Cascade European Union 7 CAPACITIES

Briefing Paper

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Priorities for EU-South Asia cooperation in research and innovation to address societal challenges

Key points

Need for EU linkages with Asian countries given the region's rapidly growing research and innovation capacities

Urgency to address major concerns shared by citizens in Europe, South Asia and elsewhere

Eleven priorities identified for cooperation in research and innovation to address societal challenges:

- Health, demographic change and wellbeing
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy
- Secure, clean and efficient energy
- Smart, green and integrated transport
- Climate action, environment, resource efficiency and raw materials
- A changing world - inclusive, innovative and reflective societies
- Secure societies - protecting freedom and security

The EU's Horizon 2020 programme reflects the policy priorities of the Europe 2020 strategy and addresses major concerns shared by citizens in Europe and elsewhere. The programme addresses the demand side of research and innovation by responding to the challenges associated with issues like climate change, security, food security, energy, health and innovation – real-world challenges that reflect the needs of society.

The need for internationalisation of research and innovation

Horizon 2020 recognises the importance of internationalisation. The EU, whilst representing only 7% of the world's population, is responsible for 24% of world expenditure on research, 32% of high impact publications and 32% of patent applications, making it a world leader in research and innovation (European Commission Communication, 2012). However, over the past few decades, new key players have emerged within the international landscape shifting the dominant position held by the EU towards emerging economies such as China, Brazil, India and South Africa.

There has been growing recognition of a need to enhance international cooperation activities focused on 'engaging with partners outside of Europe on equal terms and in programmes and activities of high mutual interest' (Annerberg et al., 2010). The need for linkages with Asian countries has been emphasised given the region's rapidly growing research and innovation capacities and the urgency to address global challenges.

This paper examines the policy and interests of seven countries in South Asia with respect to the seven thematic societal challenges identified under the EU's Horizon 2020 research and innovation programme: Health, demographic change and wellbeing; 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.

CASCADE project

This paper draws upon the findings of seven national position papers (Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka) and one South Asian regional position paper developed as part of the CASCADE project (see Reference list).

A combination of methodologies was adopted for the CASCADE study. The first was a content analysis approach on available policies in each country pertaining to the seven thematic challenges. This was followed by 348 semi-structured interviews and a further 16 focus groups conducted with 135 experts representing a diverse range of disciplines and sectors in Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka.

What is happening in South Asia?

Health, demographic change and wellbeing
South Asia faces wide-ranging public health challenges. Low life expectancy and high rates of malnutrition, infant mortality, and incidence of tuberculosis (TB) and HIV/AIDS are second only to those of sub-Saharan Africa. The region also faces challenges such as poor sanitation, poor maternal health, and poor access to healthcare services, as well as widespread malaria.

While there have been some improvements in the health sector, it has been unevenly distributed between and within countries. For example, rural areas do worse than urban areas in life expectancy, immunization rates, maternal health, malaria incidence, and access to almost all health services.

Overall the region has poor health indicators and faces an increasing burden of non-communicable diseases (NCDs).

South Asia will also experience a dramatic increase in elderly population. Bangladesh and Asia's other young populations will experience rapid population aging. For example, Bangladesh 65-and-older population is projected to rise 5 percent in 2025 and 11 percent in 2050. Despite this, there are few resources spent on the elderly: Bangladesh spends less than 0.5% of GDP on social pensions and Pakistan has no social safety net.

Financing healthcare and affordability is a major challenge across the region, as is a need to develop appropopriate healthcare information systems.

Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy

Agriculture continues to be a very important livelihood option for the vast majority of South Asia's rural population, even though the sector's contribution to the economy is shrinking.

Much of South Asia has a large agriculture sector, with high usage of land area: Afghanistan 58%; Bangladesh 70.1%; Sri Lanka 42.9%; Pakistan 35.1%. 86% of Bhutan's land area is forest.

Agriculture is also a major factor in the economy: 40% of employment in Sri Lanka is in agriculture, while 25% of Pakistan, 16% of Bangladesh and 12% Sri Lanka's GDP is in agriculture.

South Asian countries have low agricultural growth rates but an increased level of food consumption, primarily due to high population growth. Despite this, the region is ranked as the most undernourished, malnourished and food insecure region in the world.

The livelihood opportunities in agriculture are drying up, leading to a steady stream of migration to urban areas. Since the 1980s, the growth of rural populations has been steadily declining in South Asia. This will lead to more land available per person, but also a tightening of rural labour markets. A negative growth rate is expected to set in by 2030-35. This has been referred to as 'distress' migration because it is not migration through choice but because other sectors are unable to offer low-skilled employment, and does not augur well for food security.

Climate change is a long-term challenge to South Asia and the agriculture sector, affecting all four dimensions of food security: crop yields, food prices, food utilization and vulnerability of households. Evidence suggests that yields of rice could decline by 14 per cent, wheat by 44 to 49 per cent and maize by between 9 and 19 per cent.

Secure, clean and efficient energy

South Asia is likely to contribute to a major share to the incremental demand for hydrocarbons during the first half of this century. Access to electricity varies across the region, from the Maldives (99.9%) and Pakistan (91.4%) down to Bangladesh (55.2%) and Afghanistan (41%).

All the South Asian countries are highly dependent on import of fuels, particularly hydrocarbons, and this dependence has been increasing over recent decades.

There is a need to address these growing energy requirements, for example by harnessing hydro, wind, solar, biomass and other renewables. There is a need for affordable, cost-effective and resource-efficient low carbon technologies to decarbonise the energy system.

Conservation and efficiency improvements are also necessary through the development of smart national power grids, including transmission and distribution.

Smart, green and integrated transport

The region is experiencing rapidly increasing motorization and private vehicle ownership, and a corresponding reduced usage of public transport, which also suffers from weak public investment. The poorly integrated transport infrastructure is failing to match vehicle growth.

For example, in Pakistan in 1991-92, the total number of vehicles on the roads was 2.1m, but by 2006-07 the number had reached over 8m, a 285% increase. During the same time period there was just a 52% increase in the road length. In Sri Lanka, between 2003 - 2013 the total number of vehicles grew from 2m to 5m and this despite experiencing population growth of just 0.8% per annum over the same period.

Many of the vehicles are also inefficient and highly polluting. In Pakistan the average vehicle emits 20 times more hydrocarbons, 25 times as much carbon monoxide and 3.6 times as much

nitrous oxide as a vehicle in the United States, which account for 90% of pollutants.

Safety standards are also poor across much of the region's transport network. High levels of road fatalities are commonplace.

Climate action, environment, resource efficiency and raw materials

South Asian countries rank highly in the various climate change vulnerability indices. In 2011 Maplecroft ranked Bangladesh most vulnerable, while Nepal is 4th, Afghanistan 8th and Pakistan 16th. Their sixth annual Climate Change Vulnerability Index revealed that Bangladesh would feel the economic impacts of climate change most intensely and that its capital, Dhaka, would be one of the five most climate vulnerable cities in the world.

Almost 80% of Maldives population are within 300m from the shore, living on an island that is hardly 1.5m above mean sea level making them extremely vulnerable to storm surges and flooding.

Looking forward, there is a need for greater integration of climate change adaptation within national policies and planning, while pollution standards and compliance are weak. There is also a need to develop more climate resistant crops and promote economically viable ecosystems and services. There are also significant opportunities for promoting the green and blue economies.

A changing world - inclusive, innovative and reflective societies

Afghanistan has been in a protracted state of conflict, with partial destruction of core institutions and almost complete disintegration of gender equity. It has a very young and rapidly growing population, but very poor job security

Bangladesh is experiencing rapid urbanisation. The politicization of religion has resulted in slow take up and implementation of gender policies and worsening gender equity. The country also suffers from increasing youth unemployment.

Gross National Happiness (GNH) is pursued vigorously in Bhutan, but there are low literacy rates among rural populations.

The Maldives is identified as a highly inequitable society (GINI index), but also suffers from high youth unemployment, and a mixed record in gender equity, for example having poor political empowerment for women.

Nepal also suffers from high levels of inequalities based on caste, gender and income. Pakistan has low female participation rates, poor implementation of gender friendly policies and poor literacy rates.

Afghanistan (172nd), Pakistan (126th), Bangladesh (145th), and Nepal (125th) were all found to have a high perceived level of public sector corruption in the country (based on the 2014 Transparency International survey).

Overall, there is a need to improve transparency and accountability, promote greater inclusivity and improve social harmonisation among the diverse populations living in South Asia.

Secure societies - protecting freedom and security

Much of South Asia suffers from a high level of disaster risk. Seismic activity is a major problem in the region. Kathmandu, Nepal, ranked first in a 2009 GeoHazards International study of the most seismically vulnerable cities, the result of high exposure and poor building standards. Islambad and Rawalpindi, Pakistan ranked 6th.

Bangladesh was the 5th most affected country by extreme weather events during the period 1993 - 2012, while Sri Lanka had the second highest losses from the 2004 Indian Ocean Tsunami.

Much of the region is highly vulnerable to the impact of climate change.

Pakistan and Afghanistan are heavily linked to global security concerns.

Cross cutting themes

There are recurring, cross cutting themes that are present across South Asia and also impact many or all the seven societal challenges:

- Development and financing of infrastructure
- Adopting an evidence-based approach to policy
- Capacity building and sustainable development

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Priorities for EU-South Asia cooperation in research and innovation

There are wide ranging opportunities for real breakthrough research and radical innovation in response to societal challenges. The priorities for EU-South Asian cooperation include:

- Poor health indicators
- Reducing the burden of NCDs
- Financing healthcare and affordability
- Addressing the care and well being of the ageing population
- New and climate resistant crops and varieties (e.g., high yield varieties) and technologies to increase productivity and sustainability
- Protecting agricultural lands
- Improve farmers' quality of life and livelihood security
- Use of bio-technology in marine and fisheries to exploit sea based resources
- Harness hydro, wind, solar, biomass and other renewables
- Conservation and efficiency improvements through smart national power grid, including transmission and distribution
- Regional cooperation in knowledge sharing, energy development and trade
- Environmentally friendly, green transport
- 'Smart' traffic management
- Integrated transport
- Improved safety standards for all transport infrastructure and services
- Integration of climate change adaptation within national policies and planning
- Early warning, preparedness and mitigation towards increased resilience
- Promote the green and blue economy, develop climate resistant crops and promote economically viable ecosystems and services
- Management of resources and development of pollution standards and compliance
- Improve transparency and accountability towards good governance
- Greater inclusivity and improved social harmonisation among diverse populations
- Cooperation in education system reform
- Disaster risk reduction, including related information systems
- Border security, crime, and surveillance

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CASCADE (Collaborative Action towards Societal Challenges through Awareness, Development, and Education) aims to provide the foundation for a future International Cooperation Network programme targeting South Asian Countries, which will promote bi-regional coordination of Science & Technology cooperation.

CASCADE is an opportunity for raising awareness of the potential for EU-Southern Asia cooperation and stimulating regional and international participation. With the active contribution of South Asian countries, the endeavour will be to pave the way for more advanced, inclusive and innovative societies.

The project coincides with the launch of Horizon 2020, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Running from 2014 to 2020 with a budget of over €80 billion, the EU's new programme for research and innovation is part of the drive to tackle global societal challenges, and create new growth and jobs. International cooperation in research and innovation is an essential element for meeting the objectives of Europe 2020. Recognising the global nature of producing and using knowledge, Horizon 2020 builds on the success of international cooperation in previous framework programmes and is fully open to participation from third countries.

The eighteen month CASCADE project is being undertaken by a consortium of eighteen organisations from five European countries and seven South Asian countries: Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan and Sri Lanka. During the project, the team has been:

1. compiling a regional position paper that identifies global challenges and research priorities

2. mapping and developing an inventory of national and regional stakeholders related to global challenges

3. raising awareness on research & innovation priorities for fostering cooperation and towards building mutual understanding on how to address common global societal challenges

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