malaysia became involved in health tourism industry after 1998 and now emerging as a major destination for those seeking knee cap replacement, spinal fusion and other joint-related surgeries and medical procedures. Dubai also has built Healthcare City (DHCC) to capture the Middle Eastern market and divert it from Asia. The DHCC, "the world's first healthcare free zone" strategically located between Asia and Europe is a highly regulated institution that aims to provide high-quality healthcare, medical education and research in region.

Health tourism is probable to increase even faster in the future and the number of countries seeking to develop health tourism industry as it is an emerging global industry. CPEC could play a key role in mutual cooperation between Chinese and Pakistani health tourism industries. If health tourism model comes to fulfillment, the multi-billion dollar industry may drive even greater change to both states. Pakistan has a huge potential to become a regional health tourism hub like other neighboring countries as Pakistan is rich in doctors and technical staff of international reputation in their respective fields. In near future Pakistan may have potential to develop health tourism if the coordination between Ministry of National Health Services & Regulations, Ministry of Foreign Affairs and Ministry of Tourism/Pakistan Tourism Development Corporation (PTDC) be established. It is also fact; health infrastructure in Pakistan is much below expectations and international standers due to poor health governance, lack of health financing, lack of centralized health policy and corruption in health sector. In this regard, the Government of

Pakistan and policy makers may instantaneously act on the following recommendations:

- Devise the health tourism based health policy and clear position to health tourism as the new axis. Produce policy papers on subjects arising in health tourism.
- Integrate a health perspective into tourism policy and create an information platform for health tourism.
- Establish the coordinating office for health tourism to highlight the connection between health, social and economic development.
- Start a health tourist visa category and reduce the brain drain phenomenon within the country.
- Continue its efforts to strengthen good governance including health governance, with emphasis on merit based institutional development and the rule of law. And, exceptionally eliminate corruption and nepotism from the society.

Published on: 12th October, 2018

Chinese Pneumonia Outbreak (2019-nCoV) – An Emerging Threat To Global Public Health?

"People's live and health should be given top priority and the spread of the outbreak should be resolutely curbed". **– President Xi Jinping**

After decade of neglect, infectious diseases (IDs) have re-emerged as a field of inquiry in the area of global public health and health security. Gradually, the world has come to realize the threat of emerging IDs. Human history is abundant with stories of epidemic infections. Epidemiologically, IDs tend to follow a cyclical pattern, since they often produce immunity in survivors, and microbes await a new generation of hosts to infect. On the other hand, the disease-causing viruses or microorganisms migrate to geographically distant and immunologically vulnerable inhabitants, producing a pandemic, or regional and global outbreak. The historical relationship between the humanity and IDs is fascinating and noteworthy. IDs plagued civilizations long before the development of territorial states during the European Renaissance. Subsequently, epidemic diseases shaped human history, generally, and military conflict, in particular. During the Peloponnesian Wars, disease demoralized the Athenian people, weakened the army, and undermined the political leadership. Subsequently, more than 2,500 years later, the 1918 influenza epidemic killed 25 million people, including 500,000 Americans. The Spanish flu struck 294,000 allied troops in the fall of 1918. Moreover, the 1918 flu pandemic killed 50-100 million, which is more than the combined total casualties of World War I and II.

Until the early twentieth century, plague, smallpox, influenza, and other scourges decimated human populations around the world. Despite exceptional improvement in pandemic control, IDs remain a major threat to global public health. In 1998, 13.3 of the 53.9 million

deaths worldwide, or 25 percent of all death, resulted from IDs. Historically, some major disease outbreaks in China, including the 1957 Asian flu, the 1968 Hong Kong flu, and the 2002/03 SARS (Severe Acute Respiratory Syndrome) epidemic, have triggered epidemics elsewhere in the world, killed approximately 800 people around the world. In total, SARS infected more than 8,000 people in 26 countries. As demonstrated in the SARS epidemic, the new strain of coronavirus (2019-nCoV), which causes a type of pneumonia that has not previously been identified in humans, resulting spillover of disease outbreaks in China and neighboring countries.

The 2019/20 novel coronavirus outbreak, also known as the Chinese pneumonia outbreak or the Wuhan coronavirus, is a viral outbreak that was initially identified during mid-December 2019. Chinese authorities identified the new coronavirus has resulted approximately 500 confirmed cases in 13 provincial-level regions in country, and additional cases being identified in a growing number of countries internationally. On January 21, 2020, the first case in the United States was also announced. Confirmed cases have also been reported in Macau, Hong Kong, Japan, Thailand, South Korea and Nepal. As of January 22, 2020, nine deaths have occurred all in China. Thus, 2019-nCoV may have serious implications on stability, prosperity, and health security at the global level. Factually, we have now entered in a new era characterized by the dreadful consequences of decade of negligence of IDs at the global level. There is a great desire to know what the future of IDs will bring, and also to know how we should behave in the future to minimize the IDs outbreaks and casualties. Now is the high time to realize that we are in darkness than to pretend that we can see the light.

Published on: 23rd January, 2020

Modern Medical Ethics: Critical Issue For The 21st Century

"If we believe men have any personal rights at all as human beings, they have an absolute right to such a measure of good health as society, and society alone is able to give them" **– Aristotle**

Health systems as defined by World Health Organization (WHO) "all the activities whose primary purpose is to promote, restore or maintain health". When we move into the 21st century, the promotion and protection of human rights is gaining greater momentum. The WHO constitution 1946 stated "The enjoyment of the highest standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition".

Patients, families and healthcare professionals occasionally face complicated decisions about medical treatments. These decisions may clash with a patient and/or family morals, religious beliefs or healthcare plan. In this risky situation medical ethics is not only considerate review of how to act in the best interest of patients and their family but also about making good choices based on beliefs and values regarding life, health, and suffering. In the past, only a few individual physicians devoted themselves to medical ethics. Beginning in the second half of twentieth century, the field undergoes explosive expansion and experts from numerous disciplines entered in medical ethics. The swift advances in medical diagnosis and treatment and the introduction of new technologies

WITHIN CANADA, EU, UNITED STATES, AND SOMEHOW GULF COUNTRIES, MODERN MEDICAL ETHICS HAS EMERGED AS A NEW PROFESSIONAL.

have created numerous new ethical problems, resulting in the maturation of medical ethics as a specialty in its own right.

Enormous development has been achieved in the medical field during the last few decades and more is projected in the following decades. Advances in diagnostic imaging and biological testing techniques as well as in medical forecasting based on genetic testing are ongoing. Advances in surgical and medical cures, organ and tissue transplantation, artificial organs, cloning, tissue culture techniques, molecular biology and information technology are reported almost daily. "Modern Medical Ethics" is based on concept derived from various disciplines, including the biomedical sciences, the behavioral sciences, philosophy, religion and law. Modern medical ethics is essentially a form of applied ethics, which seeks to clarify ethical questions that characterize the practice of medicine and to justify and weigh the various practical options and considerations. Thus medical ethics is the application general ethical principles to ethical issues. The application of such an ethic is not specific to medicine but also relates to economy, law, journalism, and their like.

Medical ethics is now not only part of the curriculum in institutes of the health professions in developed countries but also research institutes of medical ethics have been established at all levels. In developed nations the medical literature has proliferated, with numerous books and journals devoted entirely to the subject. In such countries common citizen is also vitally interested in this subject, and public lectures, newspaper articles, legal discussions and legislation on medical ethical issues are frequent. Within Canada, EU, United States, and somehow gulf countries, Modern Medical Ethics has emerged as a new professional. The individuals normally have specialized in one or more the fields of philosophy, ethics, law, religion and medicine, and serve as advisor in hospitals to physicians,

patients and their families. They also effort to resolve difficult ethical questions posed to them by the medical team or by patients and their families.

Time has revolutionized the healthcare practice, and patients are more attentive of their healthcare rights. In Pakistan patients have now begun to question their physicians for their right to know their options, their planned treatment and possible obstacles. Because of the need in modern medicine to be knowledgeable in medical ethics and because medical students are exposed to medical ethical issues throughout their medical studies, it has become necessary to teach Modern Medical Ethics in colleges and universities of the health professions. The Pakistan Medical and Dental Council (PMDC) curriculum noticeably advices the teaching of medical and healthcare ethics to medical students however, like many other topics e.g. management sciences, information and communication technology, health ethics is also not properly taught in most of the medical institutes of country. There is a need to develop an ethical culture in Pakistan and it is best time that PMDC should make it obligatory for all medical institutes to include Modern Health Ethics in the syllabus. Similarly, medical universities and colleges across country should take initiatives in training their graduates and postgraduates to prepare them for facing and managing modern ethical issues in clinical practice. Governments should also sensitize their own decision-making procedures in the light of ethics. Ethics, equity and respect for human rights must be incorporated in all aspect of health care.

Published on: 3rd December, 2012

Importance Of Biomedical Engineering In Pakistan

The 21st century is technically called the Biological Century. World is changing globally step by step and the modern era is having the application of engineering in almost every field of science especially biological science. More technological advancement in the medical and industrial area is predictable with heavily funded research programs ongoing in most countries of the world. Development in the field of biology and medicine, such as human genome sequencing and research to create cell and organ functions, have led to a serious change in many industrial segments and strengthened the medical engineering profession. Although the conventional areas of engineering and other technology innovations will continue, more new opportunities will come up in Biomedical Engineering and in the field of biology, medicine, health and delivery of healthcare. The Biomedical age is still in the embryonic stage, rising steadily as we proceed to develop the field of Biomedical Engineering.

A WELL ESTABLISH HOSPITAL CANNOT OFFER QUALITY OF HEALTHCARE WITHOUT HAVING BIOMEDICAL ENGINEERING DEPARTMENT.

BIOMEDICAL ENGINEERS CAN PROVIDE RECOMMENDATION AND SUPERVISION IN THE SELECTION OF MEDICAL EQUIPMENT AND THEY CAN ALSO MANAGE THE PERFORMANCE OF THE EQUIPMENT ON A CONTINUOUS BASIS.

Pakistan, like many other developing countries, is facing tribulations in health care deliver. The health system in Pakistan is currently going

through several reforms at the federal, provincial and district level particularly to improve the delivery of health service to the population. Although, our nation's health care providers – surgeons, physicians, nurses, and others work hard to provide life-saving and life-improving care to millions of Pakistanis but, the level of quality and efficiency of care varies significantly across the country. Good health as people know from their own experience is a critical part of well-being. With growing healthcare awareness, increase in population and greater affordability for optimized healthcare, the need for qualified Biomedical Engineering professionals is increased in Pakistan therefore; the suitable and applicable structure is required to bridge the gap between medical technology and patient care. Currently, the status of Biomedical Engineering in Pakistan is far from satisfactory. Federal and Provincial government should make some policies to introduce Biomedical Engineering departments in hospitals and other healthcare centers. Biomedical Engineers can play a key role in the delivery of healthcare both in private and government sectors.

In Pakistan, Biomedical Engineers must be employed in universities, industry, hospitals, research centers for education and medical institutions, teaching and government regulatory agencies. Biomedical Engineers must be employed in government positions for product testing and safety, besides establishing safety standards for devices. In hospitals environment, Biomedical Engineers can provide recommendation and supervision in the selection of medical equipment and they can also manage the performance of the equipment on a continuous basis. A well establish hospital cannot offer quality of healthcare without having Biomedical Engineering department, particularly hospital that is involve into secondary and tertiary care, because such hospitals are full of medical equipment, instruments, devices, and machinery that can be operated, calibrated

and maintained by Biomedical Engineers through appropriate and skilled manners.

Consequently, Biomedical Engineering has a huge impact on the world we live in today. There are now an array of medical devices and machines that can both improve health and save lives. Indeed, medical care will be strongly influenced by the revolutionary changes brought about by Biomedical age in term of quality, technology, cost, and life style specially in developing countries like Pakistan. Medical care in the Biomedical age will flexibly meet individual, diversified, and comprehensive needs. Biomedical Engineering must adjoin with doctors and healthcare providers in Pakistan for better health.

Published on: 6th August, 2012

GIS: An Imperative Tool For Healthcare Planning

"We have enough water, enough food, enough money; we have enough of everything except the ability to agree and move forward." **– Abdul Kalam, former President of India.**

During the past decade, Geographic Information System (GIS) applications have tended to focus upon eight major models: agricultural, climate impact, health, parasitology, pesticide, pollution, waste management and wildlife management. Health topics addressed in a GIS format included: commuter safety, environmental health decisions, health data maps, mapping of health service providers, population growth, disease cluster identification, geographic access to healthcare and geographic epidemiology. While GIS studies in health have been varied and innovative, they also have tended to be inconsistent, especially in their application to and maintenance of regional needs in healthcare planning.

Health Care Planning and GIS are two relevant fields that depend upon spatial data. Health care facilities at any region can be divided into two main types such as primary health centers and hospitals and location of health facilities, patient distribution and characteristics are example of spatial data analysis that is dealt with during local health planning. Health planners use spatial data to monitor and evaluate health services on local areas such task can be better made using different GIS functions and models. Health authorities have always aimed to provide health care for all residents using a fair access policy that is characterized as providing the right service at the right time in the right place.

The area of GIS and health care has risen to prominence in the past 10 – 15 years with the recognition that health surveillance practices and

health service allocations need to become more sensitive to the needs of people in local geographic areas. The collection, storage and manipulation of geographic information have undergone a revolution in recent years with the development and wide spread availability of GIS software's. Today, many health care administrators and planners can benefit from education and training in the GIS field and this will give them the chance of influencing the advancement of health surveillance, environmental health assessment and the geographic allocation of health resources.

GIS has also continued to be used in public health for epidemiological studies via tracking the sources of disease and the movements of contagions, agencies can respond more effectively to out breaks of disease by identifying at risk populations and targeting intervention. Public Health use of GIS includes tracking child immunizations, conducting health policy research; and establishing service areas and districts. Today, many health authorities have implemented health management and information systems to manage their different tasks. These systems can be used with the GIS to have a complete health information system that should contain the following elements:

- Environmental, socio-economic and other risk factors, which influence health, under serviced, poor, inaccessible areas and other geographic and demographic factors.
- Perceived health problems with incidence rates.
- Population sub groups with specific health problems, health needs and demand.
- Health services directed at health problems or risk factors for all or part of the population.
- Health care inputs, e.g. staff, funds, capital resources, medicines and equipment used etc.

- Health care outputs, e.g. number of client contacts, proportion of population reached for particular programmes and proportions of target population reached.
- Health care outcomes e.g. change in health status as a result of intervention of health care programs.

Information technologies have provided the means for integrating and analyzing diverse data sources in a spatial-temporal context. This approach supports the development of predictive models and timely intervention. Online media capabilities and the increasing number of application portals provide opportunities for governments, healthcare organizations, businesses, and individuals to devise creative solutions to persistent health problems of individuals, communities, nations, and the world. The realities of differing socioeconomic, educational, cultural, health, and medical care system, must provide the contextual basis for assessing the potential benefits that can be realistically achieved through the use of information technologies. These variations apply to geographic regions and population segments in the Pakistan as they do to various developed and developing countries. Indeed, the fundamental health challenges ahead is to transform information, specifically unfiltered and widely available health information, into knowledge that can be used to promote the health and well-being of people locally and globally.

Published on: 7th November, 2014

Geo-Informatics Technology In Healthcare Practice

Healthcare systems represent hearty and demanding information environment that requires comprehensive infrastructure capable of addressing inadequacies in existing systems. Although several modern information, communication and geo-technologies have been available for over three decades, most health-care systems and public health agencies have incorporated only a limited number of these innovative technologies into their routine practices. Understanding geo-informatics capabilities in health-care industry as a decision support system in responding to health-care challenges associated with assessment, assurance, and policy development is needed. Geographic information systems (GIS) and analyses based on GIS have become widespread and well accepted. GIS is not the complete solution to understanding the distribution of disease and the problems of public health but is an important way in which to better illuminate how humans interact with their environment to create or deter health. Geography is important in understanding the dynamics of health causes and spread of diseases. Any attempt to advance quality improvement in health-care requires geospatial

GIS PROVIDES THE OPPORTUNITY OF LINKING DATABASES TO MAPS, CREATING VISUAL REPRESENTATION OF STATISTICAL DATA, AND ANALYZING HOW LOCATION INFLUENCES FEATURES AND HEALTH EVENTS ON THE EARTH'S SURFACE.

GIS INTEGRATES DATA FROM MULTIPLE SOURCES, PROVIDING THE ABILITY TO ANALYZE AND VISUALIZE HOW DATA RELATES OVER SPACE AND TIME.

consideration and implementation of geo-informatics science and technology system (GIS), global positioning system (GPS), and remote sensing applications. Recent progress in geo-technologies has intensified the need for evidence-based spatial decision support systems (SDSS) in health-care practices. A GIS integrates data from multiple sources, providing the ability to analyze and visualize how data relates over space and time. The use of GIS requires the creation of geospatial database, appropriate hardware and software acquired, applications developed, and all components installed, integrated and tasted before users can use it. Health geo-informatics combines spatial analysis and modeling, development of geo-databases, information systems design, human-computer interaction and networking technologies to understand the relationship between people, environments, and health effects. GIS provides the opportunity of linking databases to maps, creating visual representation of statistical data, and analyzing how location influences features and health events on the earth's surface.

Within the last decade, the world has experienced some catastrophic events that clearly provide evidence of the importance of state-of-art health information system (HIS). Compared with other public services as natural resource, urban planning and transportation, it is evident that the full capacity of GIS in health-care management has not been fully explored. There is limited evidence that GIS are being formally considered or regularly used in strategic decision-making in any major health-care planning system. Several initiatives that advocate the inclusion of GIS operations at different stages of health-care planning and management have been noticed. In 2003, GIS was recognized as an emerging information technology that can be used to enhance the ability to prepare for and respond to public health emergencies. Several organizations including the WHO are committed to support countries in the adaptation and integration of

GIS within their respective health-care programmes. Successful adoption of GIS by health-care managers and policy-makers depends on understanding the spatial behaviors of health-care providers and consumers in the rapidly changing health-care landscape and how geographic information affects these dynamic relationships. In most cases, linking emergency resources with victims creates a geo-logistical challenge. To address this challenge, an integrated Advanced Emergency Geographic Information System (AEGIS) can be developed and accessed anywhere. AEGIS allows all emergency resources to be fully coordinated as a web-based situational awareness system for use in all emergency medical services. AEGIS monitors and maps the location and status of emergencies, locates victims and emergency response personnel, and tracks other factors such as prevailing weather conditions that can impact emergency response on a real-time basis. AEGIS overlays traffic congestion and accidents on freeways to plot the fastest routes to area trauma centers. All authorized emergency responders can access AEGIS via the Web or by using a basic cell phone or in-vehicle unit.

Developing a GIS requires investment in computer hardware, GIS software, networking environment, data procedures, and trained staff. Staffing for a GIS programme is critical as it is not easily feasible to directly expand the local health-care staff positions to fill the GIS need. Areas where expertise is needed include GIS project management, GIS database skills, and application development. Training of the health-care workforce in general computing, database principles, and GIS are essential for increasing efficiency of use. Several dimensions of health and human services can benefit from the adoption of geo-informatics as a way of improving health and be in a better position to prevent and respond to public health emergencies. There is a need for health care systems to create new types of information that are both clinically relevant as well as place and time

sensitive in response to large scale emergencies. When appropriately implemented, GIS could potentially act as a powerful evidence-based practice tool for early problem detection and solving while modifying clinically and cost-effective actions in predicting outcomes, and continually monitor and analyze changes in health-care practices.

Published on: 2nd January, 2012

Medical Informatics: An Inventive Approach For Optimal Healthcare

"The future belongs to the unreasonable ones, the ones who look forward not backward, who are certain only of uncertainty, and who have the ability and the confidence to think completely differently". **– Bernard Shaw**

The limits of medical sciences have rarely been as thrilling and as full of opportunity as it is these days. From basic science through medical research to health services research, the opportunity made available through the inspirational advances of modern decades in the biomedical, physical, computational, and social sciences have brought us to a place of terrific revelation. The past three decades have witnessed an incredible development in the power and capabilities of computing technology, with a synchronized renovation in many aspects of our society, including medicine and healthcare. Contemporary medical centers have become dependent on computers and network communications, and experts in biomedical computing are now decidedly valued as key contributors to the environments in which care is delivered and health data is managed.

MEDICAL INFORMATICS IS A KEY ELEMENT OF THE PRACTICE OF EVIDENCED-BASED MEDICAL EDUCATION. STUDENTS WITH A WEB BASED MEDICAL EDUCATION CAN STUDY MORE EFFICIENTLY AND MAKE SOUND JUDGMENTS.

There has been an eruption in knowledge and information management activity, particularly in healthcare segment over the past few years. The world has progressed a lot in the field of healthcare by

making widespread use of information-based system. This has not only made the entire healthcare system learning and curing but also has benefited terrifically the doctors and patients to mutually enhance the performance of healthcare. Healthcare delivery is a high-touch responsibility that involves interaction between all stakeholders within the healthcare environment. Interpersonal communication is a key element of this interaction and can be transformed by the intelligent use of technology. Development of efficient public health information systems requires understanding of medical informatics, the systematic application of information and computer science technology to health practice, research and learning. Medical informatics is the swiftly growing scientific field that bond with resources, devices, and formalized methods for optimizing the storage, retrieval and management of biomedical information for problem solving and decision making. The appearance of medical informatics as a discipline is due in large part to progress in computing and communication technology, to an growing awareness that biomedical facts and clinical information about patients are efficiently unmanageable by traditional paper-based methods, and to growing conviction that the processes of knowledge retrieval and expert decision making are as important to modern biomedicine as the fact base on which clinical decisions or research plans are made.

Medical informatics has become significant at this time because of improvements in information technology, new challenges to the public health system, and changes in the healthcare delivery system. In the case of medical informatics, there are four principles, flowing directly from the scope and nature of health, that distinguish it from other subjects. These four standards describe, direct, and offer the circumstance for the types of activities and challenges that comprise this new field:

1. The primary focus of medical informatics should be on applications of information science and technology that promote the health of populations. As a discipline, medical informatics focuses on the health of the population and the community.
2. Medical informatics should focus on the information and technology that prevent disease and injury by changing the situation or the environment that put populations or individuals at risk.
3. Medical informatics applications should explore the potential for prevention at all vulnerable points in the causal chains leading to disease, injury, or disability; applications should not be restricted to particular social, behavioral, or environmental contexts.
4. As a discipline, medical informatics should reflect the governmental context in which public health is practiced. Much of public health manage through government agencies that entail direct responsiveness to legislative, regulatory, and policy directives, careful balancing of competing priorities, and open disclosure of all activities.

Furthermore, medical informatics is a key element of the practice of evidenced-based medical education. Students with a web based medical education can study more efficiently and make sound judgments regarding the clinical problems they encounter during their practical life. The curriculum adopted in the mainstream medical institutes of developed countries is replaced by a number of new teaching methods that improve dynamic learning but regrettably we are still stuck to the old traditional methods of teaching based on lectures and memorization. Presently large numbers of private and public medical institutes in Pakistan are still teaching by traditional methods whereas most of the medical institutes in the developed world are training their future physicians by latest teaching tools like evidenced-based and problem-based learning. We must recommit

ourselves to our teaching missions by energetically pursuing strategies that support and recognize the invaluable contributions of teaching faculty to the preservation of these missions. We must continuously innovate and utilize innovative methods like medical informatics as a tool to help us to attain our mission to produce physicians of 21st century. We should produce the healthcare providers who have the knowledge, attitude, aptitude and clinical skills.

Published on: 10th April, 2013

m-Health And The Future Of Healthcare

Health is considered as a universal human aspiration and a basic human right. The growth of society can be precise by the eminence of its population's health, how reasonably health is disseminated across the social spectrum, and the degree of protection. According to the World Health Organization (WHO), among 57 countries, generally in the developing countries, there is a serious shortage in healthcare workers, representing a total deficit of 2.4 million healthcare workers worldwide. WHO Health specialists note that within the next 10 to 15 years, policymakers and health providers in developing countries will be enforced to turn their focus to prevention and early detection rather than late-stage treatment of non-communicable diseases. This gap produces a foreseeable interventional role for mobile technology for health. Mobile for health – m-Health broadly encompasses the use of mobile telecommunication and multimedia technologies in healthcare delivery systems. A definition used at the 2010 m-Health Summit of the Foundation for the National Institutes of Health (FNIH) was "*the delivery of healthcare services via mobile communication devices*".

ACCESS TO MEDICAL CARE IN COUNTRYSIDE REGIONS IS A CHALLENGE IN EVERY COUNTRY AROUND THE WORLD.

MHEALTH APPLICATIONS CAN BE DESIGNED AS AN INTEGRAL PART OF THE OVERALL HEALTH SYSTEM, AND POLICYMAKERS ARE IN A UNIQUE POSITION TO SHAPE THESE EFFORTS.

Mobile phones have achieved momentous saturation in developing countries over the past decade. ITU estimated that there were 5.3

billion mobile subscriptions worldwide, including 3.8 billion in developing countries at the end of 2010. In the coming years, m-Health will revolutionize the way healthcare is delivered. From text message campaigns disseminating information on healthy lifestyles to the use of smart phones as medical devices capable of diagnostics and remote monitoring, mobile technology will permeate every aspect of health systems. There has been a bang of m-Health activities around the world. A 2011 global survey of 114 nations undertaken by the World Health Organization (WHO) found that m-Health initiatives have been established in many countries, but there is variation in adoption levels. Mobile technology is helping with chronic disease management, empowering the elderly and expectant mothers, reminding people to take medication at the proper time, extending service to underserved areas, and improving health outcomes and medical system efficiency. The most common activity is the creation of health call centers, which respond to patient inquiries followed by using SMS for appointment reminders, using telemedicine, accessing patient records, measuring treatment compliance, raising health awareness, monitoring patients, and physician decision support.

Mobile communication recommends an effectual means of bringing healthcare services to developing nations. With low-cost handsets and the penetration of mobile phone networks globally, tens of millions of citizens that never had normal access to a fixed-line telephone or computer now use mobile devices as every day tool for communication and data transfer. A full 64% of all mobile phone users can now be found in the developing world. Moreover, estimates show that by 2015, more than half of all individuals in isolated areas of the world will have mobile phones. This growing ubiquity of mobile phones is a central element in the promise of mobile technologies for health which Pakistan should also take full advantage of. The field has emerged in recent years as largely an

application for developing countries, stemming from the rapid rise of mobile phone penetration in low-income nations. The field, then, largely emerges as a means of providing greater access to large segments of a population in developing countries, as well as improving the capacity of health system in such countries to provide quality healthcare.

Access to medical care in countryside regions is a challenge in every country around the world. Nearly every nation has disparities between urban and rural areas. Health care providers and specialists are more likely to be located in densely-populated jurisdictions because that is where hospitals and advanced equipment are found. The applications of mHealth make doctors more resourceful because they don't have to be in the physical presence of a patient to judge his or her condition. mHealth technology allows people to overcome the limitations of geography in healthcare and access information at a distance. In Pakistan, mHealth applications can be designed as an integral part of the overall health system, and policymakers are in a unique position to shape these efforts. One of the most important roles to play in this regard is in driving innovation through incentives. Incentives can include tax rebates to telecom providers for provision of mHealth services, and funding for universities and researchers studying mHealth solutions. Only by thinking big, and acting immediately, mHealth can make a meaningful contribution to achieving health related MDGs by the 2015 deadline.

Published on: 2nd March, 2013

Potential Of m-Health To Improve Health Status

Mobile technologies are increasingly growing in developing countries like Pakistan. There have been several new researches and developments in this field around the globe. Currently, mobile phone is becoming a momentous Information and Communication Technology (ICT) tool not only in urban regions but also in remote and rural areas. The rapid expansion in the technologies, simplicity to use and the falling costs of devices; make the mobile an appropriate and adaptable tool to bridge the digital divide.

In Pakistan mobile phone ownership is growing rapidly; 87 percent of Pakistani households own mobile phones and cellular subscription in Pakistan reached 136.5 million at the end of March 2014. Evidence from selected studies carried out by the United Nations Conference on Trade and Development (UNCTAD) shows that mobile phones have become the most important mode of telecommunication in developing countries. The rapid expansion of mobile technologies within health service delivery and public health service delivery and public health systems has created a range of new opportunities to deliver new forms of interactive health services to patients, clinicians, and caregivers alike.

There has been explosion of mobile health (m-health) activities around the world and the expansion of mobile and wireless technologies has set up an incomparable opportunity for health. The International Telecommunication Union (ITU) approximated that there are now over 6 billion wireless subscribers, with more than 70 per cent of them residing low and middle income countries. Mobile phone networks cover at least 90 per cent of the world's population, including over 80 per cent of those living in rural areas. A 2011 worldwide study of 114 nations undertaken by the World Health

Organization (WHO) found that m-health initiatives have been established in many countries, but there is variation in adoption levels. The ability of developing countries to overcome health challenges is hindered by several core barriers, among them a global shortage of healthcare workers. Among 57 countries, mostly in the developing world, there is a critical shortfall in healthcare workers, representing a total deficit of 2.4 million healthcare workers worldwide, according to the WHO.

In recent years, m-health has emerged as an important sub-segment of the field of electronic health (e-health). While there is no widely agreed to definition for these fields, the public health community has coalesced around these definitions:

- e-Health: Using information and communication technology (ICT) – such as computers, mobile phones, and satellite communication for health services and information.
- e-Health: Using mobile communication – such as PDAs and mobile devices for health services and information.

Mobile communication offers an effective means of bringing healthcare services to developing countries citizens. With low cost handsets and the penetration of mobile phone networks globally, tens of millions of citizens that never had regular access of fixed-line telephone or computer now use mobile devices as daily tool for communication and data transfer. A growing number of developing countries are using mobile technology to address health needs. The m-health field is remarkably dynamic, and the range of applications being designed is constantly expanding. The key applications for m-health in developing countries are:

i. Education and awareness

ii. Remote data collection
iii. Remote monitoring
iv. Communication and training for healthcare workers
v. Disease and epidemic outbreak tracking
vi. Diagnostic and treatment support

The m-health has been incorporated into the field of health in an attempt to address the wide variety of challenges facing developing country systems, such as skilled worker shortage; lack of timely reporting for surveillance and diagnostics; poor treatment adherence; poor inventory and supply chain management. According to WHO governments in low and middle income countries are expressing interest in mHealth as a complementary strategy for strengthening health system and achieving the health related MDGs. The m-health is not only well-positioned to address these challenges using currently available technology but also emerging technologies such as wide-area wireless systems, will also be an asset in tackling todays health challenges and those of tomorrow. In Pakistan, m-health applications can be designed as an integral part of the overall health system, and policymakers are in a unique position to shape these efforts.

One of the most important roles to play in this regard is in driving innovation through incentives. Incentives can include tax rebates to telecom providers for provision of m-health services, and funding for universities and researchers studying mHealth solutions. Only by thinking big, and acting immediately, m-health can make a meaningful contribution to achieving health related MDGs by the 2015 deadline.

Published on: 12th July, 2014

Mobile Technology For Health: A Look To Developing Nations

Technology transform is not an independent aspect that impacts on society from external, but technology and society are mutually constitutive. Like the television in the 1950s and the internet in the 1990s, mobile phones have emerged as one of the essential communication technologies of our time. It has been said that the diffusion of mobile phones have been the fastest for any information and communication technology in human history. Mobile phones are becoming prolific in society, both in developed and developing countries. A growing number of countries are using mobile technology to address health needs. The m-health field is remarkably dynamic, and the variety of applications being designed is frequently increasing. Mobile phones being cost effective, easy to carry, personal in nature, less power dependent, easy to expand and upgrade, and simple to operate with huge exposure prove to be the single most valuable healthcare delivery device. Uses of mobiles in healthcare include:

- ✓ Education and Awareness
- ✓ Remote Data Collection
- ✓ Remote Monitoring
- ✓ Communication and Training of Healthcare Workers
- ✓ Disease and Epidemic Outbreak Tracking
- ✓ Diagnostic and Treatment Support
- ✓ Behavior Change/ Remodeling

Mobile technology has prolonged fabulously around the world. According to the Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2011-2016, *"the global mobile data traffic will increase 18-fold between 2011 and 2016 and by the end of that time period, it is projected that there will be 10 billion mobile devices in use around the world"*. In conjunction with 3G and 4G, these advances have marked a huge impact on many walks of life. Now this technology is floating to

alter how healthcare is delivered, the quality of the patient experience, and the cost of healthcare. M-health – the utilization of mobile applications for health – is a young and energetic field that could improve the well-being of people around the world. As a junction of health, technology, and finance, m-health is also a complex engineering where it can be difficult to develop sustainable business models. In a nutshell, mobile health evidently has expanded in number and type of initiatives and it is expected to become a multi-billion dollar field by 2017.

M-health – mobile health information technology characteristically refers to handy devices with the ability to create, store, repossess and transmit data in real time to improve patient wellbeing and the quality of care. The flow of mobile health information is characterized by portable hardware together with software applications and patient data that travels across wireless networks. Data transmission is comprehended by technologies that are common in everyday life, including cell phone, Bluetooth, infra-red, WiFi, and wired technologies, all of which function as part of a network. M-health development and utilization is diverse and profound, in clinical practice a clinician can use a mobile device to access a patient's electronic health record (EHR), write and transmit prescriptions to a pharmacy, interact with patient treatment plans, and communicate public health data, order diagnostic tests, review labs, or access medical references. M-health applications can also support to ensure social accountability. By using these applications, governments can establish feedback loops that individuals can use to provide feedback on government services, doctors, and care workers. In addition, m-health can help patients obtain the right information quickly and better understand their diagnoses and treatments.

Developing countries endure from pervasive health troubles that are less frequent or nonexistent in developed countries. In recent years the bulk of global attention to health has focused on communicable diseases, particularly the effort to meet the Millennium Development Goal (MDG) of controlling HIV/AIDS, malaria, and tuberculosis by 2015. Subsequently, developing countries have heavy burdens of health problems due to idiosyncratic events. When natural disasters occur, these countries are often not operational to compact with the resulting health emergencies. In this regards, mobile applications can play a pivotal role in identifying areas of greatest need, targeting services, and maintaining public awareness in emergency situations and after crises. In Pakistan, national healthcare system is still struggling to deliver affordable access to healthcare to all citizens. Despite the potential it holds, m-health deployment is presently narrow in the country. Imperative actions are therefore needed to break down barriers to the widespread adoption of mobile technology in healthcare and, most urgently are the need to increase knowledge and awareness of the potential impact of m-health among healthcare organizations, patients, and other stakeholders in country. M-health has the potential to revolutionize the delivery of healthcare in Pakistan.

"With medical knowledge expanding every day, no physician can keep up without help. By using high-tech medical communication, high-performance computers, high resolution video, and fiber-optic information "Superhighways", we have been able to put the entire world of medical science at the fingertips of even the most isolated rural family doctor"

– C. Everett Koop

Published on: 31st December, 2012

Health ICT Towards The Millennium Development Goals

Current telecommunication technologies have an astonishing ability for transmitting information. The internet provides abundant database, reference materials, and online journals that all have given enormous significance to connectivity in developing regions of the world. These resources have brought enormous benefits to tertiary healthcare institutions not only in Pakistan but also other developing countries. The implementation of health ICTs in developing countries and in Pakistan particularly has been hampered by traditional obstacles: poor infrastructure, lack of resources, and insufficient political commitment and support. This can be appropriately summarized as follows, as the "Four Cs": connectivity, cost, capacity, and culture.

Presently, the problem of improving health-care delivery in developing countries is more about the impartial distribution of available resources to all areas of the health system than about technology. Technologies exist that would help doctors working in isolated rural villages to access up-to-date medical information and communicate with colleagues, and even to diagnose illnesses and treat patients. Yet, these health workers who care 60 to 65% of the population of

THERE IS GROWING RECOGNITION OF THE NEED FOR A PARADIGM SHIFT TO ADDRESS THE DIVERSE NEEDS OF HEALTH-CARE PROVIDERS.
THERE HAS ALSO BEEN INCREASED GLOBAL ATTENTION ON THE NEED TO STRENGTHEN HEALTH SYSTEMS IN GENERAL AND HUMAN RESOURCES IN PARTICULAR.

Pakistan that still live in rural areas have no meaningful access of internet. The rapid growth and extensive use of wireless technologies provides the best opportunity to reach these isolated health workers. There has also been increased global attention on the need to strengthen health systems in general and human resources in particular. There is growing recognition of the need for a paradigm shift to address the diverse needs of health-care providers, as follows: skills, equipment, information, structure support, medicines, incentives, and communication facilities.

Telemedicine covers various communication modalities and is not a single technology. This ranges from the use of sophisticated video conferencing and other conferencing modalities, through Web-based provider patient communication systems, to the use of basic telephone service. It is defined as the delivery of health care and the sharing of medical knowledge over a distance using telecommunications. In the developing countries, the promise of remote diagnosis and treatment heralded new hope for health sector, particularly in Pakistan where communities live in rural areas and health care is sparse. However, the persistence of poor infrastructure, poor investment, and lack of political support hampered its growth. There are, however, a few pilot projects and case studies have been reported from various parts of Pakistan. This is the beginning of a learning curve for the health sector in Pakistan ultimately; success will not come from using expensive, high-end, cutting-edge technology, but from tools that are simple, appropriate, and adapted to local needs.

Ten years ago, Simon Forge of the World Bank argued that telecommunications will soon become routine rather than a luxury services. He further predicted that by year 2005 telecommunications will have become so cheap that all charges, installation, and use will be perceived as free by all users, and considered a basic right even in

the poorest countries. This predication is yet to be achieved globally and more visibly in the health sector in developing countries. Progress, however, has been made in tertiary care institutions with regard to electronic communications, access to health-care information, and stronger engagement of researchers with the international scientific community. The increasing use of wireless technologies has begun to surmount the persistent obstacles to the implementation of ICTs, but their capacity to carry information remains to be enhanced. To scale up these benefits will require a better understanding of local conditions, better training of health workers, and appropriate choice of ICT tools.

Published on: 9th April, 2012

Telehealth Solution For Developing Countries

The combination of medical knowledge with information knowledge is one of the most fascinating scientific and disciplinary breakthroughs of our time and may well lead to cultural changes and new individual and collective attitudes, competences, communication and cooperation in fighting or preventing disease, in protecting or enhancing health and in promoting wellness. As far as health information, health-care, and health communication is concerned, the internet already provides a wealth of information and advices, establishes new cyberspace communities concerned with health and health care, and allow for distributing previously privileged medical knowledge 24 hours, 7 days a week, accessible around the globe.

In 1994, a multi-disciplinary group of young professional from 24 different countries gathered and wrote a visionary report entitled, *"Global Access Telehealth and Education System" (GATES)*. This report detailed how to utilize information and communication technology (ICT) to provide health and education services to the entire world, in particular developing countries. Developing countries face various problems in the provision of medical service and health-care. Many developing countries have inadequate health-care and medical services and they also suffer from shortage of doctors and health-care professionals. Telehealth is a relatively newer concept as far as most

REDUCTIONS IN MEDICAL ERROR, THE REALIZATION OF COSTS SAVINGS, REAL-TIME MONITORING OF PUBLIC HEALTH INCIDENTS AND THE PROVISION OF VALIDATED DATA AND INFORMATION FOR HEALTH SYSTEM DECISION AND POLICY MAKING ARE JUST SOME OF THESE BENEFITS.

of the developing countries are concerned. It is fast gaining popularity and is being reckoned as one of the befitting means to rendering health-care services cost effectively and to a wider geographic spread. It is imperative to take advantage of the present day technologies, especially the information communication technologies (ICTs), which have enormous potential to providing health-care. Telehealth represents a new approach to health-care, with the potential for improving accessibility and reducing cost. Telehealth can be defined as "*the use of information and communication technology to deliver health services and exchange health information when distance separates the participants*". There are many potential benefits of telehealth that can be divided into benefits for the patient, remote health-care provider, central health-care provider.

1. **Benefits for Patients**

- Improve access to medical specialists
- Quicker, more accurate diagnosis and treatment
- Reduce travel
- Decrease stress
- Decrease cost (travel, meals, accommodation)

2. **Benefits for Remote Health-care Provider**

- Improve access to medical specialists
- Increase confidence in management
- Increase opportunities for education
- Decrease professional isolation
- Virtual meetings
- Collaborative research

3. **Benefits for Central Health-care Provider**

- Decrease need to travel

- Improve screening of patients
- Improve follow-up
- Increase educational opportunities
- Virtual meetings
- Collaborative research

Telehealth solution can have real, short-term improvement at many levels, including a direct advantage to patients. Reductions in medical error, the realization of costs savings, real-time monitoring of public health incidents and the provision of validated data and information for health system decision and policy making are just some of these benefits. However, there is an ongoing need to support research that demonstrates these benefits within the framework of cost-benefit analysis in order to justify the often significant up-front costs associated with the implementation of comprehensive, system-wide telehealth solutions. This, of course, is particularly significant in the context of developing countries with limited financial resources and telecommunications infrastructure. Technologists believe that what is now required is the development of a rigorous research methodology that is relevant and applicable to the context of developing nations. Such a methodology must be based on an applied research modality in which the fundamentals of the work address real and significant issues of human health as they influence the development process. The needs of people living in developing countries are profound. Their pursuit of equity and full participation in global society faces enormous hurdles but, ultimately, is firmly dependent on a healthy society will full access to effective health-care. The technologists are committed to finding a way that ICT can achieve this.

Published on: 9th May, 2012

Electronic Health Records (EHRs) For Improved Healthcare!

"Change is hard because people overestimate the value of what they have, and underestimate the value of what they may gain by giving that up" **– James Belasco and Ralph Stayer**

Information and communication technologies (ICTs) have been recognized in the past decades as an important tool for the scientific, economic, and social growth of a country. In the health sector these technologies have proven to be a momentous aspect for an effectual and comprehensive planning, management, and evaluation of healthcare. The enlarged expansion and use of these technologies in health delivery systems in the developed countries led to an improvement of the quality of services, security as well as to cost reduction for patients. In the present days, healthcare is characterized by a continuous decision-making process, that requires timely and secure access to complete, accurate, and up-to-date patient information, as well as to the accumulated wide-ranging body of medical knowledge. The most essential aspect of this need is the modern national initiative to develop and implement Electronic Health Records (EHRs). Traditionally, patient information has been maintained as paper-based records but now electronic health records are increasingly deployed in countries across the globe. The electronic health records include all information

ADOPTION OF ELECTRONIC HEALTH RECORD SYSTEMS ARE CRITICAL AND NECESSARY COMPONENTS FOR ADVANCE HEALTHCARE, AND EHR SYSTEMS ARE THE FUNDAMENTAL BUILDING BLOCKS FOR ANY NATIONAL HEALTH INFORMATION SYSTEM.

contained in a traditional health record including a patient's health profile, behavioral and environmental information as well as the dimension of time, which allows for the inclusion of information across multiple episodes and providers, which ultimately evolve into a lifetime record. At the same time, EHR enable critical, real time information services that empower both patients and healthcare workers. The global market for electronic health records is expected to grow an astounding 27.8 percent by 2015, including EHR projects in both the developed and developing world. Electronic health record offers the challenge to change from paper medical record to computerized/electronic records. In this way it is easy to share patient health records among relevant physicians/organizations.

In past years we have witness rapid technological development in services such as internet and cellular technologies, which have led to the emergence of new ways of managing information. Specifically in healthcare, the need for portability and instant communication has transformed the use of Electronic Health Records (EHRs). The reach of these technologies in developing world, via both internet access and mobile phones, is increasing exponentially. When information and communication technology is used for health applications, it is termed as e-health while its application limited to mobile phones technology is called m-health. Developed countries have longer recognized the need of education programmes in health information technology. In order to respond to the shortage of high qualified and well trained health planners and decision-makers in their countries, several developed countries have established various national curriculums. Specific benefits of electronic health record systems include:

1) Facilitates speed and accessibility in obtaining consultations from distant specialists.

2) Provides reminders to routine screenings, prescriptions, administration of vaccines and other health maintenance benefits.
3) Supports the handling of data for clinical research.
4) Make clinical notes and documentation legible, reducing clinical errors associated with illegible handwriting.
5) Generates warnings for abnormal laboratory results.
6) Management of chronic diseases such as hypertension, diabetes etc.
7) Supports program monitoring, including reporting outcomes, budgets and supplies.
8) Provides ease to information transfer and sharing.

A good health information system brings collectively all appropriate associates to guarantee that users of health information have access to reliable, authoritative, usable, understandable and comparative data. Pakistan's health sector is striving to improve health outcome, not only in terms of upgrading in the macro-level indicators, but also in terms of perfection in access and deployment of healthcare services. The improvement in quality will come about through better management of health information. Electronic health records and data sharing not only will improve quality of health, reduce costs, and decrease medical errors but also will give immediacy and accessibility to healthcare providers, which is a significant benefit for the patients. Adoption of electronic health record systems are critical and necessary components for advance healthcare, and EHR systems are the fundamental building blocks for any national health information system. Widely deployed EHR systems can provide population-level health information that can be used by epidemiologists and other research. Thus, healthy systems of EHR build practical use of clinical data to improve healthcare.

Published on: 22nd May, 2013

Telemedicine: Now A Part Of Medical Team

The convergence of information and communication technologies (ICT) for improving health system through telemedicine addresses both changes in the access of healthcare information and services as well as wider dissemination of healthcare related skills and specialist expertise into community, into home and ultimately the individuals. The use of the internet and high-tech communications in health care has led to new approaches to medical treatment and to challenging legal questions. The health care providers, hospitals, pharmaceutical companies, insurers and their legal counsels are exchanging medical information through web-portal access using telemedicine. The application of telemedicine in health system improvement can be classified as the use of e-health in the provision of health services at a distance (tele-health), management of clinical and administrative information (health informatics), and sharing information with health care providers, patients, and communities (e-learning). Proven benefits of telemedicine include improved access to care, enhanced quality of services, and reduced costs of care for patients and health care systems. However, use of telemedicine within or between institutions involves a number of factors that require appropriate planning. Many of these issues cannot be addressed without the support of well-defined policies, rules, standards, or guidelines at the institutional, jurisdictional, and global levels. It is important for the planners of telemedicine at different levels to develop policies that could facilitate the adoption of telemedicine and prove its success through improvement in services and change in public health status.

Doctors have recently gained extensive knowledge of using telemedicine applications for consultations, education and training, and conferences. What is still lacking is systematic evaluation of these new approaches compared with traditional measures. Trials involving

consultations for diagnostic, monitoring, and interpretative purposes should be blinded and multicentred, and should include tests of patients satisfaction as well as macro-economic considerations. The quality of educational programmes and conferences should be documented and compared with traditional teaching methods. International standards need to be developed for such evaluations, to allow valuation between trials performed at national and international levels. Pakistan is in a good position to contribute to these developments because of a well-integrated health care system and excellent telecommunication facilities. Through telemedicine, Pakistan possibly will resume a leading global position in the use of advanced information technology. There are still significant gaps in the evidence base between where telemedicine is used and where its use is supported by high-quality evidence. Further well-designed and targeted research that provides high-quality data will provide a strong contribution to understanding how best to deploy technological resources in healthcare. The identification of a number of critical requirements for the successful implementation of ICT projects and programs in the health sector of developing countries includes:

i. purpose, strategies, and scope of services to be provided;
ii. audiences, customers, and users (targeted populations);
iii. value of health and healthcare to the individual and community;
iv. current ways to assess individual and collective health problems (community health);
v. needs of the individual, community, and nation;
vi. institutional user needs and commitments; and
vii. competencies of the organization implementing or hosting the ICT system.

ICT have clearly made an impact on health care, includes:

- improved dissemination of public health information and facilitated public discourse and dialogue around major public health threats;
- enable remote consultation, diagnosis and treatment through telemedicine;
- facilitate collaboration and cooperation, among health workers, including sharing of learning and training approaches;
- support more effective health research and the dissemination and access to research findings;
- strengthened the ability to monitor the incidence of public health threats and respond in a more timely and effective manner; and
- improve the efficiency of administrative systems in health care facilities.

Telemedicine now has the potential to make a difference in the lives of sick people. Depending upon the level of technology employed, telemedicine can reduce professional isolation of the rural primary practitioner in several ways. For instance, two-way interactive video consultation with specialists links the isolated practitioner with the specialist community of a large medical care. This virtual support system and contact with professional colleagues should enhance the integration of the rural or otherwise isolated practitioner. However, it must be noted that these contacts are only temporary, will occur only sporadically, and depend on the level of telemedicine technology employed. Therefore, the extent of the integrative possibility of telemedicine remains to be determined. The technology also has the potential to link the primary practitioner with on-line services which provides the opportunity to review the latest medical literature, thereby strengthening links to the professional medical community and improving the quality of care for the rural patient.

Health For All: e-Health In Pakistan Prospective

Health is one of the fundamental needs for normal existence. In Pakistan, the existing health system is not capable enough to provide adequate services for the growing population. Such a sorry state of affairs can be attributed to some key issues associated with health sector from very beginning. Deficiency of funds, limited access to health services and their insufficiency, extreme poverty, ignorance and lack of awareness among the masses and poor health infrastructure have been identified as fundamental problems in the way of improving public health. These problems still stand and militate against the efforts of the government to make the health sector efficient. Previous National Health Policies were formulated in 1990 and 1997 to form the basis for the development of the country. These policies aimed to address the basic problems in the health sector by strengthening the health care system on the basis of Primary Health Care (PHC) and bringing about the needed reforms in all areas of health. However, due to reasons of improper implementation and gaps in action on the decided agenda by the successive governments, these policies did not meet their objectives. The problems faced by the health sector were: poor management of health services; poor quality of services; low utilization of health care facilities at PHC level; absenteeism and unprofessional attitude of staff; shortage of resources, supplies, medicines etc; lack of basic facilities like transport,

THE FUTURE DEVELOPMENT OF ANY TECHNOLOGY OBVIOUSLY DOES NOT OCCUR IN A VACUUM, MAKING ACCURATE FORECASTS AND PREDICTIONS EVEN MORE DIFFICULT.

communication, safe water, sanitation, electricity, security etc; administrative delays; lack of incentives for staff to improve performance; lack of career structure for doctors, paramedics, nurses, and other health staff; lack of accountability of staff to communities; inefficient use of resources; unresponsiveness to community needs; over-centralization; corruption; lack of supportive supervision/monitoring and external interference. A large number of problems and inadequacies in the health sector relate to the lack of adequate finances. This partly explains the poor quality of health services, over-burdened outdoors, out of order equipment, insufficient medicines, and the relatively small number of beds, doctors and paramedic staff for patients in the hospitals. At the same time, however, there is a whole set of problems, which relates to the utilization of resources that are made available. It is widely believed that whatever limited resources are allocated to the health sector is not efficiently and optimally utilized.

Using mobile/wireless information and communication technologies (ICTs) has transformed healthcare operations not only in developed countries, but also the developing ones. This application of ICT in healthcare has been termed e-Health. The importance of e-health is further confirm by the fact that in May 2005 the World Health Assembly of the World Health Organization (WHO) endorsed a resolution on e-health that invites all the member states to develop their own national e-health strategies and accordingly established the Global Observatory for e-health. The International Telecommunication Union (ITU) established ITU-T Study Group 16 Work on e-health to handle the standardization of multimedia systems to support e-health applications. According to WHO, the use of ICT in health is not merely about technology, but a means to reach a series of desired outcomes, such as;

- health workers making better treatment decisions;
- hospitals providing higher quality and safer care;
- people making informed choices about their own health;
- governments becoming more responsive to health needs;
- national and local information systems supporting the development of effective, efficient, and equitable health systems;
- policymakers and the public becoming more aware of health risks; and
- people having better access to the information and knowledge they need for better health.

The health care system in Pakistan comprises the public as well as private health facilities. In the public sector, districts have been given power of developing their own strategies, programs and interventions based on their local needs. The human resource available for health care registered till December 2009 in the country included 139,555 doctors, 9,822 dentists and 69,313 nurses. The current population-doctor ratio is 1,183 person per doctor and 16,914 per dentist. Health care is also provided to the public through vast health infrastructure facilities now consisting of 968 hospitals, 4,813 dispensaries, 5,345 Basic Health Units, 572 Rural Health Centers and 293 TB Centers etc. However, the health care system as a whole needs to be strengthened further at all levels. The future development of any technology obviously does not occur in a vacuum, making accurate forecasts and predictions even more difficult. The social and cultural milieu may alter, limit, or even prevent development of new ideas and technology development as well as the acceptance and/or implementation of both. E-health has potential to benefit the Pakistani people health-care system in term of preventive care and disease treatment.

Published on: 3rd March, 2012

Pakistan Desperately Needs IT-Based Health Management System

The health system in developing countries has changed radically during the last few years from a centralized system to a decentralized mechanism significantly bringing positive changes in the overall health system. However, Pakistan is still taking shallow initiatives in this field with having no mature approach to tackle the decades old core issues in the relevant field. The implementation of health management information system (HMIS), which emphasizes the use of information at the point of collection, is a pre-requisite to ensuring more accuracy and speedy dissemination of patients and diseases data at all levels. Experts on modern health system are of view that through decentralization more freedom and responsibilities are given to each point of care meaning that more skills are demanded of primary health care managers.

PRESENTLY, THE REGIONS, NATIONS, AND COMMUNITIES THAT COMPRISE THE DEVELOPING WORLD FACE A WIDE VARIETY OF HEALTH-RELATED CHALLENGES, AND HEALTH SYSTEMS THAT ADDRESS THOSE CHALLENGES ARE STRUGGLING WITH LIMITED RESOURCES AND CAPABILITY.

Unfortunately, the health management and information system in Pakistan is woefully inadequate in providing the needed management support. Most healthcare providers in the country equate information system with filling endless registers with name and address of patients, compiling information on diseases every week or every month and sending out reports without ever receiving any feedback. In fact, the HMIS for health systems serving the poorest parts of the world are

still in their infancy. The challenges are significant, but the need to improve health outcomes is simply too great to ignore the value of better information to health system performance. Health leaders must, therefore, focus on maximizing the value of scarce resources and finding ways to make health systems operate as efficiently as possible.

The facility based health information system is one of the most powerful tools for the planning and management of health services. In view of the existing vast health infrastructure, spread all over the country in terms of health facilities, services, staff, drugs and supplies etc. there has been a need to establish an efficient information system responding to the information needs of various decision making levels of the healthcare delivery system. The importance of a health management and information system cannot be ignored as health policies and planning in any country depends mostly on the correct and timely information on various health issues.

Presently, the regions, nations, and communities that comprise the developing world face a wide variety of health-related challenges, and health systems that address those challenges are struggling with limited resources and capability. Having reliable data on the performance of different parts of the health system is the only way to devise, execute, and measure health interventions. The health experts suggest that successful strengthening of health system will require relevant, timely, and accurate information on the performance of the health system itself and the goal of a health information system (HIS) is to provide such information.

In the conventional way of information collection, the data is not helpful for decision making as it is unreliable, incomplete, untimely and rarely pertains to the procedures required to perform. Currently the HMIS is widely seen as management obstacles rather than as

tools. The current situation of health information system in Pakistan demands of the decision makers to take effective initiatives and introduce changes for further collaboration among various vertical health programme information systems and integrate them into one system. The integrated approach will not only save resources but also develop efficiency of the information systems as a whole, the experts said adding it is also required to encourage utilization of information at the facility level by improving efficiency of the system so that the health providers receive up-to-date information.

Published on: 10th January, 2014

Corruption In Health System: The Scale Of Problem!

Health is a most significant global industry but, more than that, it is a global human right. The health sector is susceptible to abuse through diverse channels. Health system integrates various different actors in a complex web of relationships, which makes corruption difficult to identify where it exists. Corruption in the health system is broadly known both in developed and developing countries but widespread corruption in Pakistan is disquieting. According to the Transparency International, corruption may be defined as *"the misuse of entrusted power for private gain" or "sale by government officials of government property for private gain"*.

Corruption in the health division is not exclusive to any particular kind of health system. It occurs in systems whether they are principally public or private, technically simple or sophisticated, and sound funded or badly funded. The degree of corruption is, in part, an indication of the society in which it operates. Health system corruption is less expected in societies where there is broad obedience to the rule of law, transparency and trust, and where public sector is ruled by effective civil service codes and strong accountability mechanism.

ACCORDING TO THE STUDY CARRIED OUT BY THE INTERNATIONAL MONETARY FUND (IMF) USING DATA FROM 71 COUNTRIES, SHOWS THAT COUNTRIES WITH HIGH INDICES OF CORRUPTION SCIENTIFICALLY HAVE HIGHER RATES OF INFANT MORTALITY.

Corruption in the health system is an anxiety in all countries, but it is particularly serious problem in developing countries like Pakistan. The number of features of health system corruption can be identified that includes: financial leakages, fraud, illegal fees, theft of supplies and equipments, over-invoicing, clever book keeping, selling public positions and bribes, failure to base decisions on evidence, etc. According to the cross country survey by Transparency International, the public gauging perceptions of corruption in public service shows that 95% of the study population perceives that the health system is corrupt in Pakistan.

The overall impact of corruption in health system on society and on individuals can be wide-ranging. We can differentiate between direct and indirect impacts, for example, tangible (material, health quality) and intangible (social, psychological), short term (price and quality) and long term (health system) impacts. Corruption not only reduces the resources effectively available for health, lowers the quality, equity, and effectiveness of healthcare services, but also decreases the volume and increases the cost of provided services. The list demonstrates the overall impact of corruption in healthcare on the society and on individuals.

- **Impact on health budget:** Corruption in health system may lead to a non-optimal allocation of health budgets;
- **Impact on price:** Corruption in health system may lead to a provision of services or procurement of equipment and drugs at above market prices;
- **Impact on access to health:** Corruption in health system may threaten the goal of universal health coverage because as the price of healthcare increases, the accessibility decreases;
- **Impact on health quality:** Corruption in health system may lead to low quality in the provision of healthcare services and

a low quality in the provision of medical devices and pharmaceuticals;

- **Impact on markets:** Corruption in health system may lead to various market distortions such as bad doctors driving out good doctors, bed suppliers driving out good suppliers;
- **Indirect impact on society:** Corruption in health system may cause productivity loss through bad health; distrust in provisions of services by the government; distrust in the health system; and distrust in society as a whole;
- Cross-border impacts: Corruption in health system may lead to brain drain of medical personnel;

According to the study carried out by the International Monetary Fund (IMF) using data from 71 countries, shows that countries with high indices of corruption scientifically have higher rates of infant mortality. Reverting back to local setting, initially, preventing maltreatment and reducing corruption is a key to increase capital available for health, to make more efficient use of existing resources and, ultimately, to improve the general health status of the population. Before I finish, for promoting anti-corruption plan in Pakistan the government should ensure the law against corruption and the law should be enforced equally for everyone. An effective and efficient anti-corruption policy will result in great decline of corruption not only in health system but also all public sectors.

Published on: 20th March, 2014

Health Informatics – A Turning Point In Health System!

No phase of human life has escaped from the impact of the "Information Age", and feasibly in no area of life is information more critical than in healthcare and medicine. Improving healthcare services in any society requires strengthening various elements of healthcare services and it is understandable that the healthcare is an information-based and information-driven activity. Information signifies major actions in the healthcare profession currently a number of forces are together focusing attention on this function. Health Informatics is the field that orients itself with the cognitive, information processing, and communication tasks of medical practice, education and research, including the information science and the technology to support these tasks. It is a primarily interdisciplinary field with infinitely functional focus, but it also addresses a number of fundamental research problems as well as planning and policy issues. Healthcare institutions all over the world are beginning to make large-scale assurance to information systems and to services that will influence every aspect of their organization's function. Health informatics is the scientific field that deals with biomedical/health information, data, and knowledge – their storage, retrieval, and

A NUMBER OF DEVELOPING COUNTRIES HAVE RECENTLY UNDERTAKEN STRUCTURAL REFORM TO THE HEALTHCARE INFORMATION AND DELIVERY SYSTEM; AN IMPORTANT COMPONENT OF THIS REFORM IS THE ESTABLISHMENT OF RELIABLE, TIMELY AND EFFECTIVE INFORMATION SYSTEMS.

optimal use for problem solving and decision making. Consequently it touches on all basic and applied fields in biomedical/health sciences and is strongly attached to modern information and communication technologies (ICT's), principally in the areas of computing and communication.

Information and communication technologies (ICTs) have been recognized in the past decades as an important tool for the scientific, economic, and social growth of a country. In the health sector these technologies have proven to be a meaningful aspect for an effectual and comprehensive planning, management, and evaluation of healthcare. The enlarged expansion and use of these technologies in health delivery systems in the developed countries led to an improvement of the quality of services, security as well as to cost reduction for patients and health system. In the present days, healthcare is characterized by a continuous decision-making process, that requires timely and secure access to complete, accurate, and up-to-date patient information, as well as to the accumulated wide-ranging body of medical knowledge. Health informatics has become noteworthy at this time because of improvements in information technology, new challenges to the healthcare system, and changes in the healthcare delivery system. In the case of health informatics, there are four principles, flowing directly from the scope and nature of health, that distinguish it from other subjects. These four standards describe, direct, and offer the circumstance for the types of activities and challenges that comprise this new field:

- The primary focus of health informatics should be on applications of information science and technology that promote the health of populations. As a discipline, health informatics focuses on the health of the population and the community.

- Health informatics should focus on the information and technology that prevent disease and injury by changing the situation or the environment that put populations or individuals at risk.
- Health informatics applications should explore the potential for prevention at all susceptible points in the causal chains leading to disease, injury, or disability; applications should not be restricted to particular social, behavioral, or environmental contexts.
- As a discipline, health informatics should reflect the governmental context in which public health is practiced. Much of public health manage through government agencies that entail direct responsiveness to legislative, regulatory, and policy directives, careful balancing of competing priorities, and open disclosure of all activities.

The need for education in health informatics is accredited by most countries that are involved in the introduction of technology in healthcare. A number of developing countries have recently undertaken structural reform to the healthcare information and delivery system; an important component of this reform is the establishment of reliable, timely and effective information systems. Additionally, health informatics is also a key element of the practice of evidenced-based medical education, students with a web based medical education can study more resourcefully and make sound judgments regarding the clinical problems they encounter during their practical life. The curriculum adopted in the conventional medical institutes of developed and developing countries is replaced by a number of new teaching methods that improve dynamic learning but unfortunately we are still stuck to the old traditional methods of teaching based on lectures and memorization. Presently large

numbers of private and public medical institutes in Pakistan are still teaching by traditional methods whereas most of the medical institutes in the developed world are training their future physicians by latest teaching tools like evidenced-based and problem-based learning. Since health information and information management is not generally documented in Pakistan and this area has not been given the due attention among the health profession thus, it is essential that health informatics be considered as a tool for better healthcare and health system management and be promoted through education and training and introduction of health informatics in the health and biomedical education is of prime importance. The following points to develop the health informatics for the federal and provincial government (Ministry of Health, Education and IT) are recommended.

1. Government should build master plans for introduction and implementation of health information technology in healthcare institutions. Plans should cover the framework defining needs of users, software development policies and standards, phases of implementation, resources requirement, governance and structure;
2. Awareness campaigns should be conducted to sensitize healthcare professionals on the importance of health informatics and their specific roles in its adaptation;
3. Financial and human resources ought to be allocated at the national and district levels to support execution of health informatics plans;
4. Should develop management information systems for both administration of the healthcare sector and for the management of the technical programmes;

5. Must develop a model of health informatics curriculum for medical colleges in the country and the course must be introduced during the early years of medical education;
6. And, should invest in human resources development in the "Information Technology" area.

"We must continuously innovate and utilize innovative methods like health informatics as a tool to help us to attain our mission to produce physicians and healthcare providers of 21st century. We should produce the health providers who have the knowledge, attitude, aptitude and clinical skills."

Published on: 11th October, 2013

Public Health Informatics In The Information Age

"THE NEW information and communication technologies (ICTs) are among the driving forces of globalization. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, the gap between information haves and have-nots is widening, and there is a real danger that the worlds poor will be excluded from the emerging knowledge-based global economy". **– Kofi Annan –** (former Secretary General United Nations).

No aspect of human life has escaped the impact of the "Information Age", and conceivably in no area of life is information more critical than in health and medicine. Improving healthcare services in Pakistan requires strengthening various elements of healthcare services and its obvious that the healthcare is an information-based and information-driven activity. Information management constitutes a major activity in the healthcare profession currently a number of forces are together focusing attention on this function.

Public Health Informatics (PHI) is the field that concerns itself with the cognitive, information processing, and communication tasks of medical practice, education and research, including the information science and the technology to support these tasks. It is a fundamentally interdisciplinary field, with a highly functional focus, but it also addresses a number of fundamental research problems as well as planning and policy issues. Healthcare institutions are beginning to

DEVELOPMENT OF EFFECTIVE PUBLIC HEALTH INFORMATION SYSTEMS REQUIRES UNDERSTANDING OF PUBLIC HEALTH INFORMATICS, THE SYSTEMATIC APPLICATION OF INFORMATION AND COMPUTER SCIENCE AND TECHNOLOGY TO PUBLIC HEALTH PRACTICE, RESEARCH AND LEARNING.

make large-scale assurance to information systems and to services that will affect every aspect of their organizations function. Public health informatics is the scientific field that deals with biomedical information, data, and knowledge – their storage, retrieval, and optimal use for problem solving and decision making. It accordingly touches on all basic and applied fields in biomedical science and is closely tied to modern information and communication technologies (ICTs), especially in the areas of computing and communication. Public health informatics encompasses the theoretical and practical aspects of information processing and communication, based on knowledge and experience derived from processes in medical and healthcare.

Public health informatics has grown to be critical at this time because of improvements in information technology, new challenges to the public health system, and changes in the medical care delivery system. Today's computer systems are faster and cheaper than ever before, and prices are continuing to decrease rapidly. In fact, computer hardware is no longer the major cost it once was in information system development projects. Meanwhile, the need for new and improved information systems for public health is growing because of new challenges related to antibiotic-resistance, emerging infection, and chemical and biological terrorism. As a result, there is growing interest in capturing information electronically from sources outside the official public health organizations, such as hospitals, laboratories, healthcare centers, and environmental agencies.

Development of effective public health information systems requires understanding of public health informatics, the systematic application of information and computer science and technology to public health practice, research and learning. Public health informatics is distinguished from other informatics specialties by its focus on prevention in populations, use of a wide range of interventions to achieve its goals, and the constraints of operating in a legislative context.

This priority area focuses on technologies that facilitate remote delivery of healthcare and assist living, moving the emphasis of care to the patient in their own home. Connected health and independent living technologies have the potential to transform healthcare and service delivery, thereby reducing burden on health systems and improving the quality of life and sovereignty of our ageing populations. This is an emerging area and there is an opportunity to position Pakistan as a proving ground for connected health solutions.

Published on: 24th March, 2012

Socio-tech

"Science Journalism" – Building Public Engagement In Science

"I saw on TV…", "I heard on radio…" and "I read in the newspaper…" are phrases that catch our attention. In the 21st century, the mass media has become the most influential medium that communicates to large numbers of individuals. News is the building block that helps us to construct an understanding of the world we live in, and science and technology (S&T) are principal dynamics in shaping tomorrow's world. Research and innovation have been acknowledge as key factors in meeting the numerous challenges of our time such as energy supply, food security, health and mobility, environmental changes etc. Being key challenges, public and policy makers must be provided the information that is obligatory to call science and technology to account. For the reason, there is an increasing need of independent science journalism and science communicators to interpret, explain and comment on the results of scientific research and technological development.

THE IDEA THAT, TO BE SUCCESSFUL, A TECHNOLOGY MUST MEET LOCAL NEEDS, CONDITIONS AND RESOURCES FOR SOCIAL DEVELOPMENT.

THE EMERGING FIELD OF SCIENCE JOURNALISM SOUGHT TO PRODUCE A SCIENCE-MINDED PUBLIC ABLE TO APPRECIATE, AND WILLING TO SUPPORT AND UNDERSTAND SCIENCE AND TECHNOLOGY AND SCIENTIFIC RESEARCH.

Globally, the public communication of S&T – Science Journalism, is expanding rapidly as a professional and academic field. In developed

counties science journalism is accelerating because of advances in information and communication technology (ICT) that facilitates scientific and methodological reporting and scientists are reaching the pubic and policy makers through blogs and social media tools. Momentarily, Pakistan has made a phenomenal progress in S&T and ICT in the past two decades, on the other hand, to what extent the science and scientific knowledge is transmitted to the common masses remains a tricky question in Pakistan?

Science journalism appears to be flourishing in developing counties and journalists are now operating a new science-media ecosystem where scientists and journalists are providing original discoveries directly to the general public instead of going through the official publishing process. Science services made the first sustained effort at gathering and dissemination consistently credible, engaging and understandable news of science and emerging technologies to a nationwide audience through the easily accessible mainstream media. The emerging field of science journalism sought to produce a science-minded public able to appreciate, and willing to support and understand science and technology and scientific research.

Because of the importance of S&T, it is important that science journalists show how science actually works. That goes beyond just editorials about remarkable expansions in science but includes information about the organizations and funding of scientific research too. Scientific writing or science journalism remains embryonic in Pakistan and there are many dimensions to the problems. Unfortunately the large segments of the population even do not have access to scientific knowledge due to illiteracy and in absence of critically planned science policy for dissemination of scientific knowledge to non-scientific community. Although, Pakistan's engagement in scientific activities is multiplying and diversifying but,

science journalism is very much limited and mainstream media coverage on issues related to S&T is alarmingly poor and limited. Conversely, low priority in science journalism in the mainstream media is also deeply rooted in the country's journalism history.

The idea that, to be successful, a technology must meet local needs, conditions and resources for social development. I would say there is definitely a future for science journalism in Pakistan. There is need for scientific reporting about developments in science and technology, including science policy and science funding. Last but not the least, a multi-prolonged strategy is required to make science journalism effective in our society for that scientific platform should be created to engage scientists and media practitioners to have close discourse on issues relating to scientific and technological developments in Pakistan.

Published on: 13th December, 2015

Science & Technology For National Development – Strengthening The S&T Road Map

"The revolution in communication, energy, environmental sciences and other aspects of science and technology has imparted an importance to S&T considerations in foreign affairs undreamed of a generation ago." **– George Shultz**

Prior to the nineteenth century, investment in human capital was not considered especially significant in any country. Similarly, expenditures on schooling, on-the-job training, and other related forms of investment were pretty undersized. This began to transform drastically during this century with the application of science and technology (S&T) to the development of new goods and more efficient methods of production – research and development (R&D). During the twentieth century, education skills, and the acquisition of knowledge have become crucial determinants of a person's and a nation's productivity. One can even call the twentieth century the "Age of Human Capital" in the sense that the prime determinant of a country's standard of living is how it succeeds in developing and utilizing the skills and knowledge, and furthering the education and health of the majority of its inhabitants. The astonishing evolution in different fields of S&T have had a deep impact on our lives in approximately every subject of our activity, such as health, agriculture, communication, transportation, security and defense. These progresses have been obsessed by an ever-growing degree of exhilarating discoveries, principally emanating from science laboratories in the West, and by their transformation into new products or processes that have flooded world markets. These floods in turn shower gigantic economic rewards on those nations that have the will and vision to make S&T the cornerstone of their development agendas.

The world is today piercingly divided by a technology frontier that separates the technologically advanced countries from the technologically backward ones. The developed countries have been able to use their scientists and engineers for speedy economic growth, whereas the so-called developing countries are relegated to the role of consumers of technological products. They become almost entirely dependent on the advanced countries for most of their needs, be they chemicals, biomedical, pharmaceuticals, engineering goods, transportation equipment, or defense equipment. In the course, more and more funds from developing countries are being transferred to developed countries, raising the level of poverty in the developing countries. Hypothetically, the first decade of the twenty-first century has seen the global center of gravity shift toward the Asia-Pacific region. Its population already accounts for more than half of the world's people and is anticipated to surpass the collective Western World by 2030. The Asia-Pacific is home to the fastest escalating economies in the world and its collective share of global GDP is quickly impending 40 percent. The region has also developed an elaborate system of organizations on S&T, R&D, economic and security matters, promoting continual development and political strength.

Consequently, dependence on S&T as an instrument for achievement of national development goals is a phenomenon seen all over the word. In Pakistan, due to negligence and faulty vision of planners in governments and bureaucracy, the S&T, R&D sector was never given the status mandatory to efficiently use it as a contributor to national development. The current level of S&T efforts in the country in much below the requirements as compared with regional countries and the scientific and technological gap is widening with the passage of time. That's why, to live in the twenty-first century with grace, the immediate formulation and implementation of a well thought-out,

well-planned science and technology strategy is urgently needed. In this regards, to strengthening the S&T Road Map, the Government of Pakistan (GoP) and S&T authorities may perform the following role:

- The government should develop and implement policies that will strengthen Pakistan science and engineering through international cooperation. And, should have mechanisms to participate in the key fields of research cooperation for the world scientific enterprise.
- The government should muster as much reasoned long-range anticipation as possible about how science and technology may be applied to any and all Pakistan interests.
- The government should use the Pakistan science base for shorter-range problem assessment. The nation's scientists and engineers assist the government's officials, acting as referees and analysts of information with respect to current international issues.
- The government should monitor S&T developments abroad and understand the S&T, R&D strategies of other nations and regional groupings.
- The government should plan to take joint action with other nations to address transnational problems, through the necessary bilateral, multilateral frameworks. And, identify the critical needs and provide high-leverage technical cooperation with developing and regional countries.
- The government should use its technical expertise to support negotiation of new international agreements, conventions, and protocols and integrate expert knowledge in science and engineering into adjudication and regulation at the international level.

Published on: 16th March, 2018

Science For Society: Linking Science To CPEC

World Science Day for Peace and Development (WSDPD) has been celebrated every year, when United Nations Educational, Scientific and Cultural Organization (UNESCO) declared 10th November as the day dedicated to science. This day is celebrated so as to emphasize the importance that science has in modern-day society and to heave understanding of the function that science has in the promotion of peace and sustainable development. The core motive of the Science Day is the promotion and understanding of science among the society and general public to make them realized why science is relevant to their daily lives and to engage them in debate on science related issues.

LINKING SCIENCE TO CPEC, PUBLIC UNDERSTANDING OF SCIENCE AND THE PARTICIPATION OF CITIZEN OF THE BOTH COUNTRIES IN SCIENCE SHOULD BE A CONSIDERABLE FACTOR FOR SUSTAINABLE AND PEACEFUL DEVELOPMENT OF CPEC.

The global nature of science, the speed with which it is developing and spreading, and the extent it is critical to national priorities are leading more countries to look at the techno-economic mechanism of their science strategies. Science exchanges are an essential platform for countries looking to create better connections with the public of other nations, and to establish and strengthen relationships. With multiple socio-economic challenges faced by the world today, scientific interactions are valuable platforms for states and scientists to cooperate and share knowledge, expertise and resources. In turn, this can promote techno-economic and social progress, and contribute to peace and sustainable development. Science can not only enable

countries to overcome a negative image in parts of the world but also, take place in the long-established sense of the word, where delegations travel to each other's countries to share ideas on science, innovation and technology.

Historically, integration between regions has been a key element in enhancing scientific activities and the cooperation long been facilitated by the diverse means of research and development (R&D). In the South Asia, there is exceptional Chinese cooperation with Pakistan for the 21st Century Silk Road – the global Belt and Road Initiative (BRI). China and Pakistan as all-weather strategic partners and glorious friends always try to make strong relations through different geo-politics and strategic agreements. The China-Pakistan Economic Corridor (CPEC) is one of the imperative strategic partnerships to make stronger relations of both countries. Similarly, China has several science exchanges with Pakistan, with the key role in setting the stage for R&D, institutions and businesses to collaborate with each other. In the future scenario, the strategic scientific partnership through CPEC may not only develop Pakistan's science infrastructure and research capabilities, but also techno-economic development of both the countries. By creating science knowledge and understanding through science may outfit both countries to find solutions to today's techno-economic challenges and to achieve sustainable development and greater societies. Linking science to CPEC, public understanding of science and the participation of citizen of the both countries in science should be a considerable factor for sustainable and peaceful development of CPEC. The CPEC could then not only serve as a game changer for China and Pakistan, but also the entire region.

Published on: 11th November, 2018

Linking Science To CPEC From Concept To Reality!

GLOBAL ALERT: 'This is the year 2099, welcome to our trip to the Jupiter. In this trip, first you will have the experience of your life – the moon walk, without gravitation. Afterward, our lunch and dinner will be in the most beautiful places of Mars. Next, we will start our voyage to the Jupiter on the same night. However, before the entrance, please make two lines; those people from United States, Canada and European Union, please follow the green line and enter directly after showing your IDs. The other please follow the red line, and answer the questions of the NASA representatives truthfully' … 'The space research of NASA is rolling every day which could make traveling to outer-space more conceivable in this century. If we want to have equal rights in the future, we ought to work very hard for catching up scientific and technological advancements.'

CONTEMPORARILY, THE IMPORTANCE OF SCIENCE AND TECHNOLOGY TO MODERN SOCIETIES AND THE ROLE OF A SCIENTIFICALLY LITERATE POPULATION IN PROMOTING SOCIO-TECHNO-ECONOMIC DEVELOPMENT HAVE LONG BEEN RECOGNIZED.

The text above intended to present the interaction of science communication, hereafter SciCom, with the public by using cultural references. Even though, the main information of the text is about the space researches of NASA, the imaginary story that has written is schematized in a way to capture the perception of the public. The communication of science and technology, science popularization, plays a central role in the socio-techno-economic, cultural, and environmental development of any

country. In socio-techno-economic terms, the SciCom makes it possible to develop a scientific culture in the society, develop scientific literacy and motivate talent for scientific research, technological development, and intellectual endeavors. It also fosters creativity and innovation contributing in the production of better trained human resources, expands social opportunities and strengthens the educational system. Culturally and environmentally, the science popularization enhances the critical sense of population, by increasing its involvement in informal decision-making and contributing to sustainable development and democratic stability.

With that in mind, the China Centre for International Science and Technology Exchange (CISTE), Zhejiang Association for Science and Technology, Zhejiang provincial S&T department and Hangzhou Association for Science and Technology organized the seminar on China-Pakistan Science Communication in Hangzhou City, Zhejiang Province on May 21-24, 2019 under the guidance of the Department of International Affairs of China Association for Science and Technology. The seminar was attended by all stakeholders, science and technology organizations, government agencies, science museums, media and enterprises, multidisciplinary group of researchers, and experts from several leading academic and research institutions in China to discuss the significance of China-Pakistan cooperation on science popularization to the building of China-Pakistan Economic Corridor (CPEC). The aim of seminar was to share experience on SciCom, enhance the mutual cooperation, improve research reporting and communication, and advance the scientific literacy of people of both countries.

The exchange of insights and dialogues held during the seminar provided a platform for the stakeholders to share their vision and experience, and to develop the mechanism for future cooperation for

SciCom innovation, science popularization planning, and the integration of science, technology, innovation and culture. Correspondingly, speaking at the Hangzhou Low Carbon Science and Technology Museum, Sayyed Paras Ali (President SciTech Media) proposed the concept of China-Pakistan Network on Science Popularization (CPNSP) with the aim of learning and deploying SciCom and science popularization between China and Pakistan as a flagship project of Belt & Road Initiative (BRI).

Contemporarily, the importance of science and technology to modern societies and the role of a scientifically literate population in promoting socio-techno-economic development have long been recognized. In this regard, the following strategies and recommendations are suggested for better linkages and activities for further development of SciCom and science popularization in the both countries:

- Science network must be developed for fast exchange of ideas and experience between China and Pakistan. Such as, proposed China-Pakistan Network on Science Popularization (CPNSP).
- Governments of both countries (especially Government of Pakistan) should establish or support organizations to train science communicators and science writers/scientists being basic resource for any activity of science popularization.
- Science communication wing may be formed and exchange programs may be devised for students, science communicators, scientists and journalists to visit and spend some time in both countries.
- Joint training workshops on various aspects of science popularization, science writing, and science journalism may

be organized on regular intervals. Support from governments and science organizations may be harnessed for this purpose.

- An annual event, like China-Pakistan Science Festival or Congress may be planned to be organized by rotation in both countries. And, SciCom awards may be instituted to encourage talented science communicators in both countries.

Published on: 13th June, 2019

Pakistan-China: A Science & Technology Based Comparison!

On 25th September, 2019 Prof. Engr. Zamir Ahmed Awan (Sinologist, ex-Diplomat) wrote an article, China-India: A comparison <https://moderndiplomacy.eu/2019/09/25/china-india-a-comparison/>. In the article he proclaimed, the Western world is supporting India to counter China as a competitor. Similarly, in the perspective of US universities, he stated, US universities attracts Indian talent for their own benefits, expressly, in the technology transfer and defense segment to develop quality human resource. Moreover asserted, *"All defense capabilities acquired by India are aimed anti-Pakistan"*.

My pivotal argument to write this article is not to discourse the Western world but, intellectuals from Pakistan and to analyze the pinch-point of stated article e.g. *"People of China are enjoying prosperity, and can be witnessed by their luxurious life style, purchasing power, food style, tourism and lavish entertainment industry. India has no capacity or potential to compete China"*. My interrogation is, do Pakistan has potential to compete China, or even, India in the field of Science and Technology (S&T)?

In recent years, China has emerged as a new science and technology (S&T) powerhouse. A key indicator of the rise of China in science and technology (S&T) is its spending on research and development (R&D). Chinese R&D investment has grown remarkable over the past two decades. China is now the second-largest performer in terms of R&D spending, and accounts for approximately 20 percent of total world R&D expenditure. China's rise in S&T is not an accident. Successive Chinese leaderships have seen S&T as essential to socioeconomic growth and have accordingly taken steps to develop the country's

S&T-related infrastructure. S&T enlargement and innovation figure outstandingly in the current thirteenth five-year plan (2016-20). China's National Medium-and Long-Term Program for Science and Technology Development, is a striving plan to transform the Chinese economy into a major center of innovation by the year 2020 and make it the global leader in S&T and innovation by 2050.

As a matter of fact, scientific knowledge and its use in innovation, technology and socioeconomic development have become increasingly global. Quantum computing and communication, artificial intelligence, robotics, big-data mining, the search for dark matter, genetic and biomedical engineering, brain science – and the list of potentially escalating research goes on. Each has momentous implications for future industries, defense technologies, societal and economic development of any state for the sovereignty, prosperity and luxurious life style of its citizens. And, surprisingly, the remarkable achievements in these fields are coming not from the great centers of science in the West, but Beijing, Shanghai, Hefei, Shenzhen, Wuhan and a number of other Chinese cities.

Accordingly, S&T played a vital role in the rapid socioeconomic development of China. This is the reason citizens of China are enjoying prosperity and living luxurious life. The Chinese development mold has proved successful in past few years, Pakistan shouldn't seriously learn from it? Pakistan is still passing through its worst economic crisis, governance crisis, health crisis, and unemployment etc., primarily caused by corruption, nepotism and weak institutions. By keeping eye on new geopolitical scenarios, Pakistan need not to devise a new National Action Plan for Science, Technology & Innovation (ST&I)? It may be anticipated, Pakistan will take off economically if science and technology (S&T), research and development (R&D) will be focal-point of the engine of development.

There is no short cut on the path of productive, sustainable and socioeconomic development. China has proved it through its hard-earned position. The road for Pakistan will not be dissimilar. In order to develop a strong economy and socioeconomic development, Pakistan need to follow China's example and make ST&I and R&D the focal point for socioeconomic development of citizens.

Honestly speaking, slogans "All-Weather, Time-Tested, All-Dimension, Sweeter Than Honey, and Higher Than The Height Of Himalayas and Deeper Than The Depths Of Arabian Sea" about friendship with China are very popular in Pakistan and Pakistani politics, but politicians, executives, policymakers, economists, educationalists have never made an effort to truthfully learn lessons from the world's second largest economy and science, technology and innovation (ST&I) raising power. Thus, knowing the ground realities, as a litmus-test, I appeal not to Western world but my own people to bring "National University of Science and Technology (NUST)", the prestigious university located in the heart of capital city of Pakistan, in the top 100 ranking universities of world or at-least top 5 Indian universities in QS World University Ranking.

Published on: 29th September, 2019

Poverty Alleviation In China: Can Pakistan Learn Lessons From Poverty Alleviation Strategies?

"In a country well governed, poverty is something to be ashamed of. In a country badly governed, wealth is something to be ashamed of." **–**
Confucius

It is extensively acknowledged that poverty, inequality and growth are strongly intertwined and form a complex set of triangular relations. Among the most significant is the identification that growth can contribute to poverty reduction but only if the reimbursement of the growth can reach everyone in society. Exclusively, in the case of absolute poverty, it means only if growth can help those living below some nationally or internationally specified poverty line of income escape from such poverty, and embark on some self-sustaining process of self-development and self-realization.

Since the mid-1980s China has developed an extensive officialdom committed to poverty alleviation. The State Council authorized the Leading Group for the Economic Development of Poor Areas (LGEDPA) as the top anti-poverty decision-making body leading to synchronize anti-poverty programs at ministerial levels. During the last three decades, the achievements of China against poverty have fascinated the concentration of social scientists, economists, and international organizations to draw some lessons for developing countries to fight against poverty in their own settings. Over the last 30 years, China has undergone a profound economic transformation and lifted hundreds of millions of people from poverty. This process has reshaped the global economy and changed the economic perception for nations and people all around the world.

On 16th October 2016, President Xi Jinping announced on China Central Television (CCTV) that he would eliminate poverty in China by 2020. Determinately, China has become the first middle income country to achieve the first Sustainable Development Goal of eradicate poverty with many pioneering and effectual practices in targeted poverty alleviation. In the course of realizing the "Two Centenary Goals" and the Chinese Dream of revitalizing the nation, it is paying attention on safeguarding and civilizing people's well-being, proliferating all social programs, and caring people's rights to equal participation and development.

At the 2017 China Poverty Reduction International Forum in Beijing, the Chinese government launched the Global Poverty Reduction Online Knowledge Sharing Database. China's Internet-based poverty alleviation technique has set an archetype for the rest of the world. As China continues to take a more vigorous role in poverty alleviation on the global stage, it is an ideal position to be a close collaborator with other developing countries and share the lessons it has learned from its own poverty reduction experience. The Chinese Government has been pushing forward its "Internet Plus" strategy in poverty reduction efforts. It has accelerated the government's poverty reduction efforts in rural areas. According to China's Ministry of Commerce, more than 150,000 poverty-stricken families joined the e-business sector in 2016-17 and the government is planning to take e-business to more than 80% of villages by 2020.

- ✓ **China's Poverty Eradication Achievements:**

The 2030 Agenda for Sustainable Development, with poverty reduction as its primary goal, demonstrated the confidence and determination of the international community in jointly eradicating poverty and achieving common development. As the world's largest

developing country, China has always attached great importance to poverty alleviation and development.

- Over 700 million people reduced poverty according to China's national poverty line.
- The rural poverty-stricken population was reduced to 30.46 million by the end of 2017, with the poverty incidence dropping to 3.1%.
- According to the 1.9 dollar poverty line, China lifted 850 million people out of poverty, with the percentage of people living in extreme poverty falling from 88% to 1.85%.
- China has contributed to over 70% of the poverty reduced across the world, making itself a country with the most people lifted out of poverty in the world.
- Providing 120,000 opportunities and 150,000 scholarships for citizens of developing countries to receive training and education in China.
- Increasing investment in the developing countries to 12 billion dollars by 2030. Setting up the Assistance Fund for South-South Cooperation with an initial pledge of 2 billion dollar to support developing countries in implementing the 2030 Agenda for Sustainable Development.

[International Poverty Reduction Center in China (IPRCC)]

The nitty-gritty of Chinese success, in poverty reduction, are rooted in its firm political willpower and commanding organizational capability, which ensured macroeconomic stability and successful poverty alleviation policies at the macro level, and empowered the poor at the micro level. As Pakistan's new government has formed, now there is a need to revive pro-poor policies beyond traditional ways to achieve objectives which must be in Pakistan's best interest

and that will benefit the poor people of the country. In Pakistan welfare plans will get a tremendous boost if it can learn lessons from China's experiences and achievements in poverty alleviation through the Poor Rural Communities Development Project, the Southwest Poverty Reduction Project, the Qinba Mountains Poverty Reduction Project, the Gansu and Inner Mongolia Poverty Reduction Project, the Guangxi Rural Poverty Alleviation Pilot Project etc. It is important to note here, policies and programs have also been launched in Pakistan by previous governments, but they have not brought any real change in poverty, mainly due to poor governance and weak institutions, policy gaps, poor implementation and corruption, low public spending and nepotism, population pressure and internal conflicts.

In a nut shell, China's best practice and successful experience in poverty reduction should be a "Role Model" for Pakistan where almost 75% of the poor are clustered around the poverty line. According to the Ministry of Planning, Development and Reform report, 39% of Pakistanis living in multidimensional poverty and 20% slightly above the poverty line. With a truly astonishing reputation, China is irrefutably a world-leader in poverty reduction and there is a lot the rest of the world can learn from its experience, including Pakistan.

Published on: 31st July, 2018

Technology Transfer – An Approach For Nation Progress

The rapid expansion of science and technology started about three hundred years ago in seventeenth century. Since then science has built up an extensive body of knowledge about the world and about the history of man, the earth, the solar system and the universe. Science and technology are crucial to the development prospects of developing countries in two different ways. First, science and technology can provide tools that help alleviate the specific problems that afflict many poor countries and delay their development prospects, such as disease, lake of infrastructure (information, transport, energy, etc.). Second, science and technology are central to the dynamics of economic development itself. Economically successful countries are those that are able to turn technical innovation into economic productivity. Successful technology transfer from developed countries to developing countries can improve the live and economic growth as technology transfer is the process of sharing of knowledge, skills, methods of manufacturing, samples of manufacturing and facilities among governments and accessible to a wider range of users who can then further develop and exploit technology. At the same time, technology transfer is not a process that characterizes a stage in the development of the Third world but, it occurs constantly in the First World as-well. In theory, technology transfer is closely related to the diffusion of innovations.

TECHNOLOGY TRANSFER IS AN IMPORTANT ISSUE AND KEY COMPONENT OF ECONOMIC AND SOCIAL DEVELOPMENT OF DEVELOPING NATIONS.
IT IS OBVIOUS THAT THE TECHNOLOGY TRANSFER FROM THE DEVELOPED COUNTRIES TO DEVELOPING COUNTRIES IS NOT A STRAIGHTFORWARD MECHANISM.

The inclination of developed countries to facilitate access to and transfer of technology to developing countries is reflected in a number of international agreements. These agreements identify that technology transfer to developing countries is important to facilitate their integration into the global economy, and meet their international obligations and commitments. They also recognize that technology transfer is important in facilitating the creation of a sound and viable technological base in developing countries. Since the time of independence in 1947, science and technology in Pakistan has seen many ups and downs throughout its history because Pakistan inherited very few folks those were capable of scientific development and technological research. But, in the past few decades, Pakistan has made noticeable progress in technological development. The existing institutional skeleton for Science and Technology in Pakistan comprises governmental and non-governmental institutions. In 1964, the Scientific and Technological Research Division was established for coordination and implementation of national science and technology policy, and to promotion of research and utilization of the results for coordination of utilization of scientific and technological manpower.

Technology transfer is an important issue and key component of economic and social development of developing nations. The successful implementation of technology depends not only on good technical specifications, but also on the right social, political, and institutional environment. The existing type and capacity of educational institutes in developing countries are not sufficient. Educational institutions in developing countries should be provided with modern computer and information technologies (ICT) facilities to enable hands-on practical training and special attention should also be paid to on-the-job training. The training of technologists and operators which forms the basis for the implementation of a new technology has to be given a high priority.

It is obvious that the technology transfer from the developed countries to developing countries is not a straightforward mechanism. Keeping in view the importance of problems relevant to the technology transfer, many developing countries have established institutions for public support. The situation demands that the government of Pakistan must establish institutions, with proper technical manpower to deal with the problems relevant to foreign technology transfer. The institutions may facilitate the local industry and other technology users in the following ways:

- Locating the proper information sources of foreign technologies.
- Facilitating industrial sector in pricing the international technology.
- Establishing a complete coordination between technology venders and users.
- Conducting research studies for technology transfer in various sectors.
- Making proper arrangements for assessment and evaluation of technology in terms of its effect on environment and society.

On the basis of above arguments it is important that for successful technology transfer there is an urgent need for the establishment of some institutions with appropriate policy across Pakistan to deal with various aspects of technology transfer to maintain scientific growth in country.

Published on: 10th September, 2012

3S Technology – Implementation For Disaster Management In Developing Countries!

Disaster whether natural or man-made play wreckage role with the lives of millions of people every year around the globe. Their aftermath is nothing but a harsh picture of destruction, death, and misery. Today it is proven truth that natural disaster can happen at any place irrespective of the developed, developing or the least developed status of a country and it is also experienced that the least developed and developing countries are impacted more severely by large scale natural disasters. It is not always possible to avoid disaster but the sufferings can be reduced by appropriate disaster management through proper disaster management tools. The advancement in Information and Communication Technology in the form of GIS, Remote Sensing, Space Technology etc, can help a great deal in planning and implementation of disaster reduction procedures.

> *"AN INVESTMENT OF $1 IN ICTS USED FOR DISASTER MANAGEMENT THROUGH MONITORING AND RESPONSE COULD SAVE $14-$22 FOR REHABILITATION AFTER THE DISASTER". – ITU*

Space-based ICT applications are playing an explicit role in providing information, information services and decision support tools for disaster management in developed regions of the globe. Procedures such as continuous information acquisition over a broad geographic area, as well as distribution of information services and applications to remote and less serviced areas, chiefly promote from this technology. The rapid development of space-based ICT and the integration of remote sensing, Geographic Information System (GIS),

and satellite position system, collectively known as 3S technology, have created a solid foundation for effective disaster information and monitoring management in developed world. 3S technology functions have being extensively utilized in two broad areas of disaster management. The initial deals with uplifting awareness, and includes preparations and planning to decrease vulnerabilities while, among other things, an understanding of the process, modeling, monitoring, early warning systems, forecasting, and hazards risk mapping.

As declared by United Nations Development Programme (UNDP), 24 out of 49 least developed countries, most of which are in Asia and the Pacific, face high levels of disaster risk, therefore the technology that is enabled by satellites holds great potential to meet significant needs in developing countries. Specially, satellite-based remote sensing, communication and navigation capabilities can provide valuable services in the developing world. Unfortunately, the potential of these technologies is not fully met due to different obstacles that prevent developing countries from making use of such technology. These barriers include lake of access of funding, expertise, infrastructure, equipment and education. According to research done with the International Telecommunication Union (ITU) has proven that an investment of $1 in ICTs used for disaster management through monitoring and response could save $14-$22 for rehabilitation after the disaster.

In recent years Pakistan has suffered a series of natural disasters, including the 2005 earthquake and floods in 2010 and 2011. These calamities killed thousands of citizen and cost millions by destroying large-scale infrastructure, housing, live-stoke, agriculture and other assets. Since Pakistan is situated on major earthquake fault lines, the likelihood of similar tragedies in the future remains significant. Pakistan still lack in a systematic and organized approach towards

managing the effects of natural disasters. However, the National Disaster Management Authority (NDMA) which is the executive arm of the National Disaster Management Commission (NDMC) headed by Prime Minister, has been assigned the task of coordinating the disaster risk management at the national level, implementing disaster risk management strategies, mapping the hazards, developing guidelines and ensuring the establishment of Emergency Operation Centers (EOCs) at provincial, district and municipal levels. Despite establishment of this organization assigned with apparently various tasks, disasters in Pakistan are barely managed efficiently. According to the government, a lot of work is under way but, the last budget couldn't allocate significant money for IT or telecommunication sector to build efficient disaster management structure to overcome the natural disasters. Keeping the current ICT infrastructure of the country in mind, especially in the rural areas, such digital rescue operation is a myth, away from reality.

In the light of above facts, it is obvious that Pakistan is in ominous need of an organized disaster management programme to face the emergency situations. Government of Pakistan must reinforce its disaster management policies and build up institutions to not only tackle such situations but also make them best use. It is high time that the government as well as citizen of Pakistan play their own respective role to bring about a positive change!

"A nation that continues year after year to spend more money on military defense than on programs of social uplift is approaching spiritual doom". **– Martin Luther King Jr.**

Published on: 13th November, 2012

ICT In Education: Transforming The Learning Environment

"Those who know cannot be like the ones who do not know. Of course, knowledge and ignorance are like light and darkness which can never be alike" ***– Holy Quran***

Education is the most important aspect that plays a principal role in human development. It endorses a productive and informed citizenry and creates opportunities for the socially and economically deprived segment of society. The development of a nation depends on its system of education, as it develops capacities in the individuals and enhances inner-strengths – intellectual, political, social and economic against, domination, exclusion and discrimination. Educational development occupies an important place at the apex of the all development segment pyramid and helps to develop the cream of the society – a selected group of individuals – physically, intellectually, emotionally and socially.

"There is no doubt that the future of our State (Pakistan) will and must greatly depend on the type of education we give to our children and the way in which we bring up as future citizens of Pakistan" ***– Quaid-e-Azam Muhammad Ali Jinnah (All Pakistan Education Conference, Karachi)***

Education is a dynamic process. Every human being is born with talents. Education exploits these talents in a healthy, integrated and balanced manner. According to the UNESCO Commission on Education "educational institutions are a decisive factor in training men to contribute to the development of the society, to play an active part in life and in properly preparing men for work". Therefore, spread of education is a sin qua non both for modernization and sustenance of democracy and also to make man "*be himself*" and "*to become himself*" **(UNESCO, 1979)**.

Innovation in science and technology is transforming the world at an astonishing rate. Development in computing and communication, in

particular, are helping to accelerate these challenges. As we move into 21st century, we observe ICT has changed many aspects of the way we live. If anyone tends to compare such fields like banking, business, engineering, medicine, tourism, law, the impact of ICT across the past two or three decades has been enormous. The way these fields function today is enormously different from the ways they operated in the past. In recent years many hypothetical and practical efforts have also been made to assess the impact of ICT on educational reform process for both access of education and quality of education because, among all the development sector education sector is primarily the most attentive sector connects to improve the efficiency, accessibility and quality of the learning process.

People in present society are becoming more and more familiar with ICT as ICT refers to *'the technology that enables communication and transmission of information'*. When implementing the ICT in the education sector, there are considerable challenges such as cost, internet access, training and policy issue, and each issue has its own ways of addressing which is valuable to apply around world. However, all these challenges for development through applying ICT to the education sector must consider the environment that each country faces, because the situation of each nation is totally different from each other. ICT can transform the learning environment in the following ways:

- **Active learning:** ICT can increase learning mobilization tools for examination, calculation and analysis of information, thus can offer a platform for student inquiry, analysis and construction of new information.

- **Collaborative learning:** ICT can support learners through interaction and cooperation among students, teachers, and experts regardless of where they are. It can also provide opportunity to work with people from different cultures.

- **Evaluative learning:** ICT can permit learners to explore and discover rather than merely listen and remember and it can recognize that there are many different learning pathways and many different articulations of knowledge.

Consequence of education for human development does not need any clarification. For developing countries like Pakistan ICTs have the potential for increasing access to and improving the relevance and quality of education. Government of Pakistan accepts education as the fundamental right for its citizens, yet it has an unimpressive track record of provision of literacy at the grass-root level. Consequently, the reality of the Digital Divide – the gap between those who have access of technology and those who do not – means that the prologue and inclusion of ICTs at different levels and in various types of education will be most challenging activity. Failure to meet the challenge would mean a further widening of the knowledge gap and the deepening of existing economic and social inequalities between the developed and developing world.

"Let us recall on International Literacy Day, that literacy for all is an integral part of education for all, and that both are critical for achieving truly sustainable development for all"

Published on: 6th October, 2012

Connecting Rural-Urban Divide Through ICT For Better Life

The International Telecommunication Union declared the 17th May, the World Telecommunication and Information Society Day (WTISD), as a day to raise awareness on the benefits of ICT tools such as the television, radio, mobile phones and the Internet and other means of bridging the digital divide. Last year the theme for World Telecommunication and Information Society Day (WTISD) was "Better life in rural communities with ICTs". This theme was especially significant to a country like Pakistan, where 63% of the population resides in rural areas. It is an acknowledged fact that in spite of best efforts by the Government, rural areas continue to lack adequate infrastructure in terms of roads, financial services, health and educational facilities, employment opportunities and government services etc. Pakistan today stands at the threshold of great chance. A growing and robust economy, a young and increasingly literate population and wide technological base give it the opportunity of emerging as a major power. At the same time, it faces the challenges of reducing poverty and inequity.

ICT CAN OVERCOME EVEN LITERACY AND LANGUAGE BARRIERS AND PROVIDE A TWO-WAY COMMUNICATION CHANNEL BETWEEN THE GOVERNMENT AND RURAL CITIZENS.

ICTS AND RELATED E-APPLICATIONS ARE KEY INSTRUMENTS IN IMPROVING GOVERNANCE AND RURAL SERVICES.

World over, it has been recognized that Information and Communication Technologies play a significant role in bridging the

divide between the poor and the non-poor. In our country, while voice communication has, without any doubt reduced isolation, the penetration of Internet and broadband has remained low, mainly due to a limited spread of wire-line telephones and non-availability, so far, of Broadband technologies. With the launch of 3G services, the stage is set for rapid spread of Broadband. Simultaneously, there is an urgent need for a nation-wide Broadband network to reach education, healthcare, banking and other services to all the villages. In the rural environment, ICTs provide enhanced opportunities to generate income and combat poverty, hunger, ill health and illiteracy. ICTs and related e-applications are key instruments in improving governance and rural services, such as providing community health care, safe drinking water and sanitation, education, food and shelter; improving maternal health and reducing child mortality; empowering women and the more vulnerable members of society; and ensuring environmental sustainability.

The UN Summit on the Millennium Development Goals (MDG), from 20-22 September 2010, concluded with the adoption of a global action plan to achieve the eight anti-poverty goals by the 2015. The eight goals agreed to by the members are to: Eradicate extreme poverty and hunger, Achieve universal primary education, Promote gender equality and empower women, Reduce child mortality, Improve maternal health, Combat HIV/AIDS, malaria, and other diseases, Ensure environmental sustainability & Develop a global partnership for development. Information and Communication Technologies (ICTs) are part of MDG and have an impact on other MDGs. Target 18 of goal 8 mentions the following: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications technologies. According to UN availability of broadband is important for making important

applications available to the population. Examples below show as to how ICT can assist in achieving other MDGs.

i. Eradicate extreme poverty and hunger - By increasing access to market information and reducing transaction costs for poor farmers and traders.
ii. Achieve universal primary education - By increasing supply of trained teachers through ICT enhanced distance training.
iii. Promote gender equality and empower women - By delivering educational and literacy programme specifically targeted towards poor women using appropriate technologies.
iv. Reduce child mortality - By increasing access of rural care givers to specialist support and remote diagnosis.
v. Combat HIV/AIDS, malaria and other diseases - By increasing monitoring and information sharing on disease and famine.
vi. Ensure environmental sustainability - By remote sensing technologies and communications networks which ensure more effective monitoring, resource management, mitigation of environmental risks.

Information and Communication Technologist are of the opinion that the impact of broadband on the GDP is much higher than any other ICT. According to World Bank a 10% increase in broadband penetration increases GDP of a developing country by 1.38%. It is therefore expected that countries are concerned about creating a robust broadband infrastructure that would sustain high growth of broadband services. The inclusive potential of ICT is evident at two levels: the benefits that it brings to poorer communities and the capacity of individuals within these communities to participate in

new economic opportunities. ICT, particularly broadband, is, therefore, seen as a powerful tool for extensive growth.

ICT has the unique capability of bridging the urban-rural infrastructural gap in access to such services and facilities. ICT can overcome even literacy and language barriers and provide a two-way communication channel between the government and rural citizens. It can empower rural Pakistanis through information and market access, while connecting rural populations will ensure that they participate as equals in the social, economic and political life of the nation. The initiatives should be taken from both private and Government sectors for development of ICTs in rural areas. Through all these measures, it can be expected that we will be able to lead in a new era whereby rural Pakistanis will be able to access to information, knowledge and all types of essential services through effective ICT connectivity and thus be able to contribute effectively to and reap the benefits of to the promising Pakistani growth story, and realize vision of Father of Nation Quaid-E-Azam Mohammad Ali Jinnah.

Published on: 16th January, 2012

Women In ICT: Myth And Reality In Developing Regions

Nowadays it is well-known that Information and Communication Technologies (ICTs) can give new opportunities for development to everybody. Yet, lack of access to them in developing countries creates difficulties to people for individual and social advancement as well. Women in developing regions occupy the highest level of the digital gender divide because of huge responsibilities for their families and kids at home that causes challenges for them in education, employment, participation in governance and business. Women have always had important role in educating our young children and developing our societies it is obvious that empowering them with new tools and values will surely help them contribute to the competitiveness of our economies and to building new generation which can fully understand the new challenges of the technological world of the developing regions. Needless to say that today there are many barriers to women's access to ICT especially in developing regions because ICT is considered by the majority of people as a primarily male industry. Women are underrepresented among ICT users and very rarely work as developers. In some countries cultural norms and even concerns over personal safety may make it difficult for women to attend training courses.

THERE IS A GROWING REALITY THAT WOMEN'S ENGAGEMENT IN ICTS IS IMPORTANT FOR MULTIPLE FORMS OF DEVELOPMENT, INCLUDING SOCIAL AND POLITICAL JUSTICE AS WELL AS ECONOMICAL DEVELOPMENT.

Over the last twenty years many intervention programmes have been implemented to increase the number of women in the Information

and Communication Technology (ICT) profession. In 1995, the United Nations Commission on Science and Technology for Development (UNCSTD) recognized the growing influence of ICT in development and the importance of women's participation in discussions regarding its integration globally. To that end, they established a Gender Working Group to address the significant gender issues from access to control. The United Nations Division for the Advancement of Women (DAW), the International Telecommunication Union (ITU) and UN ICT Task Force Secretariat released a report in 2002 that focused on ICTs as tool to advance and empower women. When the World Summit on the Information Society (WSIS) was established, a Gender Caucus was created to ensure women had a seat at the table and a voice in the room. The research showed that in developing countries women enjoy fewer benefits from ICTs than men, it is also found that gender-based obligations, societal biases, and even physical strength can restrict women's ability to learn about or use of new technologies. i.e.

- Women are responsible for running households, they are less mobile and have less free time than men, and therefore cannot easily take advantage of training and other resources;
- Male students discourage female students from accessing computers in labs by pushing them out of line;
- ICT use can shift family dynamics and the balance of power, causing conflict in the home which can lead to arguments, violence, divorce, and even death;
- Women often feel uncomfortable or annoying when visiting internet cafes on their own.

Women in developed countries are using ICT to expand their mission, drive their passion to improve the world form the grass roots. There is a growing reality that women's engagement in ICTs is important for

multiple forms of development, including social and political justice as well as economic development. However presently, the ICT sector does not take full advantage of female talent in developing countries. This is bad for the sector and bad for those women who could create new opportunities for themselves and their families with the ICT jobs that deliver better salaries and career paths than most other sectors. Despite the obvious benefits, many women never consider a career in ICTs particularly in developing countries because there is a lack of awareness among students, teachers and parents on what a career in ICT could offer.

Published on: 15th May, 2012

e-Judiciary – Modernizing Judiciary With Technology

"The future of law is not to be found in impressive buildings or leather bound books but in small pieces of silicon; in streams of light; and in millions of miles of wires and cable." **– Katsh**

Technological developments in the meadow of information and communication technology (ICT) and introduction of computers have made a turning point in the history of human civilization. It has brought about a change of tack in all fields of human activity and has resulted in enhanced efficiency, productivity and quality of output in every walk of life. Evolution in technology, particularly the growing use of internet, have created borderless "e-world" and paved the way for irresistible and unmatched changes in every phase of life, including justice. The information and communication technology (ICT) has been advocated in the developed countries for the last two or three decades and this scenario gained astounding thoughts to have technology combined in administration of justice.

ICT has an influential position to play in the modernization of justice, improving efficiency, transparency and effectiveness, and redesigning the judicial process to manage the delivery of justice. The use of ICT in this perspective may not only improve the efficiency and transparency of justice processes but also, enhance the interaction between citizens and public authorities. As a result, the concept of e-Judiciary comes in, and we should also keep in mind that e-Judiciary is not just about "e" or computers. Its basis is judiciary should be primarily concerned with providing justice to the citizens. It should fulfill what justice seekers demand from the system, that is, speedy less expensive, quality, corruption free justice. Principally, e-Judiciary is a process of modernizing judiciary that uses information and

communication technology (ICT) for its proceeding to provide justice to people.

Typically, e-Judiciary consists of Case Management System, Information Management System and Court Automation System. This process generally goes this way in order:

- ✓ Registering cases
- ✓ Managing cases
- ✓ Hearing of cases and handling post hearing and report

Judiciary in Pakistan urgently needs of re-engineering its course of action, modernize the use of its human resource and bring about change management by harnessing the potentiality of the available information and communication technology to its fullest extent. By using information and communication technology, an effective and efficient system of e-Judiciary can be develop and that system may possibly ensure that judiciary is accessible to all which is trusted by all and it is reliable to all.

The National Judicial Policy 2009 proposes to eradicate corruption and delays from the country's judicial system therefore, it is exceptionally significant for Pakistan to have well established e-judicial system on the pillars of speedy and transparent trial system in order to provide fair justice to the people. Although, Pakistan is a developing country as such, is not yet an advance in ICT innovations, but must not avoid the adoption of electronic method of justice delivery. The electronic methods will not only bring transparency, security of court's documents but also, swift dispensation of justice. Conversely, the successful implementation and adoption of electronic methods may be challenged by epileptic electric supply, network dysfunction, lack of IT skills, and absence of relevant legal framework.

There are many other challenges to implement e-Judiciary in Pakistan as-well i.e.

- Lack of long term strategy
- No provision for linking technology with performance
- No effective planning for the development of skilled HR development in ICT
- Problems in attitude to manage the change
- Commitment not to the extent of expectation

Finally, the construction and maintenance of the modern justice system will need extensive preparation and determination. There are already successful precedents in various countries for the use of ICT in judicial system such as European e-Justice (https://e-justice.europa.eu/home.do), European e-Justice Portal (http://ec.europa.eu/justice/criminal/european-e-justice/portal/index_en.htm), Hong Kong Judiciary (http://www.judiciary.gov.hk/en/index/), Indian e-Courts (http://ecourts.gov.in/), Mamibia Superior Courts (http://www.ejustice.moj.na/SitePages/Home.aspx) etc. Experience across the developed countries that have embarked on ICT in their justice systems show that ICT tools help to improve and develop the judicial process. For the reason, e-Justice should be a major priority for developing countries like Pakistan. Along with technological developments; institutional and social change within the judicial system should be considered, as well as the harmonization of laws to ICT. Moreover, the whole society has to keep up with the technological development. Social demand is as necessary as effective government determination to improve the administration of justice by ICT.

Published on: 7th January, 2016

Free, Fair & Transparent Election Without Technology?

"Elections matter, but how much they matter depends entirely on how free, open and fair they are" **– Elliott Abrams**

With the evolution in science and technology in today's e-society, modern information and communication systems that have resulted only do not offer easiness for people to find information, but also provides opportunity for people to articulate their wills. The exponential growth of information and communication technologies (ICTs), especially the internet has been useful and yielded positive impact. Numerous studies have witnessed these positive impacts, for instant, in healthcare, e-government and public administrations, education etc. In developed countries ICT have been valuable to the e-societies with e-services. ICTs have brought about a completely innovative and healthier government (e-government) that is seen to be more open to the needs and aspirations of society, more democratic, and more proficient. One key aspect of e-government is the enhancement of e-democracy that engages citizens to support the democratic decision-making processes and strengthen representative democracy through the use of ICTs tool. In particular, the application of ICTs on electoral processes in most developed countries, mainly, electronic voting (e-voting) have been remarkable.

In Pakistan, e-democracy and ICT applications in electoral process is at infancy phase where emphasis is gear towards providing public information and services, promoting citizen participation, building trust between government and citizens. Though, much has not been done to guard the integrity of elections i.e. voter registration and voting process but in the last general election perspective, some ICT

tools were used in registration verification process via SMS, relevant tools were not effectively employed during voter registration and voting. Furthermore, with the current electoral system in country, it is difficult, if not impossible to track down election frauds, implying that one voter, one registration or one vote is not guaranteed. Consequently, election frauds such as multiple registration, multiple voting, figure falsification and impersonation are not exception, though remains unobserved. Nevertheless, it is believe that when electoral system of this kind exit, the trustworthiness and the integrity of the elections can be threatened or lead to failures and corruption of democracy.

Since, ICTs have turned out to be a significant part of modern society, the term "electronic voting" has become widespread. The term "e-voting" refers to the integration of information and communication technology at one or more stages of the electoral process. It is generally used to describe any type of voting that involves electronic means. However, there are some differences in the definition of electronic voting in terms of the inclusion of the electronic apparatus in the recording of the vote – front-end of the election, or in the counting process – back-end. But, it is fact that when appropriate ICT tools (e-voting) are taken in electoral processes, it can go a long way to rid fraudulent elections practices and uphold its integrity. Electronic voting systems are characterized by the fact that they integrate ICT into the system, which establish many advantages in electoral process in the following ways:

- One of the most potential benefits is the increase in speed of the ballot tabulation process. As the votes are stored digitally and the counting procedure is mechanical, the waiting time for the result is reduced considerably.

- The increase in accuracy of the results is another advantage, but it depends on the kind of system used and design and conditions of the hardware and software, as well as human behavior.
- One key issue that has to be highlighted is the cost associated with electronic voting. The first investment that the government has to make is the purchase of hardware and software, which involves high costs. But it brings economics of scale as the increase of the size of the electoral roll does not increase the cost linearly. It also brings savings in the future elections as the hardware and software are reusable and because the ballots no longer have to be printed, but can now be shown on a computer or terminal screen.
- Accessibility is another added value for electronic voting systems, as it allows alternative ways to access the ballots. It decreases rates of abstention, especially when the remote voting method allows widespread technologies to be used, such as cell phones (for SMS voting) or the internet. The fact that voters do not have to move physically to a vote centre to cast their vote provides geographic independence and better accessibility for people with disabilities, increasing electoral participation.
- Given that the ballots are design through computer systems, multiple languages options can be provided on the ballot. If the system is user-friendly it will also offer more information about each candidate to help the voters in their selection.
- Electronic voting system can help prevent common errors as under-voting (voting for less than the allowed number

of candidates) or over-voting (voting for more than the allowed number of candidates).

Today's e-society obtaining benefits from ICT in various aspects of life ranging from getting ordinary public services to supporting everyday work. The impact of ICTs on elections has been valuable dramatically. It can be used to enhance the democratic process – engage citizens or build trust with the government. Trust building with ICT can also be extended to election process to promote its transparency. Pakistan's electoral system needs honesty and clearness in its election process and the transparency and trustworthiness of any electoral system is what characterized it to be free and fair which in turn, is one of the foundation stone of democracy. The fact is that, in any democratic society, free and fair election is linked to having a generally acceptable result that goes with organizing and conducting elections in an unbiased and fair manner, devoid of frauds or malpractices. This is because trust and confidence in democracy is only promoted when the electoral system process is transparent and open to all electoral stakeholders. As a nation, we must stand-up and prepare for our will to prevail through a trustworthy and credible electoral exercise along with transfer of power to the true representative not just to the national or provincial assemblies but, to the Union Council level. These are the concerns need observations in the Pakistan's electoral process and e-voting is solution for free, fair & transparent election.

Published on: 29th May, 2018

Muslims And Science: Should We Remain Backward?

"Wisdom is the lost property of believers" **– Prophet Muhammad (P.B.U.H)**

The Holy Prophet of Islam emphasized that the quest of knowledge and science is essential upon every Muslim, man and women. He strained his followers to search for knowledge even if they had to travel to China in its exploration. Here undoubtedly he had scientific rather than religious knowledge in mind, as well as prominence on the internationalism of the scientific quest. Ever since the dawn of human life on this planet, man has always strived to understand nature, his own place in the format of creation and the purpose of life itself. In the quest for truth, spanning many centuries and diverse civilizations, organized religion has shaped human life and, to a large extent, has determined the course of history. While some religions have been based on written text, claimed by their followers to be delightfully inspired, others have relied exclusively on human experience. There is nothing in the teachings of Islam that argue against learning, against science, and against technology.

IN GLORIOUS AGE OF ISLAM, MADRASSAS (RELIGIOUS EDUCATIONAL INSTITUTES) AS A STRONG EDUCATIONAL SYSTEM WERE THE CENTER OF EDUCATIONAL ACTIVITIES AND PROVIDED GUIDANCE NOT ONLY FOR RELIGIOUS MATTERS, BUT FOR WORLDLY AFFAIRS.

While we enter in the 21st century, Muslims are so backward, and they are treated with impertinence and they are suspect for terrorism. Muslims are also the most demoralized people anywhere in the world. The Muslim countries are weak and are unable to do anything

to defend themselves, their people and their fellow Muslims anywhere in the world. There was a time when most of the scientists in the world use to be Muslims and history tells us that they contributed extensively in the field of science and technology but the question is; how many "Muslim Scientist" do we have in the Modern Information Age? Does Islam tell us to remain behind in the fields of science and technology?

According to the famous physicist and Nobel Prize winner, Albert Einstein, "*Science without religion is lame. Religion without science is blind*". Religion has always played a vital role in shaping society through education. In glorious age of Islam, Madrassas (religious educational institutes) as a strong educational system were the center of educational activities and provided guidance not only for religious matters, but for worldly affairs. Students used to study science, medical and engineering courses, algebra, geometry, logic and philosophy alongside FIQH (Islamic jurisprudence) and IJTEHAD. The extensive and realistic nature of the syllabi enabled the students of Madrassa to be good doctors, engineers, architects, teachers, and statesmen. But, in the beginning of British rule, Madrassas began to lose their authority. The British built new educational system to train people in administrative interaction and divided the system of education into two separate domains: religious and secular, traditional and modern, old and new. However, directly or indirectly every Muslim had association with Madrassa education in every Muslim country and still there are number of young learner enrolling day by day. But, the question arises; are these Madrassas providing that level education through which students can contribute to modern world?

WHAT CAN BE DONE?

"…Inner experience is only one source of human knowledge. According to Qur'an there are two other sources of knowledge – Nature and History; and it is in tapping these sources of knowledge that the spirit of Islam is seen at its best…" **(Muhammad Iqbal, Reconstruction of Religious Thought in Islam)**

After the Second World War, most Islamic countries became independent from British colonial rule. But, the Islamic countries on the whole are far behind in Science and Technology as compared to developed countries. In the modern age, science and technology is playing an enormous function and providing great new opportunities to every nation in the world for developing and training new generation. The population of Islamic countries is largely comprised of youth and there is need to organize the youth to face the challenges of present age and future. To acquire technology optimally, Muslims must undertake a comprehensive literary program in all the basic sciences and engineering and there must be a strong connection between religious institutes (Madrassas) and modern universities. There must be a strong platform for youth of Islamic world to share their ideas and discuss the problems and challenges. In order to provide a dynamic technological change in the Islamic world, there is need to have a strong alliance between Islamic teaching and modern sciences. Muslims need to adopt the way Europeans did in the period of their revival. We must learn languages like English, German, French and Chinese as most of the knowledge and advance scientific literature is only available in these languages. Young scientist of Islamic world should come forward because this is the age of science and technology and like our ancestors we should take the lead in scientific study, exploration and knowledge. Intellectual Revival of

Muslims is the need of this time and every Muslim man's and every Muslim woman's prayer should be:

"My Lord! Enrich me with knowledge." **– Surah TAHA, 20:114**.

Published on: 2nd July, 2012

An Open Letter To Duke And Duchess Of Cambridge

Anmer Hall,
Kings Lynn and West Norfolk,
England, United Kingdom

Dear Uncle and Aunty,

Greetings,

This letter comes to you from your Pakistani nephew whom you do not know. I would like to thank you for visiting my motherland. For you it was, "Royal Tour", but for Pakistan, your visit was "the most complex tour" due to security and logistical considerations. According to reports, over 1,000 security personals were used to ensure your safety and protection. I am optimistic, you must have enjoyed five-day trip that covered more than 1,000KM from Islamabad to Lahore, and countryside in the North, and border regions to the West.

Uncle, by God you both are matchless. You both were constantly in breaking-news in Pakistani media and gossips about the dressing sense of Aunty Kate were in prime-time headlines. Undoubtedly, aunty was looking gorgeous in green "Shalwar-Kameez", a traditional style of dress for Pakistani women, which she dressed at "Emperor's Mosque". I am not sure either aunty was informed that her late mother-in-law also visited this Mosque during her trip?

Uncle, I would like to take an opportunity to tell you that one of my ancestors – Mughal Emperor, Aurangzeb built that Mosque in 1673 long-before "The British Raj" on the Indian subcontinent – "Golden

Bird" from 1858 to 1947. You should know why my country, sliced away from India, came into being and gained independence. I do not want to talk about bitter history, dim present and shady future! But, I want to show you the other side of picture that you missed during your "Royal Tour".

Believe me, uncle, at its creation, Pakistan inherited the British legacy of a parliamentary system. But, the parliaments (National or Provincials) are only debating and fighting club of elite. Sometimes, elections only commit to reshuffling of the same faces. However, presently Pakistan has a democratic system without democrats and it is hijacked by a small group of feudal lords, political elites, business groups and bureaucrats.

In 2019, Pakistan is facing terrible economic crisis, the economy has slowed down, the Rupee has been devalued, and there has been increase in the rate of inflation. Pakistan is also dealing with a balance of payments crisis, and system is ill-equipped to make changes which would avoid future excessive debt. In the second quarter of 2019, Pakistan had a current account deficit of $3242 Million. Part of Pakistan's financial crisis, global monetary tightening, reduced investor confidence, overvalued exchange rate, increased oil prices, and subdued interest rates have negatively impacted the country's already precarious economic situation.

The world's financial experts recently placed Pakistan on the list of countries that are supposed to face a serious food crisis. One of the basic reasons is soaring price due to gap in demand and supply of edibles. Pakistan is amongst the nations that likely to face food crises due to increasing prices of food commodities. According to a report, 80 million Pakistani are food insecure, while 95 districts face problems such as hunger and malnutrition-related disease. In the same way, 39

percent of Pakistanis live in multidimensional poverty. Pakistan's poverty index revealed that 4 out of 10 citizens live below the poverty line.

Pakistan could "Run Dry" by 2025 as its water shortage is reaching an alarming level. Pakistan is running out of drinkable water, and anticipated that it is likely to suffer a shortage of 31 million acre-feet (MAF). Massive water crisis have brought a new economic burden to citizens and have affected 14.91 million people in city of light – Karachi only. Electricity crisis in Pakistan is also one of the major reasons that hindering the economic growth. Unavailability of power (minimum 6 hours a day load-shedding) is affecting directly or indirectly on every sector of life.

In Pakistan, the most important aspect of well-being is also the most neglected. Pakistan's successive governments – civil and military – have not made health a priority. The overall public health scenario of Pakistan paints a miserable portrait. One child dies every minute due to vaccine-preventable diseases. The infant mortality rate is 66 per 1,000 births; the maternal mortality rate is 170 per 100,000. According to statistics, Pakistan had not been able to control the burden of communicable diseases. Pakistan is one of the three remaining countries where polio is still endemic and ranked fifth on the list of high-burden TB countries. However, we are number one in Men's T20 format of Cricket.

Aunty, Kensington Palace said in a statement, "Access to quality of education, particularly to girls and young women, is one of the UK's top priorities in Pakistan". Undoubtedly, education not only plays important role in building nation's character and makes people responsible citizens, but also considered most powerful instrument, to eradicate poverty and make better socio-economic progress. I am very

thankful to Kensington Palace for this concern. Unfortunately, Pakistan is suffering from an extensive education crisis. Millions of Pakistani children do not attend school, and those that do deal with absent teachers and poor learning environment. 63% of government schools are in a dangerous or dilapidated condition and lack basic facilities.

Our great Urdu poet Mirza Ghalib wrote more than a hundred year ago:

"If disgrace after death was to be my fate,
I should have met my end through drowning,
It would have spared me a funeral and no headstone would have marked my last resting place".

Unfortunately, United Nations Development Program (UNDP) recently released report on Human Development Index (HDI); Pakistan was at the 150th place, out of 189 countries. Similarly, Pakistan ranking was 105th on the indicator that measure how much credit a country gets for doing business. Disappointingly, in terms of Human Capital Index (HCI) launched by World Bank, Pakistan falls in the bottom rank due to the low GDP per Capita.

These are more bitter things, but there is a shortage of sugar as-well, or else I would have coated my words appropriately. Uncle, you may be thinking why I am telling you all this? Please grant me permission to answer your concern! We are poor because our country is poor. In our country, how we can spend on people or national development schemes when our money is robbed by the ruling elite? Pakistan is being plundered by corrupt elites and corruption and money laundering have become endemic in the country and its institutions. Here, I would like to draw your attention on Prime Minister of Pakistan Imran Khan's UNGA speech that focused on corruption and

money laundering. “Every year billions of dollars leave poor countries and go to rich countries. Billions of dollars siphoned by corrupt politicians to tax havens, expensive properties bought in western capitals. The rich countries must show political will; they cannot allow this flight of capital from poor countries through corruption”. The PM also called on developed counties to fight back against tax havens.

Uncle and Aunty, my country is poor, yours is rich and developed. I love my country and I also like your country. But, one thing that I do not like about your country, “UK has become a safe haven for corrupt capital stolen from around the world”, according to Transparency International (UK). The corrupt ruling elite must not be allowed to park dirty-money in your country. Uncle, I request you to help my country to retrieve the robbed money from people of Pakistan that is parked in the safe havens of Great Britain, so that we utilize it on development plans of our country and our citizens. I said this all because you are not only wiser, you are also my uncle.

Convey my good wishes to Prince George, Princess Charlotte and Prince Louis. If I have caused you offense, I beg your forgiveness. With the utmost respect! May you both have an amazing life together filled with endless laughter, far more joy than sorrow and a peaceful love.

Your nephew,

Mirza A.A. Baig

(On behalf of citizens of Islamic Republic of Pakistan)

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About Me:

I am CAS-TWAS President's Ph.D Fellow at Center for Biomedical Engineering, University of Science and Technology of China (USTC). A reader by day and a writer by night. I have been a Freelance Science Writer for the last eight years. I love reading, writing & sleeping! And, I am a thinker not talker…