A South Asia Study on Collaborative Action towards Societal Challenges through Awareness, Development and Education (CASCADE)

Dr. Rishiraj Dutta[*1], Dr. Habibur Rahman[2], Dr. Senaka Basnayake[1], Mr. Anisur Rahman[1], Mr. Khondoker Golam Tawhid[1], Yogesh Gyawali[3], Irfan Ahmad Rana[3]

[1]Asian Disaster Preparedness Center, Thailand
[2]Deakin University, Melbourne, Australia
[3]Asian Institute of Technology, Thailand

[*]Corresponding author: Dr. Rishiraj Dutta
Email: rishiraj@adpc.net

Abstract

CASCADE is a project under the European Community's Programme for International Cooperation within their 7th Framework Programme for Research and Technological Development (2007-2013). The aim of this project is to provide the foundation for a future INCONET programme targeting South Asian Countries and which will promote bi-regional coordination of Science and Technology (S&T) cooperation, including priority setting and definition of S&T cooperation policies. The project was implemented in seven South Asian countries namely Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka with the work being focused on seven thematic societal challenges identified under EU's *Horizon2020* research programme: Health, demographic change and well-being; Food security, sustainable agricultures, marine and maritime research and the bio-based economy; Clean and efficient energy; Smart, green and integrated transport; Climate action, resource efficiency and raw materials; A changing world-inclusive, innovative and reflective societies; and, Secure societies-protecting freedom and security of the country and its citizens. This paper gives an overall understanding of the project as well as some of its significant outcomes that it has achieved during the project implementation stage.

I. Introduction to Horizon2020 and Societal Challenges under CASCADE

Horizon2020 is a financial programme of the European Union (EU) for research and innovation, and acts as the successor to the Framework Programme 7 (FP7) that will run for the period between 2014 and 2020. The main objective of this programme is to contribute to the objectives of Europe 2020 strategy along with the completion of the European Research Area. The entire programme has five specific objectives:

- Strengthen Europe's science base by improving its performance in frontier research, stimulating future and emerging technologies, encouraging cross-border training and career development, and supporting research infrastructures;
- Boost Europe's industrial leadership and competitiveness through stimulating leadership in enabling and industrial technologies, improving access to risk finance, and stimulating innovation in SMEs;
- Increase the contribution of research and innovation to the resolution of key societal challenges;
- Provide customer-driven scientific and technical support to Union policies;
- Help to better integrate the knowledge triangle – research, researcher training and innovation.

Horizon2020 also aims to tackle societal challenges by bridging the gap between research and the market. The focus of the research is on societal challenges faced by the EU society. Under this program, seven key societal challenges have been identified which include:

Challenge 1 – Health, demographic change and well-being
Challenge 2 – Food security, sustainable agriculture, marine and maritime research and the bio-based Economy
Challenge 3 – Secure, clean and efficient energy
Challenge 4 – Smart, green and integrated transport
Challenge 5 – Climate action, resource efficiency and raw materials
Challenge 6 – Europe in a changing world – Inclusive, innovative and reflective societies
Challenge 7 – Secure societies – Protecting freedom and security of Europe and its citizens

Challenge 1 – Health, Demographic Change and Well-being

Under this challenge, three underlying themes are covered: child health, health of aging population and gender related health. Research mostly involved:

- Prevention through increasing understanding of relationships in all areas that relate to health: including genetic; environmental; social and economic factors, and ensuring a healthy approach to aging;
- Disease to understand the development processes and process of disease and its spread, in order to stimulate innovative drugs and therapies, and methods of treatment;
- Health and social care to improve the sustainability and efficiency of care provision, whilst considering the individuals requirements and responses. It is also expected that this area

will look at the management and effects of emerging health threats, for example epidemics.

Challenge 2 – Food Security, Sustainable Agricultures, Marine and Maritime Research and the Bio-based Economy

This challenge is divided into four categories:

- Sustainable agriculture and forestry that includes increasing the production efficiency and coping with climate change, while ensuring sustainability and resilience;
- Sustainable and competitive agri-food sector for a safe and healthy diet that includes achieving food safety and security for all Europeans;
- Unlocking the potential of aquatic living resources for sustainable non-food products and processes;
- Sustainable and competitive bio-based industries for sustainable primary production, mitigation and adaptation to climate change as well as low carbon and resource efficient industry.

Challenge 3 – Secure, clean and efficient energy

The specific objective of this challenge is *to make the transition to a reliable, sustainable and competitive energy system, in the face of increasingly scarce resources, increasing energy needs and climate change.*

Challenge 4 – Smart, green and integrated transport

The main purpose of this challenge is *to achieve a resource efficient environment friendly, safe, seamless and performing transport system for the benefit of all citizens, the economy and the society.* The challenge mostly looks into criteria such as resource efficient transport that respects the environment; better mobility, less congestion, more safety and security; global leadership for the European transport industry; socio-economic and behavioral research and forward looking activities for policy making.

Challenge 5 – Climate action, resource efficiency and raw materials

The aim of this challenge is *to achieve a resource efficient and climate change resilient economy and a sustainable supply of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources.* It also aims at developing comprehensive and sustained global environmental observation and information systems identified as a broad line of activity under this challenge. The main focus areas include:

- Waste: a resource to recycle, reuse and recover raw materials
- Water innovation: boosting its value for Europe
- Disaster resilience: safeguarding and securing society, including adapting to climate change

Most activities associated with each challenge will contribute to increasing the efficiency of Europe and Asia in assuring environmental integrity, and sustainability, and enabling ecosystems and society to adapt to the changing climate.

Challenge 6 – Europe in a changing world – Inclusive, innovative and reflective societies

This challenge tried to achieve inclusive and innovative European and Asian societies in the context of unprecedented transformations and growing global interdependencies. The areas that it covers include: inclusive societies, innovative societies and reflective societies.

Challenge 7 – Secure societies – protecting freedom and security of Europe and its citizens

The main aim of this challenge is to foster secure societies in Europe and Asia in the context of unprecedented transformations and growing global interdependencies and threats, while strengthening the European and Asian culture of freedom and justice. The main research under this theme includes preventing, deterring, preparing and protecting against security threats, and supporting common foreign and security policy and security strategy including policies on disaster prevention and response.

II. ADPC's Contribution to CASCADE

ADPC was nominated as the Work Package (WP) Leader for Work Package (WP) 2 to work simultaneously with the Project Coordinator and Steering Committee in accordance with the project quality plan. The main task for ADPC under this work package was to facilitate in the thematic dialogue workshop on mutual EU-Southern Asian research priorities setting, attended by all South Asia and European partners. The center also assisted in the preparation of the Bangladesh National Position Paper as well as with compiling a Regional Position Paper that identifies global challenges and research priorities relevant to the South Asian region. One main task was to conduct country level assessments on the seven societal challenges for the seven countries namely Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka using secondary data sources. As a result, an extensive study on the societal challenges through interviews and focus group discussions was also conducted in Bangladesh for the National Position Paper.

III. Methodology Followed

The entire study was based on interviews and focus group discussions conducted in each of the seven countries for each challenge identified under the CASCADE program, and was conducted in two phases. The first phase included a detailed policy analysis as well as country level assessment of societal challenges using secondary data sources. The second phase involved a combination of semi-structured interviews and focus groups. 348 interviews were conducted across the seven countries, and a further 139 respondents participated in sixteen focus groups (Haigh et al., 2015). Throughout the process of data collection and assessment, standard protocols and templates were used including proper briefing of the partners.

IV. Results and Discussions

The two most significant outcomes of this project are the Bangladesh National Position Paper (ADPC and PSTU, 2015) and the South Asia Regional Position Paper (Haigh et al., 2015).

Priorities Observed from the Bangladesh National Position Paper

Challenge 1: Health, demographic change and wellbeing

- Increased investment in health infrastructure (e.g., hospitals, clinics and medical instruments) for enhancing medical service coverage especially in the rural areas;
- Support the immunization program for protection of infants from diseases;
- Raise advocacy and awareness on healthcare preventative programs highlighting maternal healthcare and prevention of HIV & Tuberculosis (TB) through community-based (including religious and community leaders) education, training and the use of print and electronic media.

Challenge 2: Food security, sustainable agricultures, marine and maritime research and the bio-based economy

- Implementation of national policy is necessary which requires increasing the budget, improving agriculture and livestock governance, developing human resources and ensuring delivery of services at grass-roots level;
- Need for a strong governance system to stop illegal food hoarding businesses;
- The farmers should be able to obtain credits with more flexible conditions;
- Awareness and training programs are needed to make farmers apprised of agricultural sustainability and food self-sufficiency;
- Inspiring farmers about agricultural insurance is another vital issue to address;
- Promoting the use of high yielding varieties (HYV);
- Further strengthening the agricultural sector to ensure food security.

Challenge 3: Clean and efficient energy

- Increase investment in the energy sector for generating more electricity and improving transmission infrastructure;
- An appropriate surveillance system needed to minimize electricity system loss;
- Special emphasis should be given to the renewable energy sources to avoid fuel crisis;
- A specialized energy program needed to serve marginalized groups;

Challenge 4: Smart, green and integrated transport

- Strengthening the efficiency of the transport system;
- A better traffic control system, fuel free technology, solar and bio energy, and the inclusion of battery operated vehicles should be considered as alternatives;
- Transport infrastructure programs be given importance;

- Private transport to be replaced by public transport;
- Improving the water transportation infrastructure.

Challenge 5: Climate action, resource efficiency and raw materials

- Comprehensive climate change adaptation initiative is the need of the hour for Bangladesh;
- Comprehensive climate change adaptation plan to safeguard agricultural sector;
- Resettlement plans for residents living near the coastal belt;
- Research on estimating the loss and damage due to climate change is needed.

Challenge 6: A changing world: inclusive, innovative and reflective societies

- Government should develop a plan for reducing poverty, redistribution and proper utilization of resources, skilled man power development, facilitating leadership practice, increasing innovation and social entrepreneurship;
- For improving accountability and transparency in social institutions, people need to engage in social networks in their daily life;
- Government incentives to generate more social capital to have a more inclusive, innovative and reflective society.

Challenge 7: Secure societies: protecting freedom and security of the country and its citizens

- Monitoring efforts through policies, proper implementation, maintenance and coordination among the government and other relevant agencies;
- Strengthening counter trafficking committees in districts, *upazila*/sub-districts and union levels to stop human-trafficking;
- Tightening the border security so that international terrorist agencies cannot use the land of Bangladesh;
- Promoting gender equality, women empowerment, legal protection through panels to ensure women and children are secure;
- Developing and strengthening the disaster risk management framework to secure resilient societies and ensure environmental security.

Outcomes of the Bangladesh National Position Paper

Challenge 1: Health, demographic change and wellbeing

It is found that the unavailability of health services, poverty and awareness, malnutrition, women friendly health services and health equity, drug abuse, adolescent female health, and maternal health support are critical issues in the health sector of Bangladesh. Poverty and a lack of awareness also play a vital role because most of the people in the country are poor and not aware about their health status, especially maternal and child healthcare and this is creating a threat to reducing the mortality rate among mothers and children. This is compounded by the fact that for various religious and social reasons, women and girls are often not permitted to go a far distance to obtain health facilities. So ensuring women friendly health services and equity are also critical

issues. In the urban areas of Bangladesh, the youth and teens are the victims of drug abuse because of the easy availability of drugs. All the above mentioned issues are affecting the community in terms of scarcity of health services, property and awareness, resulting in unstable health conditions.

Recommendations

- Bangladesh believes that a health assessment up to community level will be fruitful to identify the issues and challenges;
- To increase investment in health infrastructure (e.g., hospitals, clinics and medical instruments), especially in the rural areas;
- To support the immunization program to protect infants from diseases;
- To increase awareness through various programs, proper education, gender equity, minimize environmental pollution, increase humanitarian activities, capacity building and overall formation of a bottom up approach and community involvement are all needed to understand the demands and problems.

Challenge 2: Food security, sustainable agricultures, marine and maritime research and the bio-based economy

From the perspective of Bangladesh, food security, sustainable agriculture, marine and maritime resources, and bio-based economy are very important sectors. The study observes that deficiency of food production, imbalance of food types, low food quality, weak governance and price increases, unawareness about balanced diets, agricultural production and bio-economy, demand from a burdened population, changes in climate variability, changes in water availability, flooding and riverbank erosion, reduced fish species, and conventional methods of aquaculture are the major problems. Another critical issue is the increasing population with diminishing cultivable land. Non-participatory planning approaches, loss of crop production, loss of employment, climate change and unstable agricultural production, increased social and economic vulnerability of the community, land loss, political conflict, not getting the proper benefit from cultivation, and diversification of farmers to other jobs are other important factors.

Food security is an alarming issue in Bangladesh. The northern part of the country is drier than the southern part and for cultivation, smooth and sufficient irrigation processes are required which is a limitation at present. As a disaster prone area, floods, cyclones, and tornados are accountable for the loss of crop production and this pushes people towards an unstable food balance. Climate change is another threat to food security, basically for the arid northern part. The rapid urbanization drives the farmers into other jobs for more benefit and reduces the manpower in this sector.

Recommendations

- It is necessary to implement a national policy that requires an increased budget, to improve agriculture and livestock governance, develop human resources and ensure services delivery at grass-roots level;
- The country needs a strong governance system to stop illegal food stocks as well as more investment in the food sector generally;

- The country should be able to provide an easy loan system with low interest rates to encourage farmers to cultivate;
- Awareness and training programs are needed to make farmers aware of scientific cultivation, agro forestry, bio economy and other agricultural related sectors;
- Cultivating early maturing and HYV (high yielding variety) is recommended to reduce crop damage due to floods and other related issues.

Challenge 3: Clean and efficient energy

The country lacks energy supply compared to demand. Insufficient budgets, lack of alternative fuels, lack of awareness of adequate energy supplies, efficient energy use, and energy transmission problems are the major issues in this sector. Energy transmission problems are another major problem because around 4.5 billion kilowatts of electricity are lost during the distribution across Bangladesh.

Recommendations

- Increase investment in the energy sector for generating more electricity and improving the transmission infrastructure;
- Requirement of an appropriate surveillance system for minimizing electric system loss;
- Special emphasis should be given to renewable energy sources that can trickle down to address the fuel crisis in the long run;
- A special energy program needs to be taken to serve marginalized groups such as people living in the hill tracks and coastal areas of Bangladesh.

Challenge 4: Smart, green and integrated transport

In Bangladesh, an unplanned city and traffic system is in evidence, FF (fuel free vehicles) are absent, ITS (intellectual traffic system) is also absent, while there is a lack of integrated feedback, potentialities of the roads, lack of awareness, rules and regulations relating to the traffic system, land use planning and parking system problems, disorganized traffic and road networking systems are all problems of a serious nature. Among the above problems, the disorganized traffic control and road networking system, lack of a multiple transport system, parking system problems, unplanned VIP transport, political and social crowds on the road are the most critical issues in the city life of Bangladesh.

Recommendations

- Better traffic control system, fuel free technology, solar and bio energy, and inclusion of battery operated vehicles could solve the problems identified above;
- Prioritizing a strategy for ensuring the maximum efficiency in using the existing transport network facilities;
- Transport infrastructure programs such as construction of new roads, freeways, road extensions, and bridges needs to be expedited to meet the challenges of an increasing population;

- Computerized vehicle security systems should be introduced to avoid delays at security checkpoints in the urban centers, commercial roads, and educational institution roads;
- Improving the water transportation infrastructure.

Challenge 5: Climate action, resource efficiency and raw materials

Changing human behavior and land use, the skewed distribution of resources and the high density of people (over 1100 persons/km) both combine with an increase in climate change, environmental degradation, raising urban disaster and health risk, global warming associated with natural disasters in arid areas, droughts, extreme temperatures in summer and cold waves in winter, salinity intrusion, deforestation, seasonal variation, indiscriminate waste and effluent disposal, and finally biodiversity loss are considered some of the major problems in Bangladesh. Production loss, climate induced displacement, diseases, agricultural dependency, no diver's income source, inadequate development, weak government mechanisms relevant to CCA and DRR, lack of awareness about climate change, loss of cultural knowledge are the most critical issues in this challenge. Climate change has an impact on culture, tradition and overall livelihood throughout Bangladesh. River bank erosion, floods, and droughts are accountable for the suffering of farmers and fishermen and their migration.

Recommendations

- Bangladesh demands a comprehensive climate change adaptation initiative, which may include appropriate land-use planning, conservation biodiversity, community empowerment, and on the whole, the prioritization on investing in innovative, adaptive and absorptive capacity building activities;
- Bangladesh should formulate a comprehensive climate change adaptation plan to safeguard its primary sector;
- Conduct research on developing method in estimating the loss and damage due to climate change;
- Resettlement plans that can be implemented whenever required need to be formulated for vulnerable residents.

Challenge 6: A changing world: inclusive, innovative and reflective societies

The imbalanced distribution of resources is creating a significant population of marginal poor. The unplanned development of technologies is generating social risk such as rapid urbanization without a plan. Illiteracy, unemployment, and poverty are the common problems. The rapid urbanization without a plan is one of the most critical issues as it is destroying the biodiversity and environmental balance. Because of unequal development and resource distribution, the poor, marginal, and middle class people all over the country are affected.

Recommendations

- The government should develop a plan for reducing poverty, for better redistribution and proper utilization of resources, skilled man power development, facilitating leadership practice, increasing innovation and social entrepreneurship;

- For improving accountability and transparency in social institutions, people need to engage in social networks in their daily life;
- For successful social inclusion, people must have rights to act and claim in terms of a) rights to be different, b) legal rights, c) rights to access social services, such as housing, education, transportation, and d) health care resources to fully participate in all aspects of societal activities.

Challenge 7: Secure societies: protecting freedom and security of the country and its citizens

With a lack of available data on crime, illegal trafficking and terrorism, border management, and cybercrime, there is not enough to bring about a realization in the current situation of Bangladesh. Refugees, border insecurity, cyber insecurity, crime and terrorism, and natural disasters should be identified as problems in this challenge. The communication and transport system has been hampered due to the conflict situation as well as the price increase of the necessary commodities.

Recommendations

- Monitoring efforts through policies, proper implementation, maintenance and coordination among the government and other relevant agencies;
- Tightening the border security is important;
- Promoting gender equality, women's empowerment, legal protection through panels to ensure security for women and children;
- Developing and strengthening the disaster risk management framework to secure resilient societies and ensure environmental security.

Outcomes from the South Asia Regional Position Paper

Challenge 1: Health, demographic change and wellbeing

Poor health indicators: Low life expectancy and high rates of malnutrition, infant mortality, and incidence of tuberculosis and HIV/AIDS, as well as wide spread malaria are some of the major health challenges observed in South Asia. Exchange of science and technology in the health sector is considered a key area of mutual collaboration.

Challenge 2: Food security, sustainable agricultures, marine and maritime research and the bio-based economy

The health and well-being of the world's growing population are largely dependent on the ability of the agricultural industry to raise high yielding and climate resistant food crops. Enhancing the productivity of resources held by smallholder family farmers, fishing and forest communities, and promoting their rural economic integration through well-functioning markets, are also essential elements of inclusive growth. Improving the quality of life of farmers and fishermen will be important to sustain agriculture and to redress the rural to urban migration.

Challenge 3: Clean and efficient energy

South Asia has great potential for energy efficiency and renewable energy, including hydro, geothermal, wind, solar and tidal energy. Innovative finance mechanisms and policies are needed to reduce the risks perceived by mainstream lending institutions in cleaner technology investments and to enhance their capacity to finance low carbon technologies and resource options. South Asian countries need enhanced regional energy transfer to leverage economies of scale through a more vibrant intra and inter regional energy trade structure.

Challenge 4: Smart, green and integrated transport

With limited financial capacity to expand transport infrastructure, intelligent use of existing capacity will be vital to support growth. Effective integration of the transport system in South Asia could also contribute greatly in enhancing access to remote areas, thereby extending economic development. Establishing the missing safety regulations, supported by strict enforcement and policing is also very important.

Challenge 5: Climate action, resource efficiency and raw materials

This may include appropriate land-use planning, conservation and biodiversity, community empowerment, and investing in innovative, adaptive and absorptive capacity building activities. Resilience building measures must also be inclusive. Countries need to look at better management of resources and services.

Challenge 6: A changing world: inclusive, innovative and reflective societies

Good governance depends on the ability to exercise power, and to make good decisions over time, across a spectrum of economic, social, environmental and other areas. This is linked with the government's capacity for knowledge, mediation, resource allocation, implementation and maintenance of key relationships. Participation of women and youth, consideration of the vulnerable, internationalization, and issues of employment are also important. Improving the existing educational system is another critical area being observed.

Challenge 7: Secure societies: protecting freedom and security of the country and its citizens

In accordance with the new Sendai Framework (2015 – 2030), there is a need for South Asia to 'prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience'. Priorities include a shift from disaster loss to disaster risk, and from disaster management to disaster risk management. A focus on a people-centered preventive approach to risk reduction will be vital, as will defining the primary responsibility of States for risk reduction, but also shared responsibility with stakeholders.

V. Final Conclusion on CASCADE Project

The major findings from the CASCADE project were presented at an open briefing event at the UK Research Office in Brussels. The event, held on 9th March, was attended by over 25 representatives from the EU and South Asian government officers and partners working in the region. The CASCADE regional position paper has been published which draws together the findings from the seven national position papers developed by the South Asian partners, and which identifies global the challenges and research priorities of mutual interest to the EU and South Asia. The paper directly addresses the seven societal challenges addressed by *Horizon2020* through the findings of the seven national position papers. The CASCADE team also mapped and developed an inventory of national and regional stakeholders related to global challenges in addition to raising awareness on research and innovation priorities for fostering cooperation and towards building mutual understanding on how to address common global societal challenges.

VI. Future Scope for ADPC to Work with the European Union

There are many future opportunities for ADPC to work with European Union. One of the key areas that ADPC has tremendous scope in, is the EU's Disaster Resilience programme on safe guarding and securing society, including adapting to climate change.

Acknowledgement

References

Haigh, R., Amaratunga, D., Liyanage, C., Ginige, K., Arambepola, N., Dutta, R. (2015). South Asian Regional Position Paper on Horizon 2020 Societal Challenges. *CASCADE Project No. 609562*; European Community's Programme for International Cooperation under the 7th Framework Programme for Research and Technological Development (2007 – 2013).

Horizon 2020 – The EU Framework Programme for Research and Innovation. *The research has received funding from the European Union's Seventh Framework Programme (FP7/2007 – 2013) under grant agreement no. 609562.*

National Position Paper on Horizon 2020 Societal Challenges: Bangladesh, (2015). Asian Disaster Preparedness Center, Thailand and Patuakhali Science & Technology University, Bangladesh. *CASCADE Project No. 609562*; European Community's Programme for International Cooperation under the 7th Framework Programme for Research and Technological Development (2007 – 2013).

Promoting EU and South Asian Bi-Regional Coordination of Science and Technology Cooperation. Newsletter, Issue 3: March, 2015

Useful Resources and Links (URL's)

European Commission, "Horizon 2020 – The New EU Framework for Research and Innovation" http://ec.europa.eu/programmes/horizon2020/en/

"Tackling Societal Challenges" http://ec.europa.eu/programmes/horizon2020/en/h2020-section/societal-challenges

"Horizon 2020 programme" http://ec.europa.eu/programmes/horizon2020/h2020-sections http://horizon2020projects.com/

"Europe 2020" - http://ec.europa.eu/europe2020/index_en.htm