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SANEM
Thinking Aloud

Editor's Desk

This December, 2018 issue of Thinking Aloud comes with the theme "Environment and Climate Change". The first article "The challenging economics of climate change" highlights the major challenges related to the study of economic costs and benefits of climate change, and the analysis of the economic impact of actions targeting at limiting its effects. The article argues that both the global and national political economy factors are critical in addressing climate change issues. The USA President Donald Trump's unfavorable attitude towards the warning of devastating effects from climate change, and eventually USA's withdrawal from the Paris climate agreement has created huge uncertainties for a global partnership. At the national level, many developing countries, due to their national priorities of industrialization and lobbying power of different quarters, find it extremely difficult to contain the polluting industries. Therefore, the developing countries have uphill tasks in the future given the aforementioned challenging economics of climate change. The second article titled "Some distinguished features of GBM Bangladesh delta: An analysis using the Input-Output Table" employs an environmentally extended input-output table (IOT) for the Bangladesh economy. The article advocates for safeguarding agricultural activities and protection of delta livelihood. Furthermore, since the delta region is a net importer of several environmental metrics, embodied in goods and services bought from other regions, compensatory fiscal measures should be undertaken to address the disproportionate burden of environmental metrics. The third page comprises of two articles. The article titled "Relooking at the Energy Dependence of South Asian Neighbors" is an attempt to observe the import directions of energy resources for three major South Asian economies in order to understand the level of risk associated with such dependence. The article titled "Climate Change and Energy Efficiency: From Nash Equilibrium Perspective" emphasizes that creating awareness regarding the worst possible scenario of climate change, promoting energy efficiency to reshape the demand side, clearing market barriers and making a clear path for technological innovation and diffusion can lead to better decision making strategies. The final page draws attention to the events that took place in the month of November.

Inside this issue

The challenging economics of climate change

Selim Raihan

Global climate change has become one of the dominant discourses in the scientific and public policy arena. Studies from scientific research show that the global warming is now a real phenomenon, as there has been an unusually rapid increase in Earth's average surface temperature over the past century primarily due to the unprecedented accumulation of carbon dioxide resulting from the burning of fossil fuels, together with emissions of other human-induced greenhouse gases. The effect of this temperature rise includes increased frequency of severe weather events (such as heat waves, hurricanes, and tornadoes), proliferated intensity of storms, and sea level rise. These changes, no doubt, pose serious threats to the welfare and existence of mankind and other living things on earth through impacting on the functioning of the ecosystem, biodiversity, and human health.

The economics of climate change refers to the study of the economic costs and benefits of climate change, and the analysis of the economic impact of actions targeting at limiting its effects. However, the economics of climate change is challenging due to the fact that there are huge uncertainties in the estimation of both the costs and benefits related to climate change. The precision of the time horizon, over which benefits and costs of climate change would accrue, is debatable. Also, there are uncertainties over thresholds for climate change impacts and the pace and form of technological innovation that can take shape in the future.

The 2018 Environmental Performance Index (EPI)

Top 10			Bottom 10		
Rank	Country	Index	Rank	Country	Index
1	Switzerland	87.42	180	Burundi	27.43
2	France	83.95	179	Bangladesh	29.56
3	Denmark	81.60	178	Dem. Rep. Congo	30.41
4	Malta	80.90	177	India	30.57
5	Sweden	80.51	176	Nepal	31.44
6	UK	79.89	175	Madagascar	33.73
7	Luxembourg	79.12	174	Haiti	33.74
8	Austria	78.97	173	Lesotho	33.78
9	Ireland	78.77	172	Niger	35.74
10	Finland	78.64	171	Cent. African Rep	36.42

Source: https://epi.envirocenter.yale.edu/

Furthermore, the effects of climate change are not uniform across countries. Different parts of the world are likely to be affected differently: countries closer to North and South poles will experience warmer temperatures and once inhospitable land will experience melting of ice. Small island nations are at risk of extinction due to rising sea levels. Low lying islands and countries are at a greater risk of flooding both from rising sea levels and increased precipitation. Countries near the equator are likely to experience unbearable heat. Some of the countries are already experiencing more frequent events of severe weather.

The economics of climate change is further complicated by the fact that most of the developing countries can't afford the costs of mitigation or adaptation of the aforementioned phenomenon of climate change. The 2018 Environmental Performance Index (EPI) of the Yale University ranks 180 countries on 24 performance indicators across ten issue categories covering environmental health and ecosystem vitality. These metrics provide a gauge at a national scale of how close countries are to establishing environmental policy goals. According to the EPI, most of the developing countries in the South dominate in the lower ranking. Among the bottom 10 countries in the ranking, three (Bangladesh, India and Nepal) are from South Asia. Bangladesh's position is 179 out these 180 countries.

There are also considerable debates in the discourse of climate change with respect to the policies and actions needed to address the challenges. Two instruments are widely referred in the policy discussion. The first one is the carbon tax, which is the mandatory fee charged for the emission of a given quantity of carbon dioxide or some other greenhouse gas. The second one is carbon trading, which is buying and selling of carbon credits, abstract instruments (like money) that each represents the right to emit 1 ton of carbon dioxide or an equivalent amount of other greenhouse gases. The other policies include technology promoting programs. One more instrument, which is less explored but can be effective, is the liberalization of trade in environmental goods (EGs), which can play a crucial role in protecting the environment as well as promoting international trade in EGs. Trade has a positive effect on the environment only if environmental policy advances alongside trade liberalization. However, most of the developing countries are seriously lagging behind in conceptualizing as well as in building national capacities to implement these aforementioned instruments.

One important challenge in the economics of climate change is the political economy aspect of it. Both the global and national political economy factors are critical in addressing climate change issues. The USA President Donald Trump's unfavorable attitude towards the warning of devastating effects from climate change, and eventually USA's withdrawal from the Paris climate agreement has created huge uncertainties for a global partnership. At the national level, many developing countries, due to their national priorities of industrialization and lobbying power of different quarters, find it extremely difficult to contain the polluting industries. Therefore, the developing countries have uphill tasks in the future given the aforementioned challenging economics of climate change.

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Volume 5 Issue 7 December 1, 2018

Some distinguished features of GBM Bangladesh delta: An analysis using the Input-Output Table

Zubayer Hossen, Bazlul Haque Khondker and Selim Raihan

The Ganges-Brahmaputra-Meghna (GBM) Basin spans across Bangladesh, Bhutan, Nepal, China and India, and presents one of the largest estuarine regions of the world - the Sundarbans delta. The delta area in Bangladesh comprises about 48 thousand square km. This article sheds light on some of the remarkable features of GBM Bangladesh delta. Those features have to do with the socio-economic and biophysical context, with their relations and interdependencies with the economy through the supply chain up to the final demand of goods and services in both the delta and non-delta regions. At the end, it comes up with some relevant policy measures based on the analysis.

This study employs an environmentally extended input-output table (IOT) for the Bangladesh economy. The IOT splits the economy into two parts: delta and non-delta. The delta part covers the coastal zone comprising 19 districts, and the non-delta part covers the rest of the country other than delta. This allows studying the interdependency between delta and non-delta parts of the country. The IOT for GBM Bangladesh delta has been developed based on the Bangladesh IOT 2012 prepared for the Seventh Five Year Plan under the aegis of Bangladesh Planning Commission. The Bangladesh delta IOT has 57 activities, and four types of factors – capital, labour (skilled and unskilled), natural resources and land. Various data sets namely, National Accounts Data, Household Income and Expenditure Survey data of 2010, and Labour Force Survey data of 2010 have been used to split national estimates into delta and non-delta regions.

Analysis of the IOT for GBM Bangladesh delta reveals some distinguished features of the delta region of the Bangladesh economy which make the delta region very different from the non-delta region. These features are discussed below.

The agriculture sector has a great importance in delta region, notably the fishing sector, which is relatively much bigger in the delta than in the rest of the country. Also, the construction, and the trade and transport activities -which quite often go unnoticed when highlighting important sectors of the deltas, such as small business trade, etc.- were revealed relatively more important in the delta than in the rest of the country (non-delta) (Figure 1).

The majority share of employment in agriculture, food, construction and services for delta region is demanded by the delta region itself. The fishing sector is another sector that has a sizeable share of employment demanded by the delta region itself (Figure 2).

The share of embodied (both direct and indirect) employment of women in the delta region is most present in agriculture. This is very different from what is observed in some other deltas in the world – Indian Bengal delta, Mahanadi delta and Volta delta. On the contrary, the share of embodied employment of women in the delta region is less present in services. For male counterpart, service sector has the highest share of embodied employment in the delta region (Figure 3).

The majority share of both the skilled and unskilled employment in delta region is demanded by the delta region itself. The similar kind of dominance is observed for non-delta region (Figure 4). In delta region, the predominance of unskilled work is embodied in the agriculture and forestry, services, construction and manufacturing and mining sectors. In both delta and non-delta regions, we can see the low share of skilled labour in the construction and agriculture and forestry sectors, whereas the service sector dominates with the highest percentage share of skilled labour (Figure 5).

The majority share of employment for both male and female in delta and non-delta regions is covered by their own respective labour forces. However, we also see migration of both male and female employees. Share of migrated workforces in total employment is higher for delta region compared to the non-delta region. In addition, migration is more notable for male workers (Figure 6).

The analysis on agricultural land use shows that although direct agricultural land use is clearly dominated by paddy rice, this changes enormously when we look at the embodied agricultural land in the final demand of goods and services. In particular, the embodied land use in vegetables, fruits and nuts are particularly relevant, mostly occurring to satisfy the final demand of the non-delta region. We also observe how sectors not directly using agricultural land the most, such as processed rice and food industry sectors, have notable embodied (directly and indirectly) agricultural land levels.

Due to reliance on agriculture and services activities, the delta region is a net importer of several environmental metrics, embodied in goods and services bought from other regions, but net exporter of energy and carbon dioxide emissions to the non-delta region.

Some features of GBM Bangladesh delta are quite diverse which may have different implications and call for more specific policy responses. Services (including construction) turn out to be important economic activities for delta region following agriculture. Industrial activity (including manufacturing and mining) appears less significant in terms of income and employment generation in delta. Thus, safeguarding agricultural activities should be a top priority in delta and appropriate adaptive and mitigating measures are needed. Another key observation is the self-sufficiency in employment generation in delta region. More than 60% of the delta employment has been used to satisfy the final demand needs of the delta area. Therefore, loss of livelihood in delta due to damage of natural resources and climate change may have deleterious impact on employment in delta region in particular and overall employment in general. For this reason, protecting delta livelihood should be a top policy priority. Furthermore, since the delta region is a net importer of several environmental metrics, embodied in goods and services bought from other regions, compensatory fiscal measures should be undertaken to address the disproportionate burden of environmental metrics.

This work was carried out as an outcome of Deltas, Vulnerability and Climate Change: Migration and Adaptation (DECCMA) project (IDRC 107642) under the CARIAA programme with financial support from DFID, UK and IDRC, Canada.

Zubayer Hossen, Dr. Bazlul Haque Khondker and Dr. Selim Raihan are Senior Research Associate, Chairman and Executive Director of SANEM respectively.

Figure 1: Distribution of value-added

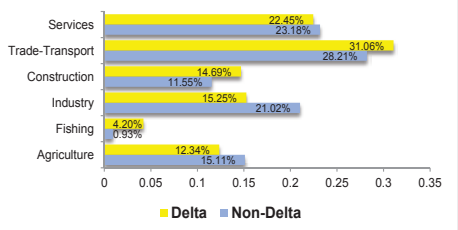


Figure 2: Employment (1000 people) by demanding region and sector

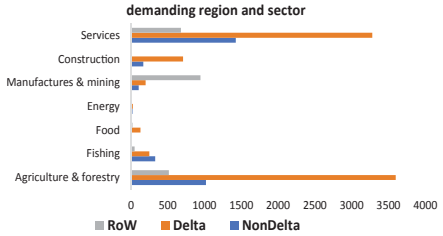


Figure 3: Employment by gender & sector

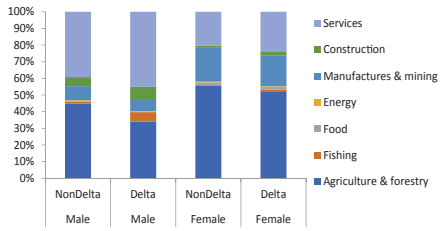


Figure 4: Skill categories of employment by demanding region

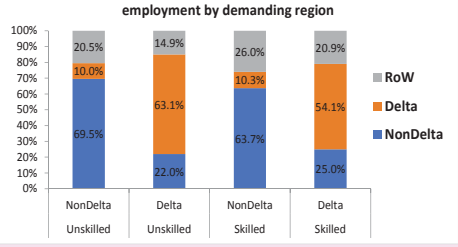


Figure 5: Employment by skill & sector in delta and non-delta

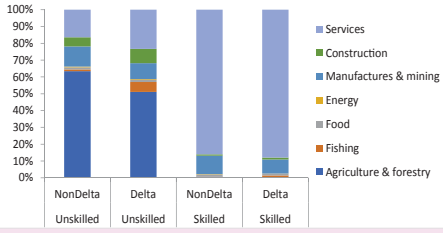
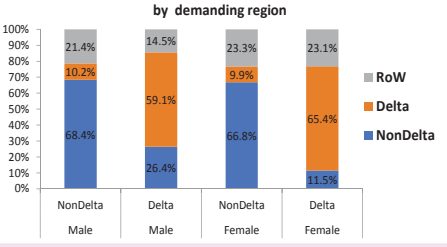


Figure 6: Gender of employment by demanding region



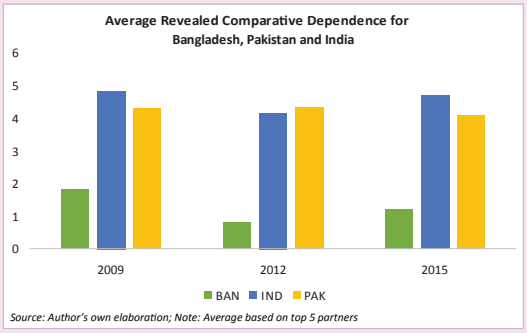
Featured Article

Volume 5 Issue 7 December 1, 2018

Relooking at the Energy Dependence of South Asian Neighbours

Suvajit Banerjee

For development to be sustainable, an uninterrupted flow of energy services is a precondition which requires a stable power equilibrium at both regional and global level. The services that energy provides are necessary and desirable, because of its essentiality for economic growth, and to improve the living standards of the population. Major South Asian economies with their long drawn colonial heritage and developing economic character rely on energy supplies mostly from outside the region in order to deliver their growth outcomes and achieve other developmental ambitions. However, the oil price shocks in the post-World-War-II phase starting from Suez Crisis of 1956-57, the OPEC Oil Embargo of 1973-74, the Iranian revolution of 1978-79, the Iran-Iraq War of 1980s, the Persian Gulf War of 1990-91, oil price spike of 2007-08, and drop in 2014-15 were few of the important external blows that these South Asian economies had to struggle with huge internal consequences. This article is an attempt to observe the import directions of energy resources for three major South Asian economies in order to understand the level of risk associated with such dependence. This study chose Bangladesh, India, and Pakistan because these three neighbours have a huge potential for intra-regional trade of less carbon emission intensive natural gas. However, the prospects of such trade are disputed with political arguments and counter-arguments beyond the scope of energy economics considerations.



Source: Author's own elaboration; Note: Average based on top 5 partners

Bangladesh, India, and Pakistan were compared based on the flow of import values as a proportion of total imports for three years 2009, 2012 and 2015 in terms of their top 20 import relationships. A common feature was observed for all three South Asian neighbours, only for a few relationships there are high import values and for most of the other relationships imports are lower. Therefore, the distribution of import values is much skewed across the importing partners. This phenomenon is extreme in the case of Pakistan, followed by Bangladesh and India. For Pakistan, the top three import partners dominating the entire fuel import of the nation are UAE, Saudi Arabia, and Kuwait. During 2009 to 2015 the top 5 import partners of Pakistan contributed around 89 percent of the entire fuel import. The import dependence for energy resources of Bangladesh shows a similar pattern to Pakistan. Bangladesh is found having strong fuel import relationships with Singapore, Kuwait, Malaysia and UAE with the ranks of these import partners changing within the top 4 positions. In terms of the dependence on top 5 import partners Bangladesh is marginally less dependent than Pakistan. However, in terms of top 10 import relationships Pakistan's external dependence is slightly lower than Bangladesh. In case of India, the top 10 fuel import relationships are moderately high. This indicates that India meets its demand for energy resources from diversified import source points. Important fuel import sources of India are found located in various geographical spaces, from the Middle East, West Africa and Latin America which has helped reduce India's risk of sudden supply shock of energy resources. Therefore, among Bangladesh, India and Pakistan India's dependence on fuel import is more equally distributed. In terms of the Skewness as well on the distribution of average import values from top 50 import partners for the years 2009, 2012 and 2015, Pakistan scored the highest (4.47), followed by Bangladesh (4.39) and India (2.35). All three distributions are found leptokurtic with a maximum peak for Pakistan and a minimum for India.

This study proceeds further by using an index much similar to the concept of 'Revealed Comparative Advantage (RCA)' constructed by Bela Balassa and Mark Noland (1965). This index is shown below as equation (1) and understood as 'revealed comparative fuel import dependence index (RCFMDI)'.

RCFMDI = (Mis / Mit) / (Mws / Mwt) (1)

where Mis and Mws are the country-i's fuel import and world's fuel import from a source country 's' respectively. On the other hand, Mit and Mwt denoting country-i's and the world's total imports respectively. Therefore, RCFMDI, as indicated in equation (1), reveals the import dependence of any country 'i' on a source country 's' for fuels in comparison to total imports as a proportion of total imports of the source country in comparison to total world import. Similar to RCA, a value of RCFMDI more than 1 reveals the comparative dependence of country-i and a value less than 1 reveals a non-dependence.

This study calculated the RCFMDI values of Bangladesh, India, and Pakistan for the years 2009, 2012 and 2015 in terms of their top five import partners. The figure shows the average of these index values. To arrive at a more consistent average score for each South Asian countries and for all three years this study used the geometric mean of the index values with corresponding top five import partners. The figure shows Bangladesh's average fuel dependence reduced remarkably in 2012 and again experienced a minor increase in 2015. For India and Pakistan, the dependence has been quite noticeable in all three years and India's average dependence has been slightly higher than Pakistan's for 2009 and 2015. Therefore, even though India has a geographically diversified fuel import source points, however in terms its revealed comparative average with five top importing partners the dependence for energy resources is higher than its closest neighbors. This study in a way provokes further agendas on how these three countries could engage in mutually benefiting intra-regional energy trade in order to eliminate heavy inter-regional dependence. Various cross-country natural gas pipeline network proposals are at various levels of negotiation stages have the possibilities to connect these South Asian neighbors together and with other Asian countries, like – Kazakhstan, Iran, and Myanmar. This study is an initiative to introduce a much larger research question on how to bring an optimal energy demand and supply equilibrium at a regional level in South Asia.

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Climate Change and Energy Efficiency: From Nash Equilibrium Perspective

Farhan Khan

One of the root factors for climate change is the high rate of exploitation of energy (fossil fuels) to stimulate economic growth which indirectly causes environmental degradation. To reduce high rate of exploitation, energy efficiency is usually considered as a recommended solution by the experts perhaps because of its tangibility and accessibility. In simple, energy efficiency refers to the fact where same amount of output can be produced by consuming relatively less amount of particular energy source. By doing this, two important outcomes can be attained. Firstly, reduced amount of GHG gas emission and secondly, ensuring sustainable social welfare for tomorrow.

The significance of initiating energy efficiency can be showed by setting up a simple game where cooperation between stakeholders (players) can lead to long run prosperity. The table illustrates outcome of a simple finite game where government and other stakeholders are the two groups of players. If both players are cooperative and given the chance to analyze others move, then the game will end with a perfect 'Nash Equilibrium' or the optimal outcome by incorporating energy efficiency program will be achieved. When both players agree on the efficiency of energy usage, they have to incur a certain amount of startup (minimum technical cost) cost (C') but the damage cost (T*) (for example, cost of rise in temperature) will be minimum or zero and there will be a social welfare (S) gain in the long run which is the result of former pay offs. If one player steps forward for energy efficiency while other player shows reluctance, then damage will increase to a certain degree (T**). In contrast, if both of the players refuse the energy efficiency program then the damage cost will be even more dangerous (T***) and the social welfare in the long run will be completely ruled out due to negative effects of climate change. It is clear from the game that when there is a cooperation between players only then there will be a win-win situation.

Cooperative Game on Climate Change and Energy Efficiency

		Player 2	
		Agree	Disagree
Player 1	Agree	(C'+T*+S)	(C'+T**+s)
		(C'+T*+S)	(T**)
	Disagree	(T**)	(T***)
		(C'+T**+s)	(T***)

T*<T**<T***; S>s

Although from the above game, cooperation can lead to desirable outcome to tackle climate change but reaching to the equilibrium is difficult because of hesitations or myopic self-interest (ignoring long run externalities for short run profits or benefits) while making the decision which is associated with uncertainty. Some of the well-known reasons of uncertainty are asymmetry of information, inadequate technology, moral hazard and lack of commitment towards society. All of these can lead to wrong choice of strategy given the strategy of the other player. Therefore, creating awareness regarding the worst possible scenario of climate change, promoting energy efficiency to reshape the demand side, clearing market barriers and making a clear path for technological innovation and diffusion can lead to better decision making strategies. Hence, a successful energy efficiency program can be implemented for preventing climate change.

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Featured Article

Volume 5 Issue 7 December 1, 2018

Dr. Raihan participated in panel discussion at BLLISS GALA DINNER 2018

Dr. Selim Raihan, Executive Director at the South Asian Network on Economic Modeling (SANEM) and Professor of Economics at the University of Dhaka attended a panel discussion on "Automation and the factory of the future" at the Bangladesh Leather footwear and Leather goods International Sourcing Show (BLLISS) 2018 dinner hosted by Apex Footwear Limited. The primary focus of the session was on how automation can lead to job displacement and possible erosion of advantage for Bangladesh. The event took place at The Westin Dhaka on November 23, 2018.

SANEM Executive Director participated roundtable on BRI in Sri Lanka

Dr. Selim Raihan, Executive Director at South Asian Network on Economic Modeling (SANEM), took part in a roundtable discussion titled "Chinese Outbound Investment and the Belt and Road Initiative (BRI) in Sri Lanka." The event was jointly organized by Chatham House and the Lakshman Kadirgamar Institute of International Relations and Strategic Studies (LKI) in Colombo, Sri Lanka on November 1, 2018. The primary intentions behind arranging the roundtable – which was a part of a wider project examining Chinese investment and the BRI in Sri Lanka – were to have a better understanding on the impact of these investments, establish what can be learnt from recent experience, and formulate recommendations to inform future implementation of the BRI and other Chinese investments—both in Sri Lanka and other host countries. On November 2, 2018, Dr. Raihan paid a call to Colombo International Container Terminal at Colombo Port (operated by China Merchants Port Company in Sri Lanka) as a part of his visit.

Dr. Selim Raihan spoke at the BIDS Research Almanac 2018

SANEM Executive Director Dr. Selim Raihan participated as a panel discussant during the 3rd technical session of the BIDS Research Almanac 2018 hosted by Bangladesh Institute of Development Studies (BIDS) at Hotel Lakeshore in Gulshan, Dhaka on November 11-12, 2018. The two day-long event included several paper presentation sessions by BIDS scholars on various issues under five broad themes – Agriculture and Employment, SME Productivity, Financing and Women Entrepreneurs, Quality of Growth and Human Development, Urbanization, Disaster Vulnerability and Social Safety Nets and Energy Use, Migration and Household Welfare. Three papers primarily focused on Quality of Growth and Human Development were presented during the 3rd technical session. The event was chaired by BIDS Director General Dr. KAS Murshid while the Economic Affairs Adviser to the Hon'ble Prime Minister Dr. Mashiur Rahman was present as the Chief Guest.

Dr. Selim Raihan participated in CPD's Research-Policy Meeting on SDGs for South Asia

Dr. Selim Raihan, professor of Economics at the University of Dhaka and Executive Director at the South Asian Network on Economic Modeling (SANEM), attended the opening plenary and working session of a Research-Policy Meeting titled "Interpreting SDGs for South Asia: In Search of a Regional Framework" as a panelist. The event was organized by the Centre for policy Dialogue (CPD), in partnership with UN-ESCAP South and South-West Asia Office, New Delhi and Friedrich Ebert Stiftung (FES), Bangladesh Office. The event was held at the Hotel Golden Tulip, Banani, Dhaka. International Affairs Advisor to the Hon'ble Prime Minister of Bangladesh Dr. Gowher Rizvi was present at the event as the chief guest while Secretary of the Ministry of Foreign Affairs Mr. Md Shahidul Haque was present as the special guest.

SANEM Executive Director participated in international conference in Nepal

Dr. Selim Raihan, professor of Economics at the University of Dhaka and the Executive Director at South Asian Network on Economic Modeling (SANEM) participated in the Third International Conference on "China's Belt and Road Initiative in South Asia and Nepal: Trade, Investment, and Connectivity Dynamics" organized by Nepal-China Friendship Forum in Gairidhara, Kathmandu, Nepal from 18-19 November, 2018. He presented a paper on the second day of the conference in the session entitled "South Asia and China: Trade, connectivity, and investment". The session was chaired by Dr. Posh Raj Pandey, Chairman, South Asia Watch on Trade, Economics and Environment, Nepal. The two-day conference was organized aiming to enhance knowledge, interaction and network for greater understanding of the BRI initiative among policymakers, researchers and businesses in the SAARC region.

Dr. Selim Raihan attended BLLISS 2018

SANEM Executive Director Dr. Selim Raihan took part in the 2nd edition of BLLISS 2018 (Bangladesh Leatherfootwear & Leathergoods International Sourcing Show). The program was organized by Leathergoods and Footwear Manufacturers & Exporters Association of Bangladesh (LFMEAB) at the International Convention City Bashundhara (ICCB) in Dhaka on November 22-24, 2018. The event was inaugurated by Sheikh Hasina, Hon'ble Prime Minister of Bangladesh. Dr. Raihan participated as a panel discussant of the session titled "Opportunities for Bangladesh arising from US-China tariff war"on the opening day of the event.

e-version: http://sanemnet.org/thinking-aloud/

Events

SANEM
RESEARCH | KNOWLEDGE | DEVELOPMENT

SANEM is a non-profit research organization registered with the Registrar of Joint Stock Companies and Firms in Bangladesh. Launched in January 2007 in Dhaka, it is a network of economists and policy makers in South Asia with a special emphasis on economic modeling. The organization seeks to produce objective, high quality, country- and South Asian region-specific policy and thematic research. SANEM contributes in governments' policy-making by providing research supports both at individual and organizational capacities. SANEM has maintained strong research collaboration with global, regional and local think-tanks, research and development organizations, universities and individual researchers.

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