BECK

CAPACITY BUILDING FRAMEWORK

Deliverable D.1.3 of Work Package 1

A report of the BECK Project WP1: Integrating education with consumer behavior relevant to energy efficiency and climate change at the Universities of Russia, Sri Lanka and Bangladesh (BECK)

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Integrating education with consumer behaviour relevant to energy efficiency and climate change at the Universities of Russia, Sri Lanka and Bangladesh/ BECK

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Leading Institutions for WP1

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P2 - University of Huddersfield (UoH) - United Kingdom

Other Partners

Estonia

P3 - Tallinn University of Technology (TTU)

Italy

P7 - Alma Mater Studiorum – University of Bologna (UNIBO)

Russia

P4 - Moscow State University of Civil Engineering (MGSU)

P5 - Kaliningrad State Technical University (KSTU)

P8 - Peter the Great St.Petersburg Polytechnic University (SPbPU)

P9 - International Public Organization of Assistance to Construction Education (ASV)

P10 - M. V. Lomonosov Moscow State University (MSU)

Sri Lanka

P12 - University of Colombo, Sri Lanka (UoC)

P14 - University of Moratuwa, Sri Lanka (UoM)

Bangladesh

P11 - Patuakhali Science and Technology University (PSTU)

P13 - University of Barisal (BU)

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1 INTRODUCTION TO THE BECK PROJECT

Climate change is a result of modern human lifestyles and activities: heating in buildings, power consumption, cars and aircraft, industrial companies and other activities in the built environment contribute greatly to climate change. Climate change leads to extreme weather events, such as storms, flooding, droughts and heat waves. In the last decade, the world suffered thrice as many weather-related natural disasters as in the 1960s. One of the possible solutions to these problems is improvement of education on consumer behaviour related to energy efficiency and climate change. The main challenge is to consolidate a variety of diverse activities in education quality improvement, such as the delivery of extensive educational programmes and capacity building, the continued knowledge sharing, etc. In order to progress on these efforts, it is necessary to build the capacity and an associated network of experts and institutions.

The education sector is vitally important for social and economic development of Russia (Region 4), Sri Lanka and Bangladesh (Region 6). Both regions distinguish education in *Engineering and engineering trends* as a key priority (Category A). This priority covers *Environmental protection technology*, including solutions relevant to energy efficiency and climate change.

Wider objective of the project – to upgrade the curricula with the 16 new harmonized study MOOC modules on consumer behaviour related to energy efficiency and climate change at the universities of Russia, Sri Lanka and Bangladesh in order to increase their capacity to continually modernise, enhance the quality and relevance of education of students to the global labour market needs and to ensure international cooperation.

Main objectives of the BECK project:

1. To upgrade curricula to improve their quality for BSc/specialists, MSc and PhD students by adding 16 new, harmonized and standardized study MOOC modules on consumer behavior related to energy efficiency and climate change (BECK) at the universities of Russia, Sri Lanka and Bangladesh(PC universities henceforth), to enhance the quality and relevance of education in PC and EU universities to global issues;
2. To transfer European practices in education (learning and teaching tools, methodologies and pedagogical approaches including learning outcomes and ICT-based practices) from participating EU universities to PC universities;
3. To assist competence development of teachers within PC universities;
4. To develop the Simulated Big Data Interuniversity Networked Affective Educational Centre to encourage use of ICT-based methodologies in education and research;
5. To strengthen educational and scientific networking among EU and PC universities in the BECK field.

The project in general terms also will spread and promote the awareness in the Partner Countries related to the EU policies referred to Energy Efficiency and Climate Change approach

towards EU best practices, with specific reference to the “Environmental & Energy 20-20-20 targets”. The dissemination of the benefits of the curricular reform all over other HEIs will be performed as well.

2 INTRODUCTION TO PARTNER REPORT

The purpose of this series of country reports is to obtain general philosophical, pedagogical and practical understanding on the status of higher education and its impact on consumer behaviour relevant to energy efficiency and climate change in BECK partner and European partner countries. It will also provide a basis for understanding and evaluating the capabilities of partner institutions on integrated education for energy efficiency and climate change. The results of these reports will inform a capacity building framework, which will form the basis for development of modules on energy efficiency and climate change during the BECK project.

The reporting approach is based on the Capacity Needs Assessment Methodology (CAPNAM) proposed by the United Nations (2013).

The report includes chapters on the following:

- **Methodology:** This section describes the methodological approach used to collect and analyse the data that informs the findings presented in this report.
- **Context:** Provides an overview of the regulatory, socio-political, and cultural factors that shape policy on the consumer behaviour relevant to energy efficiency and climate change in the country in general, and education in particular.
- Scope and coverage of education policies on consumer behaviour relevant to energy efficiency and climate change by the Higher Education Institution (HEI). Examines the illustrative policy and planning issues relevant to integrated education on consumer behaviour relevant to energy efficiency and climate change.
- Description of capacity types: Evaluates the existing state of capacities of HEI in the field of integrated education on consumer behavior relevant to energy efficiency and climate change. As defined by the CAPNAM analytical framework, the four types of categories are institutional, organizational, individual, and the knowledge base

3 METHODOLOGY

Different methodological approaches were used to collect and analyze data for preparation this report.

The method which was used was based on identefication of existing key capacities and additional capacities to be developed to reach objectives. By means of desired capacities analysis against existing capacities, an understanding of capacity assets and needs was ahcieved. This was used as input for formulating a capacity development response that addressed institutional capacities that could be strengthened and existing capacities that are already strong and can be optimized.

- Workshops and focus groups were organized in frames of the ASCENT project meeting (14-01-2019) in Colombo, attended by 18 participants, and the BECK kick-off meeting (28-02-2019 – 01-03-2019) in Colombo, attended by 38 participants. Needs, gaps and possibilities for common curricula development were identified.
- An extensive literature review was conducted to gather information on education system, education policies, educational gaps and needs, staff trainings, curriculum development which are the required/ identified information based on the Capacity Needs Assessment Methodology (CAPNAM) proposed by the United Nations (2013) in levels of country, organizational and individual.
- Based on the requirements for the report, many web sites were referred including websites which are belonged to government ministries, different universities, University grant commission, non-government organizations etc.
- Interviews and rounded table discussions were conducted in the institutional level according to requirements of information for the report and academic staff (including professors, senior lectures, lectures), non-academic staff (including deputy registers, senior assistant registers academics/examination, scientific assistants, industrial placement officers, directors of units),technical staff (including research assistants, demonstrators, technical staff) and students were intervened through the process.
- The collected information was used to develop the report by the reporting committee with the consultants who are engaged with the project.

4 BRIEF INTRODUCTION OF PARTNER INSTITUTIONS

In total 10 Institutions from Russia, Sri Lanka and Bangladesh (Partner countries) and 4 European Institutions participate in the BECK project.

Partner 1
Vilnius Gediminas Technical University (VGTU)
Vilnius, Lithuania

Vilnius Gediminas Technical University (VGTU) is one of the biggest universities in Lithuania. It was founded in 1956. VGTU encompasses the following: nearly 77,000 alumni over more than 60 years of the existence; more than 10,500 students; 10 faculties; 14 research institutes, 2 research and 4 training centres, 33 research laboratories; 940 academic staff members; over 100 study programmes based on three-cycle structure: undergraduate, graduate and post-graduate; over 400 business partners all over Lithuania and over 500 partner higher education institutions all over the world. In 2017–2018 QS World University Rankings, VGTU ranks at 551-600 place and now is among the top 2.1% of the best universities in the world. VGTU is ranked 43rd in the "QS University Rankings: Emerging Europe and Central Asia 2015-2016" rankings, and is the leader among technical universities of Lithuania.

VGTU is a member of over 50 international organisations and has over 200 partners consolidated by international projects. VGTU implements many international projects under different funding programmes, such as COST, EUREKA, FP-5, FP-6, FP-7, INTERREG IIIB, and PHARE. Curricula adjustments to meet labour market requirements and the quality assurance in studies are the main priorities in the development plan of VGTU. VGTU is a participant in the EU-Korea, EU-ALFA3 and the EU-Asia link projects. It was awarded the ECTS label in 2006 and the E-Quality Label of European National Agencies in 2007. VGTU is the leader in Lithuania by the number of students, studying under the Erasmus Exchange Programme abroad.

The Department of Construction Management and Real Estate, directly involved in project activities, is committed to developing web-based intelligent, biometric and computer learning systems for real-world applications in construction and real estate. The department focuses its research on multi-variant decision support systems in construction, health and safe house, energy efficiency, climate change, online artificial intelligence technologies, e-city, and big data analytics. The department is active in R&D projects and is currently involved in number of different projects in the EU, Africa and Asia. In the course of these projects, the department has contributed to the scientific community – in the last three years published over 20 articles in ISI Web of Science journals.

Partner 2
University of Huddersfield (UoH)
Huddersfield , United Kingdom

Global Disaster Resilience Centre (GDRC), at the University of Huddersfield, UK – a key *leader in inter-disciplinary research, education and advocacy to improve the resilience of nations and communities* and we are working with stakeholders at the global, national, municipal and local level to make this happen. At the GDRC, our vision is for a society that has the capacity to resist or change in order to reduce hazard vulnerability, and to continue functioning physically, economically and socially when subjected to a hazard event. GDRC is a key partner of the UNISDR Making cities resilient campaign and is also a member of the UNHABITAT University network initiative. It is working with UNISDR to raise awareness and commitment for sustainable development practices that will reduce disaster risk and increase the wellbeing and safety of citizens and contributes as a main global partner in the campaign, and also towards the overall goal - empower local governments with stronger national policies to invest in risk reduction at local level. Members of GDRC have published collectively more than 50 Journal papers in the field and generated more than £ 2 Million research income. The University of Huddersfield (UoH), where GDRC is based, is one of the leading universities in the UK and was named Times Higher Education University of the Year in 2014. In 2013 in which the University was awarded the two Queen's Awards for Enterprise and in 2012 it was awarded prestigious Entrepreneurial University of the Year at the Times Higher Education Awards. it is also in the top 10 in England for teaching excellence and is ranked in the top 10 nationally for undergraduate and postgraduate employability. In 2014, The University of Huddersfield was awarded the Times Higher Education Best University Workplace and topped the tables in all four main categories in a survey carried out amongst staff in higher education across the country. Please visit: http://www.hud.ac.uk/research/researchcentres/gdrc/ to read more about the research centre.

Partner 3

Tallinn University of Technology (TTU)
Tallinn, Estonia

Tallinn University of Technology (TTU) is a modern university of engineering and technology, the strength of which lies in the synergy of engineering, natural, exact, social and health sciences. Teaching is based on internationally recognised research work and the graduates are highly rated on the labour market. TTU is a motor of economic development in Estonia; the nearly 70,000 alumni of the university have shaped the economic landscape of today's Estonia. The university has 700 lecturers and more than half a thousand research staff. The TTU campus, which is situated on more than 50 ha, includes 72 buildings and accommodates more than 200 high-tech companies. The students are offered superb student and cultural life; the

accommodation and sporting facilities are one of the best in the Baltic Sea Region. TTU´s history dates back to 1918. More than 11,000 students are studying at Tallinn University of Technology. Foreign students constitute more than 13% of the students of the university. Of all the foreign students studying at Estonian universities 35% are studying at Tallinn University of Technology.

The Building Lifecycle Research Group within the Department of Building and Architecture is responsible for the fulfilment of the civil engineering curricula. It is a leading provider of higher education and research services to the Estonian construction industry not only in terms of full-time graduate courses but also through distance learning, lifelong learning and continuous professional development courses. The Building Lifecycle Research Group has established long-term partnerships with construction and property organizations in Estonia and is an active partner in universities' network internationally. This ensures that research and education programs maintain close alignment to the current needs of the construction industry, and promote improvements in industry practice through innovation. The research field: multivariant simulation modelling of management strategies in construction, impact of climate change, disaster resilience, big data analytics, smart buildings, BIM, nearly-zero energy solutions, etc.

Partner 4
Moscow State University of Civil Engineering (MGSU)
Moscow, Russia

The Moscow State University of Civil Engineering (MGSU) is one of the top universities in the field of construction science and building technology in the GUS countries. It is committed to high quality in research and teaching, interdisciplinary education and the active promotion of promising young specialists and scientists. MGSU has a dynamically developing scientific and innovative infrastructure. MGSU was one of the first universities in Russia to be named a National State Research University and covers priorities of the National Research University for Building and Architecture and a number of priorities for the development of science, technology and engineering in the Russian Federation.

MGSU's scientific and innovative areas cover theoretical and experimental studies of global, regional and local importance with priority areas like "Industry of Nano-systems and Nano-materials", "Emergency hazardous processes in the construction industry", Climate Saving Habitat Design", Construction Material Sciences", "Information and Robotic systems", "Construction management", "Environmental management", "Energy and Energy Saving", "High technology in construction and architecture", "Sustainable building and Urban design" and others.

The university is developing strong links with companies and scientific institutions across the GUS countries and worldwide. It is coordinating scientific research of the university sector of engineering science in the GUS countries through the International Association of Building

Universities (IABU). Presently, more than 150 Russian universities and faculties became this Association's members as well as those from the Commonwealth of Independent States (CIS).

MGSU's scientific and innovative infrastructure is a well-organized system of cooperation with strategic partners, involving federal and regional construction complexes, real sector enterprises and it covers all spheres of the University activities. Many MGSU's scientists are winners of grants established by the President of the Russian Federation, Russian Federal Property Fund and other international funds.

Partner 5
Kaliningrad State Technical University (KSTU)
Kaliningrad, Russian Federation

KALININGRAD
STATE TECHNICAL
UNIVERSITY

Having been founded on the basis of Moscow Technical Institute for the Fishery Industry, Kaliningrad State Technical University (KSTU) is justly considered as the beginning of Russian higher fishery education and a range of scientific schools in navigation, commercial fishery, and progressive technologies of food production. At present, it develops as a multi-disciplinary institution considering the demands and the economic potential of the Region, maintaining traditions of high quality specialist training for the fishery industry.

Students are trained in 42 higher educational courses at various levels, namely, Bachelor, Professional Diploma, Master, post-graduate (Kandidat Nauk) and doctorate (Doktor Nauk) Degrees; professionals are offered various upgrading courses.600 teachers and researchers, including 75 professors holding the Doktor Nauk Degree, 80 academicians and corresponding members of international and public Russian Academies of Science form the faculty if the University. 28 scientists are awarded titles of honoured workers of science, Russian higher education, branches of science, and the fishery industry.

Scientific research is traditionally undertaken in many areas being the most important for the modern navigation, fisheries and seafood processing, power engineering, construction, production automation and control, information technology, natural science, nano-technology, etc. The University founded effectively working schools in ichthyology, commercial fishery, ship-building and repair, automation of production and control, technique and technology of raw materials processing. There are 12 research laboratories and scientific centers, four of them being of the applied character. Four dissertation councils work at the University.

Recently, intensification of scientific work has involved the University into 25 federal scientific programmes, as well as in TEMPUS and TACIS projects. Regional representatives of public professional Academies of Science applied Centre for new Information Technologies, Research Institute for Maritime Engineering Service, Institute of Ecology and Sustainable Development successfully operates on the University basis.

International co-operation of the University with foreign educational and research organizations is constantly expanding, with the Baltic Sea region in particular.

Developing progressively, Kaliningrad State Technical University looks ahead with confidence.

Partner 6
University of Ruhuna
Matara, Sri Lanka

University of Ruhuna (UoR) is one of the leading Universities in Sri Lanka functioning since 1978. It's vision to be the prime intellectual thrust of the nation. It is a multi-campus University with 10 faculties scattered in southern provincial cities of Matara (Faculties of Science, Humanities &Social sciences, Marine Resources, Management & Finance, and Graduate Studies), Galle (Faculties of Medicine, Allied and Health Science and Engineering) and in Kamburupitiya (Faculty of Agriculture and Technology). During the 40 years of the existence, university has expanded its horizons to be an entrepreneurial University, by developing and upgrading teaching, research and extension programs through international collaboration with many higher educational institutions around the world and linking with reputed industries.

The University offers basic degree programs in their respective disciplines. Depending on the facilities available, MA, MBA, MSc, MPhil and PhD degrees are also offered. In addition, diploma and certificate courses are offered in various disciplines.

Please visit Website: http://www.ruh.ac.lk for more details about University of Ruhuna.

The Faculty of Agriculture, the partner of this project, is one of the pioneering faculties of the University, Faculty has seven academic Departments of study, namely, Agricultural Biology, Agricultural Economics and Extension, Agricultural Engineering, Animal Science, Crop Science, Food Science & Technology and Soil Science. The Faculty offers 3 undergraduate degree programs, BSc Agricultural Resource, Management and Technology, BSc Agribusiness, Management and BSc Green Technology all being of 4-year duration. The annual enrolment of the faculty for undergraduate programs are around 250, making the population of undergrads in the faculty towards 1000 while identifying itself as the leading center for agricultural research, extension and teaching in the southern Sri Lanka.

The team member of BECK project belongs to the Department of Agricultural Engineering, of the Agriculture Faculty. The department thrives to become nationally and internationally recognized in developing and applying engineering principles and techniques for natural and agricultural production systems. Since 2000, department of Agricultural Engineering took a leading role in climate change impacts and alternative energy sources in collaboration with

many national, and international universities and agencies. These programs received high recognition nationally and internationally.

Please visit http://www.agri.ruh.ac.lk for more details about Faculty of Agriculture University of Ruhuna and the Department of Agric. Engineering.

Partner 7

Alma Mater Studiorum – University of Bologna (UNIBO)
Bologna, Italy

The University of Bologna was founded in 1088 and is considered to be the oldest university in Western Europe. Nowadays, it still remains one of the most important higher education institutions across Europe with around 85,000 enrolled students, 11 Schools, 35 research departments, 6000 employees.

The University of Bologna is today the most internationalised of all Italian universities. The number of foreign students regularly enrolled is around 6000, while another 2000 arrive every year on international mobility programmes such as LLP/Erasmus, Overseas and Erasmus Mundus Action II. The number of outgoing students on study grants is more than 2,000 per year.

The UNIBO academic offering comprises around 200 Bachelor and MA programmes (40 of which are joint programmes, 25 taught in English) and 53 Doctoral Programmes.

UNIBO has recently developed a new internationalization plan which also includes new strategies aimed at removing obstacles to mobility and increasing the international dimension of study programmes.

In this framework, UNIBO fosters the institutional participation in several EU programmes, networks and initiatives on internationalization of higher education and development cooperation. Through its International Relations Division, UNIBO provides support to all its Schools and Research Departments in order to participate in several projects (EuropeAid, of the previous Lifelong Learning, Erasmus Mundus and Tempus Programmes and in the Erasmus Plus Programme).

UNIBO has increased its cooperation with Russia and has already carried out different mobility initiatives either for professors or students with other higher education institutions. It is actively participating in several EU projects targeting this area: it coordinates a Tempus II project 'Actions of Lifelong Learning addressing Multicultural Education and Tolerance in Russia (ALLMEET); it is partner in Tempus II Project 'DEFRUS: Development of Qualification Framework for Food Science Studies at Russian Universities', in Erasmus Mundus Action 2 projects TRIPLE I, AURORA I, AURORA II focusing on Russia.

Partner 8
Peter the Great St. Petersburg Polytechnic University (SPbPU)
Saint Petersburg, Russian Federation

Peter the Great St. Petersburg Polytechnic University (SPbPU) is a major Russian technical university providing courses in engineering, physics, economics, humanities and information technology. SPbPU offers 50+ Bachelor's degree programs, 200+ Master's degree programs, 90 doctorate programs and 90 PhD programs, in addition to non-degree and international education programs. SPbPU is a national research university which combines multidisciplinary R&D activities with advanced technology to prepare graduates to work in today's competitive marketplace.

SPbPU educates more than 31,000 students with about 6 000 international students including from over 100 countries. The university has partnerships with about 300 universities, about 130 scientific and research institutions and over 150 companies from over than 50 countries. SPbPU is home to over 20 international research centers which carry out research collaborations with major companies including LG, Electrolux, GM, Statoil, PHILIPS, etc.

In 2007 SPbPU won a contest "Innovation University" financed in the framework of the national project "Education". In 2010 SPbPU gained the status "National Research University". Nowadays SPbPU develops as a new type research university, which integrates multidisciplinary R&D activities and advanced technologies for rising national economic competitiveness.

Partner 9
International Public Organization of Assistance to Construction Education (ASV)
Moscow, Russian Federation

Structure of the "International Public Organization of Assistance to Construction Education" (ASV) includes more than 150 Universities. The basis of the ASV was put regional structure. There are now 11 regional offices in Russia and 9 offices in CIS countries. The ASV members from CIS countries are representing Civil Engineering Higher educational establishments of Belarus, Kazakhstan, Uzbekistan, Kyrgyzstan, Tajikistan, Turkmenistan, Azerbaijan and Armenia.

The main directions of the ASV activities are the following:

- to combine efforts of the ASV members to the practical solution of all actual organizational, academic, scientific, economic and social problems related to the development of Civil Engineering (CE) education, science and technology;

- to study and popularize the progressive methods in the field of professional education, research and management;
- to propose the necessary changes in the list of active CE specialties;
- to develop present-day methods of academic, methodological, scientific and publishing activities of CE Universities, Institutes and Faculties;
- to control the quality level of teaching on the basis of professional standards with the help of different tests, exams and special accreditation procedures.

The ASV realizes its activity in different ways and forms:

- carries out complex long-term programs in educational, scientific, social and other problems;
- holds conferences, symposia and special meetings devoted to actual problems of CE education;
- arranges contests and competitions of students works, including diploma works;
- gives its consent to the opening or closing of any CE specialty at any Higher Educational establishment;
- makes preliminary examination of competitors for academic degrees;
- publishes textbooks and other special literature.

The ASV members maintain broad international ties in the areas of academic and research works with many Universities, Institutes, Colleges and professional firms from large number of countries all over the world.

Partner 10
M. V. Lomonosov Moscow State University (MSU)
Moscow, Russian Federation

Moscow State University was established in 1755. More than 40 000 students (graduate and postgraduate) and about 7 000 undergraduates' study at the university, and over 5 000 specialists do the training courses here. More than 6 000 professors and lecturers, and about 5 000 researchers work for the faculties and research institutes.

Every year Moscow University enrols about 4 000 international students and postgraduates from all over the world.

Moscow University campus is an extremely complex system, with its 1 000 000 m2 floor area in 1 000 buildings and structures, with its 8 dormitories housing over 12 000 students and 300 km of utility lines.

MSU library system is one of the largest in Russia, with its 9,000,000 books, 2,000,000 of them in foreign languages, and the average number of readers 55,000, using 5,500,000 books a year.

The Faculty of Economics was founded in 1941. The Faculty offers bachelor programs in 2 subject areas: Economics and Management; 10 Master programs in three subject areas: Economics, Management, Finance; and 6 PhD programs. Faculty's staff is actively involved in research activity.

Partner 11
Patuakhali Science and Technology University (PSTU)
Patuakhali, Bangladesh

Patuakhali Science and Technology University (PSTU) is one of the fast growing new public universities, located in the coastal sub-district Dumki under Patuakhali District. The university carried out its academic program since 1979 establishing Agriculture faculty. Total area of the university is about 89.97 acres. There are about 4,000 students in the University. The aim of the university is to be a home of excellence for producing competent professionals with improved knowledge and skills to meet national and global challenges.

PSTU provides cutting-edge education, research, training, and develops entrepreneurship at both undergraduate and postgraduate levels for creating skilled and enlightened personnel to serve the nation. For this, the PSTU has been offering undergraduate and postgraduate programmes in Agriculture, Computer Science and Engineering, Business Administration and Management, Animal Science, Veterinary Medicine, Fisheries, Disaster Management, Nutrition and Food Science, and Land Management and Administration.

Climate change is a global issue in modern era. The university is also working for a long time to meet the change challenges. Thus, the university has opened two new faculties namely faculty of Disaster Management and Land Management and Administration. The academic programmes are adopted with commitment to provide and mentoring our students a global career by the updated curricula. We, therefore, present an environment for teaching, research and entrepreneurship development in various disciplines of the university. We believe our success lies in our passion for teaching, learning and research. Our challenge for the future is to build on this strong base to establish ourselves firmly among the leading universities.

Partner 12
University of Colombo, Sri Lanka (UoC)
Colombo, Sri Lanka

University of Colombo (UoC) is the oldest University in Sri Lanka and its International Unit is responsible for its internationalisation strategy. UoC is an internationally well-known university for students. Also it is also encourage staff to enhance their capacities to conduct internationally collaborative research and publish internationally. Academics in various disciplines engage in high quality research of local and international relevance. Details of ongoing research, and publications, are available on the websites of the different Faculties and Institutes. Research among students is also encouraged. The first Annual Research Symposium held in 2008 gave students a forum to present their research to the scientific community in Sri Lanka. Staff and students from all faculties participated in this symposium. The main objective of the Annual Research Symposium is to disseminate new knowledge acquired through research conducted by the academic community of the University. The symposium also promotes healthy interaction between the Faculties and Institutes of the University of Colombo.

Partner 13
University of Barisal (BU)
Barisal, Bangladesh

The University of Barisal (BU) is the biggest university in Southern Bangladesh. The University of Barisal (BU) is a place without limits where teaching, research, service, and innovation merge to improve lives in Barisal and beyond. We are not afraid to ask bigger questions, to get better answers. Established in 2011, the University of Barisal, the state's super land-grant (50 acres) university with six faculties, produces graduates who are real-world ready through their intense academic and co-curricular engagement. University of Barisal offers education and research in multidimensional fields like (arts, law, social sciences, bioscience, biotechnology, engineering and earth sciences. It is the flagship educational institution in the country, a place where more than 170 teachers and 7000 students develop and share knowledge and their skills. It is very fast growing university with the commitment of high quality research support to produce world class graduates.

The University of Barisal (BU) is working on climate change related issues with its high class researchers who are nationally and internationally recognized for expertise in climate research, adaptation, and building practical, science-based solutions for managing risk. The academic programmes are adopted with commitment to make its students competitive in global career by the updated curriculum. BU helps develop and link research-based knowledge with decision-

making at multiple scales. The primary objectives of BU family is building network of climate related research with national and international community to understand the mechanism and effects of climate change and adaptation technique and solution-based decision for policy making. We are involved in numerous international research collaborations and integrate practical experiences in our curriculum, so that students work on real-life projects in partnership with business, government and community sectors. We aim to bring together the best minds in individual fields, and encourage researchers from different disciplines and institutions to work together to find lasting solutions to society's pressing problems. Keeping these views to exchange tertiary level education and research, the university has signed MoU with the University of Sheffield, UK and various organizations.

Barisal University is an educational and research based institution which awards academic graduate and postgraduate degree in arts, humanities, social science, law, business, science, engineering, and bio science. The aim is preparing the graduates to meet global challenges.

Partner 14
University of Moratuwa
Moratuwa, Sri Lanka

University of Moratuwa was first started as a Technical school in 1893 and then that was converted to a fully-fledged university in late 1978 under the Universities Act No.16 of 1978 and operates under the general direction of the University Grants Commission (UGC). It's an independent state university located at Katubedda, Moratuwa overlooking the picturesque Bolgoda Lake and about 20km away from the capital of Sri Lanka. It is famous as a technical university however, with the recent addition, there are 5 faculties. There are about 450 academic staff and about 650 non-academic staff and the annual intake is about 1500 undergraduates.

The Faculty of Engineering which is the project partner is the first faculty there. Among all five faculties, Faculty of Engineering holds about 70% of the University and it has an annual intake of around 900 students. It consists of 12 independent departments and out of that the biggest department is Civil Engineering. The main aim of the University is to produce state of the art undergraduates, however, there are many postgraduate courses as well as produced a significant number of postgraduates per year.

5 CONTEXT

This section provides an overview of the regulatory, socio-political, and cultural factors that shape policy on the consumer behaviour relevant to energy efficiency and climate change in the country in general, and the education in particular. Mainly, this section is based on the current context of Russia, Sri Lanka and Bangladesh and as a view of partner universities from those countries 5 universities from Russia, 3 universities from Sri Lanka and 2 universities from Bangladesh.

5.1 Socio-political and cultural context

The socio-political and cultural contexts providing the framework for educational policy planning in the field of consumer behaviour relevant to energy efficiency and climate change in the countries and regulations and plans to support them are discussed under this topic.

Russian Context

Today, energy efficiency and energy saving are the most important priorities of the world economy. These areas offer opportunities to address such pressing global problems as the growing shortage of energy resources and negative impact on environment. Improvement of energy efficiency and energy conservation is key task in creating conditions for sustainable energy development at all society levels - local, regional, national and global. Public awareness campaign in the field of consumer behavior relevant to energy efficiency and climate change: At the local level in schools and universities:

Russian wide project “SPARE” is held in schools every year (it is the largest international educational project for schoolchildren on education relevant to climate change and energy efficiency). The main topics of this project are:

- Projects on energy conservation, energy efficiency and renewable energy.
- Projects on implementation of energy saving and energy efficiency
- Renewable energy supply projects
- Energy saving projects through resource saving measures
- Public awareness/promotion of energy efficiency

Universities provide different type of seminars, forums (for example, International Youth Forum «ECOBALTICA»), "Greenday" festivals, master's programs, internship programs related to the implementation of energy efficiency programs and problems associated with climate change.

At the governmental level: Annual all-Russian projects competitions in the field of energy saving and energy efficiency ENES are held with Russian Federation Ministry of energy and Interdepartmental coordination Council for energy saving and energy efficiency in order to stimulate at regional and municipal levels implementation of projects for improving energy efficiency and promoting energy-saving lifestyle among the population. Also in July 2018 was signed Federal law about information support for the regional programs implementation, which

provides public awareness campaign in the field of consumer behavior relevant to energy efficiency and climate change in the country.

The Russian Federation has one of the highest potentials of renewable energy sources in the world. The country has everything necessary to increase energy efficiency and reduce the cost of clean energy production [1]. Federal Law N 261-FL, 23.11.2009 governs the relations on energy efficiency and energy saving in the Russian Federation [2]. The purpose of the Federal Law is to create legal, economic and organizational basis for promoting energy saving and energy efficiency. The behavior of consumers related to energy efficiency and climate change in more detail is considered in the following subprograms: “Energy Saving and Energy Efficiency” and “Development of Renewable Energy Sources” of the State Program of the Russian Federation “Energy Efficiency and Energy Development” [3]. However, there is no document similar to the EU Directive (2006/32 / EC) “On the efficiency of energy end-use and energy services” in Russia [4].Considering this [4,5], we can distinguish the following socio-political and cultural provisions, which can provide a basis for planning educational policies in the area of consumer behavior related to energy efficiency and climate change:

1) The strategy of ecological culture development among Russian Federation population to ensure the sustainable development of the country;
2) Sustainable environmental management as the way to solving acute economic and socio-political problems;
3) Ethics in energy efficiency issues: rejection of corruption, voluntary energy audit, public standards;
4) Energy saving culture priority for sustainable development.

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[1] Energy revolution: The prospect of the formation of the system of energy security of the Russian Federation. - Greenpeace. -2009.-P.44.

[2] Federal Law of 23.11.2009 N 261-ФЗ (as amended on 12/27/2018) “On energy saving and on increasing energy efficiency and on introducing amendments to certain legislative acts of the Russian Federation” (as amended and added, effective from 01/16/2019).

[3] The state program of the Russian Federation "Energy Efficiency and Energy Development". Approved by the Government of the Russian Federation on April 15, 2014, No. 321.

[4] Shchelokov Y.M. Energy Saving of Russia: Issues of Efficiency and Policy / Energy Saving. -2017, №.-C. 28-32.

[5] Towards sustainable development. 2009-2011, Institute for Sustainable Development. –Analytical review. sustainabledevelopment.ru ›upload / File. - p.46

The educational policy in the sphere of higher education in Russia is regulated by Federal Law of Education and Federal Educational Standards. There's a special Educational Standard designed for each of the subject area of Higher Education, qualifications and levels. For this report we analyzed Federal standards for Bachelor level program. It is important that the principles of consumer behavior relevant to energy efficiency and climate change were introduced on bachelor level to make sure that most part of the students were covered as not all of them would continue education on Master level.

The policy in Higher education in Russia provides framework for designing educational programs and curriculum using competence based approach. Each educational standard requires that program covers 3 groups of competences which should be developed during the education: generic competences, subject specific and program specific competences. The group of generic competence is the same for all specializations. However, they do not include competences, which are relevant to consumer behaviour relevant to energy efficiency and climate change.

At the same time if we will take a look at the UN Development Goals which Russia committed to achieve, we may see the Goal # 13 – 'Take urgent action to combat climate change and its impacts – which includes eight indicators to evaluate the achievement of this goal. Unfortunately, Rosstat (The Agency on Statistics in Russian Federation) does not develop these indicators for Russian Federation and the data is not collected. Therefore, it can be stated that there is insufficient attention given from the Government.

The programs are aimed at shaping an energy efficient society in Russia, increasing the level and quality of life of the population through realizing the potential of energy saving and increasing energy efficiency based on modernization, technological development and the transition to a rational and environmentally responsible use of energy resources. According to the State Program, in the period from 2011 to 2020, at least 450 thousand specialists responsible for energy saving and energy efficiency in federal and regional executive authorities, organizations with the participation of the state and municipal entities and other organizations and institutions should undergo training.

In the framework of the State Program, the Subprogramme "Methodological, Informational and Personnel Support of Energy Saving and Energy Efficiency Measures" was adopted. In particular, "promoting the formation of a lean model of behavior of the population, including the creation of a set of tools for informing citizens about possible typical solutions for energy saving and energy efficiency". "The promotion of a lean model of population behavior is aimed at stimulating positive public opinion about the need for energy saving and energy efficiency. This goal will be achieved through a set of activities for various target groups."

The town-planning Code of the Russian Federation and strategy of spatial development of the Russian Federation define sustainable development of territories of the country as the main direction of town-planning. As part of this approach, the introduction of energy efficiency

technologies at all stages of the life cycle of the urban facility becomes one of the most urgent. Everyone understands that the introduction of energy-efficient technologies is a very urgent agenda on which the climate of the planet depends. There are a number of socio-economic problems that hinder the development of this topic:

-The high cost of technology that is not available to its users
-Low level of users' knowledge about technologies.

In this aspect, the development of education in this area becomes the main direction for the introduction of these technologies in life. It is necessary to implement an interdisciplinary approach at the junction of urban planning, operation of urban infrastructure, engineers of energy-efficient technologies. The introduction of these technologies is necessary from the first stage of planning and design of the urban environment – the formation of urban strategies of energy-efficient sustainable city, selection of space-planning solutions and, further, the introduction of technologies in urban processes.

Sri Lankan context

Sri Lanka enjoys a remarkable progress, in terms of basic education indicators, compared to many other developing countries in the world. Education is generally state-funded and it is free to all from Kindergarten up to the University education [6]. In the national constitution, it states that everybody has an equal right to access all levels of education. It helps to promote democracy, moral, physical and spiritual aspects, and engage with lifelong learning. Same time It also helps to develop deeper understanding of the environment, culture and rich religious heritages of Sri Lanka. Accordingly, skills necessary to meet the country's needs is met by the Free Education [7] Currently Sri Lanka has a literacy rate of 92%. This is higher than elsewhere in South Asia. Education is regulated by the ministries devoted to National Ministry of Education for Primary and Secondary schools and the Ministry of Higher Education for University Education [7].

Sri Lanka is fully committed on mitigation strategies to reduce global warming, to reduce disasters and ratified the United Nations Framework Convention on Climate Change (UNFCCC) in November 1993 [8].

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[6] Liyanage, I.M.K., 2014. Education System of Sri Lanka: Strengths and Weaknesses 116–140.

[7] www.justlanded.com, 2019. Sri Lanka Guide: Education in Sri Lanka, An overview of the system: The Sri Lankan government has invested [WWW Document]. URL https://www.justlanded.com/english/Sri-Lanka/Sri-Lanka-Guide/Education/Education-in-Sri-Lanka (accessed 4.30.19).

[8] Silva, A., 2009. Climate Change and Sri Lanka Climate Change and Sri Lanka Ajith Silva Director/ Policy and Planning Ministry of Environment and Natural Resources Sri Lanka [WWW Document]. URL https://unfccc.int/sites/default/files/nwp_integration_silva.pdf (accessed 4.10.19).

Over the last two decades Sri Lanka made a significant contribution towards the improvement of national policy and strengthening of legal and institutional capabilities to implement at undertakings and obligations. As an action Sri Lanka established a Climate Change Secretariat under the Ministry of Mahaweli Development and Environment. A national Climate Change Policy has been adopted in 2012 adopted [9]. A National Adaptation Plan for Climate Impacts in Sri Lanka 2016-2025 was drafted to "mainstream climate change issues within the overall national effort towards sustainable development, to create the conditions necessary to overcome the existing major gaps [10].

The issues pertaining to the country's vulnerability to climate change, multifaceted issues of climate change on the society, and capacity building to make prudent choices in decision making are looked after by this plan. Public awareness on conservation and sustainable use of resources to mobilize commitment and participation of all stakeholders are looked after by the plan [11].

The National Council for Sustainable Development was formed in 2009 under the chairmanship of the HE the President of Sri Lanka to provide leadership and guidance for sustainable development [12] . The Council is responsible to produce an integrated policy, for overseeing and guiding the implementation. The development of education to address climate change, as an objective for national climate change policy to enhance knowledge on the multifaceted issues related to climate change in the society is much in line with the capacity building for decision making to address the climate change issues effectively and efficiently [13].

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[9] Ministry of Mahaweli Development and Environment, 2016. Climate Change Secretariat, Ministry of Mahaweli Development and Environment.

[10] Athula Senaratne, K.W., Perera, N., 2017. Mainstreaming Climate Change for Sustainable Development in Sri Lanka: Towards a National Agenda for Action - Institute of policy studies Sri Lanka: Institute of policy studies Sri Lanka [WWW Document]. URL http://www.ips.lk/mainstreaming-climate-change-for-sustainable-development-in-sri-lanka-towards-a-national-agenda-for-action/ (accessed 4.30.19).

[11] Ministry of Environment & Natural Resources, 2007. Capacity Assessment and Action Plan for Developing Capacity for Compliance With Global Conventions on Biodiversity, Climate Change, and Land Degradaton.

[12] National Council for Sustainable Development, 2009. National Action Plan for Hatha Lanka Programme.

[13] Climate Change Secretariat, 2012. The National Climate Change Policy of Sri Lanka 1–7.

Achieving inclusive and quality education for all is one of the most powerful and proven vehicles for sustainable development [14]. The government's "Vision 2025" provides the overall vision and the Public Investment Program. The National Budget 2018 focuses on "Blue Green Economy" envisaged to create an eco-friendly environment [15]. The Sustainable Development Act enacted in October 2017 helps to formulate a national sustainable development policy and strategy. The President has appointed the Sustainable Development Council to implement the Act. These initiatives adopted by the Sri Lankan government shapes the socio-political and cultural landscape in which educational policies are developed.

The government also adapted a program on mainstreaming SDGs into institutional plans. Among SDGs, Quality Education (Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all), Climate action, Responsible consumption and production, Industry innovation and infrastructure, sustainable cities and communities are directly integrated with education to address the climate change. This helps Sri Lankan youth to be actively work as sustainable development lead to assist the country progress (UNDP Communications Unit).

Sri Lanka has also developed the National Action Plan for the Haritha (Green) Lanka Program. This plan is the product of the concerted effort of all relevant ministries who actively participated in development programs. Achieving sustainability rests on national efforts to a large extent. Under the National Action Plan following strategies / actions are taken to address the climate change by intergrading it with the education system.

- Identify key subject areas in the curricula of all technical education courses to integrate sustainable production and consumption practices
- Incorporate identified special subject areas in relation to the environmental education for sustainable development to the current syllabuses.
- Take steps to ensure all educational institutions in the general education system to adhere to predefined environmental safeguard policies and ascertain a learner friendly greener environment at the school.
- Integrate physical, ecological and other environmental sensitive policies and practices within the school education system.
- Expand and develop relevant education and awareness programs. [12] (National Council for Sustainable Development, 2009)

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[14] United Nation Development programme, 2019. Goal 4: Quality education | UNDP [WWW Document]. URL https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-4-quality-education.html (accessed 4.1.19).

[15] United Nations, 2019. Sri Lanka, Sustainable Development Knowledge Platform [WWW Document]. URL https://sustainabledevelopment.un.org/memberstates/srilanka (accessed 3.20.19).

In addition, many policies have been implemented over the years to promote Energy Efficiency. For instance, the formulation of a National Climate Change Policy (NCCP) in collaboration with UNDP by the Ministry of Environment in 2012 recognizes the need of implementing strategies for climate change mitigation, technology transfer, financing and investment mechanism, education, training and awareness, monitoring, assessment and management of impact risks due to climate change through a new policy. The importance given by the National Climatic Change Policy to education, training and awareness no doubt influences the Educational Policy Framework already existing in the country.

Bangladesh

It is recognized that Bangladesh is highly vulnerable to climate related disasters such as floods, droughts, tropical cyclones and storm surges, which are worsened due to global climate change. Moreover, Bangladesh is highly populated. Still, consumer behaviour relevant to energy efficiency and climate change related education, training, public awareness issues have not been received the attention in the socio-political and cultural context at the national level of Bangladesh.

Bangladesh is one of the most likely adverse impact countries of climate change while it is one of lowest energy consuming countries of the world. About 89 kgoe/capita energy consumption and 220 kWh/day/person power consumption making the country as the lowest energy consuming nation after Nepal in South Asia. However, the country is identified as fifth among 171 extreme exposure and high vulnerable countries of the world (UNU-EHS, 2016) and first among 162 countries on the basis of the number of people exposed to cyclone, flood and storm surge (UNISDR, 2011). The magnitude, intensity and frequency of natural hazards in the deltaic Bangladesh have increased in past few decades.

In one hand inefficient energy consumption leads to climate change and on the other hand climate change has several negative impacts on energy sector. Thus, it is high time to take initiatives for savings energy for future generation through changing consumer behaviour by incorporating energy efficiency and climate change in course curriculum at primary, secondary and tertiary level of education.

Bangladesh along with the other UN countries of the world set 17 Sustainable Development Goals. Among them, 3 goals (goal 7, 12 & 13) are more or less related to integrated education on consumer behaviour relevant to energy efficiency and climate change. Goal-12: Ensure sustainable consumption and production patterns has 8 targets. Amongst them, target 12.8 focuses on education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment. Goal-13: Take urgent action to combat climate change and its impacts has 3 targets. Amongst them, target 13.3 emphasizes on improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact

reduction and early warning through incorporating the issues into primary, secondary and tertiary curricula.

The Bangladesh Energy Regulatory Commission (BERC) was established in March 2003 which is the apex independent and transparent regulator in the power sector (http://berc.org.bd/). Apart from the other activities, BERC is also empowered to ensure energy efficiency in generation, exploration, production, transmission and distribution levels of the related sectors. BERC has a responsibility for formulating Energy Efficiency & Conservation (EE&C) plan.

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) was formulated in 2009. The action plan is built on six pillars e.g. (i) food security, social protection and health; (ii) comprehensive disaster management; (iii) infrastructure; (iv) research and knowledge management; (v) mitigation and low carbon development; and (vi) capacity building and institutional. The third programme of second pillar is awareness raising and public education towards climate resilience which is a continuing process. BCCSAP creates scope of establishment of a center for research, knowledge management and training on climate change through Ministry of Environment and Forests, research organizations and universities. Bangladesh Climate Change Trust 2010: to make necessary action plan for capacity building for adjustment of the people or groups of people of the affected and risky areas resulting from climate change, upgrading their life and livelihood and facing the long term risk, and to take measures for implementation thereof; and to take measures for adaptation, mitigation, technology development and transfer, capacity building and funds for facing adverse effect of climate change on man, biodiversity and the nature.

Bangladesh Energy Efficiency and Conservation Master Plan (EECMP) up to 2030 addresses to ensure energy efficiency & conservation (EE&C) through education by Ministry of Education and Ministry of Agriculture. Ministry of Education is expected to be in charge of this field and introduce EE&C as one of themes for environmental education. Besides, Ministry of Agriculture will educate irrigation consumers including concerned organizations staffs and introduce renewable energy-based irrigation system in massive scale. The Sustainable and Renewable Energy Development Authority (SREDA) was formed in 2012. Bangladesh Energy Efficiency and Conservation Master Plan states that SREDA should develop the capacity of energy experts through training programs. Besides, our country's social systems should focus on the capacity development for energy experts; such as university curricula, internal training courses in establishments, publication of educational materials and introduction of success experiences from abroad etc.

As per EEC Master Plan, the Government will conduct EE&C school/university program, which will be a joint program with SREDA and Ministry of Education. Educational curricula on efficient use of energy and its conservation for primary, secondary and higher educational institutions, universities or autonomous bodies will be prepared by SREDA, Ministry of Education and related organizations and fixed into their syllabus. The School/university Text Book Board will

review the curricula periodically. The following actions will be adopted in school/university curriculums: (i) exhibition of video clips and documentaries on energy efficiency and conservation practices and their benefits; (ii) organizing spot quiz; (iii) introduction of appropriate posters in schools; (iv) organizing thematic art competition; and (v) motivational talks by experts or professionals.

5.2 Status of education

This section describes that the current state in education on consumer behaviour relevant to energy efficiency and climate change on partner countries and how importance of the education on this field to the three partner countries.

Russian context

There is a significant lack of the information and materials on consumer behavior related to energy efficiency and climate change in the Russian state educational standards in the following areas: “Electroenergy and Electrical Engineering”, levels of bachelor and master [16,17] and “Electro - and heat engineering (Level of training of highly qualified staff)” [18] . The problem of energy efficiency for Russia is extremely relevant, not only at the stage of energy consumption, but also at the stages of its production and transmission. According to the energy efficiency rating, the Russian economy is on the 132-d place from 142 countries of the world. The energy intensity of Russia GDP is twice as high as the world average [4].

At the same time, there are a number of regions and industries in Russia where energy efficiency issues are at the level of world indicators [19]. In the curricula developed in universities in Russia, including ours, based on state educational standards there are modules that provide the consumer behavior related to energy efficiency and climate change. Energy efficiency is considered to be one of the main directions of combating climate change. It is difficult to identify the "climate" potential of individual measures, but it is possible to use integrated classifications reflecting different benefits of energy efficiency to improve policy. This is relevant for Russia, which is in the process of actively shaping climate policy and potentially considers energy efficiency as its Central element.

[16] Federal State Educational Standard of Higher Education -13.03.02 Power engineering and electrical engineering. Approved by order of the Ministry of Education and Science of the Russian Federation of February 28, 2018, No. 144.
[17] Federal State Educational Standard of Higher Education - Master degree in 13.03.02 Power engineering and electrical engineering. Approved by order of the Ministry of Education and Science of the Russian Federation of February 28, 2018, No. 147.
[18] Federal state educational standard of higher education 13.06.01 Electrical and heat engineering (Level of training of highly qualified personnel). Approved by order of the Ministry of Education and Science of the Russian Federation of July 30, 2014, No. 878.
[19] Gasho E.G. The solution to the problem of energy preservation in Russia. Some results and myths / Energy saving. - 2017, № 2.-C. 36-41.

To promote programs related to energy efficiency and climate change, various competitions of youth initiatives, conferences, topics related to the issues of climate action at national and local level, development of renewable energy, role of public in promoting popularization programs in Russian Federation are held.

To implement the sub-programme, the Federal 24/7 hotline on energy saving and energy efficiency has been launched since 2011, in 2012 was transformed into a Contact Center. The Center for Comprehensive Energy Efficiency and Energy Saving of the Ministry of Science and Higher Education (www.energoeducation.ru), conducts training and monitoring the implementation of legislation in the field of energy efficiency, and implements effective energy management systems.

In the period from 2013 to 2014 within the framework of networking with regional universities, the Ministry of Energy of the Russian Federation implemented a large-scale educational project in the field of energy saving and energy efficiency to improve the skills of personnel. The project trained about 20 thousand professionals, public sector work staff throughout the Russian Federation. A similar project was initiated in the framework of the United Nations Development Program (UNDP) Project and the Global Environment Facility (GEF) "Energy Efficiency of Buildings in North-West Russia".

In order to form a lean model of behavior among the population of the Russian Federation, activities are being carried out to develop educational materials and to train according to the developed programs. To ensure the fulfilment of the objectives of these projects, a network of Integrated Training Centers in the field of energy efficiency is used. These centers have been established in all federal districts of the Russian Federation on the basis of leading universities subordinated to the Ministry of Science and Higher Education of Russia.

Sri Lanka

Importance of addressing the climate change identified by all the stake holders engaged with education system. It promotes young people to understand and address the impact of global warming, and encourages changes in their attitudes and behavior changes. It also helps them to adapt climate change-related trends [20] .

Sri Lanka is a highly vulnerable country, the main economical domains and livelihood activities such as agriculture, forestry energy production is directly linked to environment [21].

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[20] WWW.UNESCO.ORG, 2015. Climate Change Education and Awareness [WWW Document]. URL https://en.unesco.org/themes/addressing-climate-change/climate-change-education-and-awareness (accessed 3.26.19).

[21] Sangakkara, S.P., Nissanka, 2011. Global climate change and its impacts on water resources planning and management, Assessment and Challenges.

Currently Sri Lanka has been experiencing frequent climatological, meteorological, and hydrological disasters with the potential to set back agriculture, fisheries and even services such as tourism [22]. The Government has adapted some measures in these fields to promote better environmental management. First and most important of all, lies on education and public awareness. Education has two obvious effects on the fight against climate change. Firstly, it impacts citizens' general awareness of the issue, and secondly, it determines how enabled they are to develop the necessary solutions and innovations to overcome the problem [23].

According to the global statistics, Sri Lanka has not fared well in handling the climate change. In a new global index, Sri Lanka has been ranked second among the countries most affected by extreme weather events in last 20 years since 1998. Therefore, climate change is a major issue of concern for Sri Lanka [23].

When focusing on the emphasis given to consumer behaviour relevant to Energy Efficiency and Climate Change in education, examples can be drawn from the Tertiary Educational landscape of Sri Lanka. Climate change education has to be a major part of the school and university education Number of Universities are now offering subjects and courses based on Climate Change, Disaster management etc. However, at tertiary level education, Climate Change and DRR related issues are Climate change education has to be a major part of the school and university education Number of Universities are now offering subjects and courses [24]. Since these program aims to help people to understand the impact of global warming, and increase "climate literacy" among young people, the strengthening of the capacity to provide quality climate change education by encouraging innovative teaching approaches is much needed. The programmes offered in various educational institutions highlight the importance given to the field in Sri Lanka and the rising numbers of student enrolment reveals that the field remains one of the most preferred disciplines both in Sri Lanka and across the globe. Integration of climate change education in school and by raising awareness about climate change as well as enhancing non-formal education programs through media, networking and partnerships is very important.

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[22] SLCDMP, 2018. Sri Lanka Comprehensive Disaster Management Program 233.

[23] Lionel Wijesiri, 2019. Climate Change awareness through education | Daily News [WWW Document]. URL-http://www.dailynews.lk/2019/01/15/features/174298/climate-change-awareness-through-education (accessed 4.13.19)

[24] Sri Lanka Stakeholder SDG Platform, 2018. SRI LANKA Voluntary Peoples Review - on the implementation of the 2030 Agenda for Sustainable Development.

Bangladesh

Bangladesh is one of the most climate vulnerable countries in the world and will become even more so as a result of climate change. Flood, tropical cyclones, storm surges and droughts are likely to become more frequent and severe in the coming years. However, the concept of consumer behaviuor relevant to energy efficiency and climate has not been introduced in the education sector of Bangladesh to face the upcoming climate change related disasters.

Now, the concept of consumer behaviour relevant to energy efficiency and climate change in the education sector is an urgent need for the Bangladesh. As Bangladesh has an extremely high population density with one of the worst rates of poverty in the world. Therefore, to meet the challenges of climate change related issues, it is important to introduce the concept of consumer behaviour relevant to energy efficiency and climate change to the education of Bangladesh. In addition, capacity building, training, improvement of teacher's qualification on modern study method is vital to achieve high quality education related to climate change.

Education on this field is very important for our country because education is one of the key actors of changing human behaviour. Thus, Government of Bangladesh has given emphasized on training and education on climate change, energy efficiency etc. in our 7th Five Year Plan, Energy Efficiency and Conservation Master Plan (EECMP), BCCSAP 2009, and SDGs.

In Bachelor, Master, MPhil and PhD level the following courses have been offered in different HEIs in Bangladesh i.e. Energy and Environment; Energy Resources Management; Climate Change; Environmental Systems Analysis; Environmental Policy and Governance; Global Climate Change and Processes; Environmental Management; Energy, Environment and Sustainable Development: Bangladesh Perspective; Environmental and Natural Resources Management (ENRM); Climate Change and Land Transformation; Land Utilization; Urban and Rural Land Studies; Environmental Laws, Protocols and Ethics etc.

5.3 Funding

This section is given overview for sufficiency of funding allocation for partner countries on integrated education on consumer behaviour relevant to energy efficiency and climate change at country level.

Russia

Currently energy in Russia is one of the priorities for the development of the Russian economy. The Ministry of Education and Science of the Russian Federation annually on a budgetary basis increases the enrollment of students in the following fields: “Electric Power Engineering and Electrical Engineering”, bachelor and master levels, and “Electrical and heat engineering (Level of highly qualified personnel)”. With the support from the regional Government and duly filled application university receives the requested budget places and the corresponding funding. This allows the university to carry out integrated education in the field of consumer behavior related to energy efficiency and climate change.

- -Insufficient level of budget financing of the state program as a whole, and, as a result, subprogramme activities.
- -Lack of university budget funding for research and development in the field of energy saving and energy efficiency.

Within the framework of various government programs, such as the 5-100-2020 Project, funding is provided for activities aimed at consumer behavior relevant to energy efficiency and climate change, but this amount of money is insufficient. Funding is also provided for a number of European projects, such as Erasmus+ Program of the European Union, ERASMUS+ MARUEEB-master's degree in innovative technologies of energy efficient buildings for Russian and Armenian universities with participation of employers, CBC ENI Russia-Finland: energy-efficient systems based on renewable energy sources for Arctic conditions (EFREA), etc.

Country	Institution	Country level	HEI level
Russia	1. MGSU	Not sufficient	Not sufficient
	2. KSTU	Sufficient	sufficient
	3. SPBPU	Not sufficient	Not sufficient
	4. ASV	Not sufficient	Not sufficient
	5. MSU	Not sufficient	Not sufficient
Sri Lanka	1. UoR	Not sufficient	Not sufficient
	2. UoC	Not sufficient	Not sufficient
	3. UoM	Not sufficient	Not sufficient
Bangladesh	1. PSTU	Not sufficient	Not sufficient
	2. BU	Not sufficient	Not sufficient

Sri Lanka

Education is generally state-funded and offered free of charge at all levels, including the Bachelors' degree level. Sri Lanka currently devotes a comparatively small percentage of its government expenditure towards education. Sri Lanka's public expenditure on education lies between 2-3 % of GDP (2.8 % in 2017) [25]. The General education which includes basic and secondary levels absorbs the largest share of total expenditure followed by higher education, technical and vocational education. The School allocation barely adequate to meet the recurrent expenditure such as teachers' salaries and the cost of expansion of schools to increase the new enrolment rate. The share of expenditure comes on higher education is 14% and 80% of which allocate towards recurrent expenditure with salaries for teachers [6]. Since the sector suffers from severe funding limitations, the administrators are unable to meet entire capital requirements. More allocations are to be diverted to curriculums development, policy making activities, administrative services, infrastructure development facilities, technology upgrading and incorporation, conduct relevant trainings and workshops, teaching material development and many more. To fulfil those requirements HEIs needs sufficient funds

and resources. Due to above mention reasons funding is not sufficient for integrated education on consumer behavior relevant to energy efficiency and climate change at HEIs.
While many International Organizations (such as the United Nations) have provided various institutions with funding to promote Integrated Education on Consumer Behaviour relevant to Energy Efficiency and Climate Change, there remains a distinct gap between the funds available and the lack of climate and energy literacy among the people, as most funds cater to key institutions, polarizing the funds around a few, resulting in others experiencing lack of opportunities and infrastructure to promote integrated education.

Bangladesh

The Bangladesh Climate Change Resilience Fund (BCCRF) is one of the donors financed funding windows in Bangladesh the BCCRF has been established with an amount of US$110 million. The BCCRF was created in 2010 with the intention to support the BCCSAP and provide funding for climate change management, primarily adaptation but also mitigation.

Besides, The Government of Bangladesh has established Bangladesh Climate Change Trust Fund (BCCTF) with its own resource by allocating about US$100 million in 2009-10. A similar amount has been budgeted for FY 2010-11 as well. The main research areas of BCCTF are: food security, social protection and health, comprehensive disaster management, infrastructure, research and knowledge development, and mitigation and low carbon development.

Another funding window is the Strategic Programme for Climate Resilience (SPCR) through the Climate Investment Funds (CIFs) at the World Bank, and DFID being the major source of funding. But these funding are not sufficient for integrated education on consumer behaviour relevant to energy efficiency and climate change. In the context of country wide incorporation of the concept at university course curriculum requires integrated education plan and policy, more funding for research and innovation as well as organizing national level seminar, symposium, campaign etc. In addition, lack of university funding is repoted for R&D and particularly for the field of consumer behaviour, energy savings and energy efficiency.

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[25] Knoema, 2018. Sri Lanka Public spending on education as a share of GDP, 1960-2018 - knoema.com [WWW Document]. URL https://knoema.com/atlas/Sri-Lanka/topics/Education/Expenditures-on-Education/Public-spending-on-education-as-a-share-of-GDP (accessed 3.22.19).

5.4 Educational needs

This section is assisted to identify the needs in integrated education on consumer behaviour relevant to energy efficiency and climate change in partner countries.

	Educational needs
Russia	1. Creation of an information system 2. Introduce the course "Fundamentals of energy conservation" in all higher and secondary specialized educational institutions. 3. The introduction of energy efficiency standards, mandatory building codes and regulations, planned indicators associated with the use of highly efficient energy-saving and environmentally friendly technologies for the consumer. 4. Interconnection of energy efficiency and climate change for the energy consumer. 5. Implementation and broadcasting of European experience and practices 6. Raising public awareness 7. Build capacity of the student's internet community 8. Creation laboratory facilities for studying 9. Conducting training sessions, scientific seminars 10. Teaching staff training 11. Integration of relevant courses into curriculums 12. Institutional support on universities management level is required 13. Institutional support on Ministry of Higher Education level is required 14. In schools, instruction should be integrated in separate blocks and included in the GEF subjects. 15. In higher education institutions, the problems of energy-efficient and climate-friendly behavior should be taught in separate disciplines, or integrated in existing subjects
Sri Lanka	1. Energy budgeting and conservation strategies 2. Green thinking and Energy options (Internal and External energy concentration) 3. Capacity building towards energy and behavioral options 4. Create effective education platform for both students and professionals. 5. Develop new University Industry collaboration platforms 6. More scientific knowledge. 7. Need of identifying research on this field 8. Establishing a strong network among various stakeholders. 9. More involvement of Educational and Research Agencies on research that focus on the physical and socio-economic dimensions of Climate Change and Energy Efficiency.

Bangladesh	1. Upgraded curricula 2. Practice of modern learning, teaching tools and methodologies which are now being used in Europe. 3. Quality training, awareness and development of teacher's capacity and strength. 4. Scientific network among universities to enhance the strength of integrated education. 5. Capacity building of the institutes and staffs. 6. To incorporate the process in national development planning and strengthen public private participation 7. To facilitate people to go to renewable energy use from non-renewable energy

5.5 Educational Gaps

This section is assisted to identify the Gaps in integrated education on consumer behaviour relevant to energy efficiency and climate change in partner countries at country level.

	Educational Gaps
Russia	1. Low level of population awareness 2. The lack of qualified personnel in the policies related to this area 3. The unsatisfactory state of the fuel control and accounting systems and energy consumption. 4. Gaps in dialogue with population and formation of public opinion: Coordination and information exchange 5. Legislative framework and Federal target programs development 6. Creation and implementation of short-term and long-term plans 7. Area of adaptation to climate change: Conducting research 8. Increasing public financial and institutional support 9. Adoption of national and regional climate change programs 10. Developing new and supporting existing education programs 11. Lack of institutional framework for introducing such education 12. Lack of teaching staff 13. Lack of funds 14. Lack of courses for related areas 15. Lack of knowledge in climate change among students 16. The lack of incentive mechanisms for consumers. 17. Conducting scientific investigation to identify the economic consequences 18. Lack of motivation 19. The lack of a general system of propaganda 20. Insufficient use of the media to promote the benefits of energy-saving business style 21. Limited use of Internet technologies.

Sri Lanka	1. Lack of expertise and Scientific Knowledge. 2. Lack of research on Climate Change. 3. Lack of networking among key stakeholders. 4. Lack of prioritization of Climate Change and Energy Efficiency by Education and Research Institutions 5. Lack of available funding and resources 6. Barrier in administration support in managing Research and development activities in HEIs. 7. Issues on policy planning and implementation and evaluation procedures in education system 8. Inadequate technical capacity of HEIs 9. Lack of initiatives to develop new programs and curricula for capacity building of academics and students 10. The uneven quality of and access to education 11. quality is not high enough to satisfy the demands of the domestic industry 12. Low level of public awareness 13. low international exposure
Bangladesh	1. Lack of capacity on participatory, experimental, and inclusive teaching and learning methodologies. 2. Lack of quality training facilities. 3. Education, training and public awareness issues relating to climate change. 4. Modern quality education requirements and stakeholder needs. 5. Dissemination of information at national level. 6. lack of specific policy. 7. Lack of research funding 8. Lack of specific course curriculum/module 9. Lack of available data.

6 POLICY AND PLANNING

The gaps in policy planning have also been highlighted focusing to an integrated curricular development and integrated functionality of relevant institutions. Specifically, it is mentioned that the modern learning and teaching techniques should be brought to the academia and implant within the users via capacity building programs and postgraduate courses.

Russia	1. Creation of department branches at the leading organizations and enterprises of the industry with the focus on consumer energy efficiency. 2. Organization of the step by step implementation of integrated education of bachelors, masters and doctors of science on the problem of consumer behavior related to energy efficiency and climate change as part of the educational process. 3. Involvement of students in course projects and final qualification works related to the end - consumer energy efficiency and climate change. 4. Organization of classes for advanced training conducted by the university for energy specialists, on the behavior and role of the consumer in problems solving related to energy efficiency and climate change. 5. Implementation European educational practices to existing educational programs 6. Organization internships for teaching staff and students 7. Social aspects of consumer behavior management
Sri Lanka	1. The process of policy implementation is weakened due to insufficient allocation of funds for educational policy 2. Mismanagement of the resources at administrative level 3. Gaps in evaluation procedure of education policies and reviewing or updating 4. The lack of lateral coordination between ministries 5. Training and development initiatives for research and innovation have not incorporated to national level policies. 6. Low interactions among institutions 7. Energy efficiency is not a priority area in the current higher education system 8. The state universities of the county don't have way of enrolling student's directly 9. Gaps in selection procedures and policies when selecting students to HEIs 10. Gaps in policies on E-based learning — Vocational education Standardize private education — Smart classroom

Bangladesh	1. At present in HEI, education should be considered keeping the views of climate change related issues along with energy efficiency. 2. Besides, curricula should be integrated with energy efficiency and climate change. 3. Modern learning, teaching tools and methodologies should be considered at HEI to develop the socio-economic condition. 4. Need of an individual department/discipline

7 CAPACITY TYPES

This section aims at assessment of the existing state of capacities in the HEI for integrated education on consumer behaviour relevant to energy efficiency and climate change. As defined by the CAPNAM analytical framework, the four types of categories are institutional, organizational, individual, and the knowledge base.

7.1 Key facts and figures about the partner HEIs

Country	Institution	No of students	No of academic staff	St / Ac. staff ratio	No. of faculties	No. of graduates	No. of study programs	No. of academic Partners	International rankings
Russia	1. MGSU	11548	867	13:1	6	135000	75	92	QS BRICKS Rankings (199)
	2.KSTU	12000	840	14:1	15	20000	124	87	195 Qs
	3.SPBPU	31000	6000	11:1	11	2000+	460	340	QS Global World Ranking: #404
	4.ASV								
	5. MSU	38150	9390	4:1	40	7800	18 (Fac. Econ.)	215	QS 90 – by reputation
Sri Lanka	1.UoR	9201	546	17:1	10	2300	40	70	2701 (webometrics)
	2.UoC	25000	700	36:1	9	2633	185	76	2226 (webometrics)
	3.UoM	9742	428	23:1	5	1518	20	-	2708 (webometrics)
Bangladesh	1. PSTU	3500	226	15:1	2	2945	-	8	4409 (webometrics)
	2. BU	7593	200	38:1	2	4000	2	2	15668 (webometrics)

7.2 Strategic priorities

Current context of strategic priorities given to integrated education on consumer behaviour relevant to energy efficiency and climate change at HEI level.

Country	Institution	Strategic priorities
Russia	1. MGSU	No
	2.KSTU	Yes. The development of energy in the region is a strategic priority.
	3.SPBPU	Yes. The main strategic priority of HEI is integration teaching modules on consumer behavior relevant to energy efficiency and climate change into existing educational programs of the different levels of studies
	4.ASV	No
	5. MSU	No special priorities
Sri Lanka	1.UoR	Yes. Since the Agriculture Sector is more vulnerable to disasters, Faculty of Agriculture redesigned degree programs and courses to address the Climate change and mitigation issues
	2.UoC	No
	3.UoM	No
Bangladesh	1. PSTU	Not directly
	2. BU	lack of strategic priorities

7.3 NEEDS at HEI in integrated education on consumer behavior relevant to energy efficiency and climate change

Under the aspects of needs for an integrated education on consumer behavior the requirement of capacity building programs, scientific networking and use of European academia practices and financial support for the mentioned training programs and research and infrastructure development have been highlighted.

Russia	1. Development of the educational system 2. Development on new course modules on this area and implement to curricular, e-learning courses and MOOC 3. Environmentally friendly technologies for the consumer in training courses 4. The need to finance scientific research on the use of distributed energy and renewable energy sources 5. The need to assess the relationship between energy efficiency and climate change for consumers in training courses 6. Increasing consumer's responsibility of students 7. Organization of special open activities 8. Generic competence 9. Teaching staff training 10. Development of curricular

	11. Integration into curriculums 12. Institutional support on universities management level 13. Institutional support on Ministry of Higher Education level 14. Increasing the interdepartmental cooperation in education and research
Sri Lanka	1. Proper support from government and educational stakeholders 2. Develop new programs and curricula for education on consumer behavior relevant to energy efficiency and climate change 3. Develop training programs for academic and technical staffs and students on capacity building on use of new technology 4. Develop new partnerships with industry and stakeholders to accelerate learning and increase knowledge creation by enhance the university industry collaboration. 5. Development of Infrastructure facilities in HEIs 6. Platforms for conducting research 7. Funding prioritizing the different facets of consumer behaviour relevant to energy efficiency and climate change 8. Understand the necessity of environmental protection 9. Learn to observe the changes taking place in the environment 10. Evaluate the impacts of their own consumption 11. Adapt their behaviour to support sustainable development. 12. Familiar with the main aspects of the ecological, economic, social and cultural dimensions of sustainable development
Bangladesh	1. Upgraded curricula 2. Practice of European modern learning, teaching tools and methodologies 3. Quality training, awareness and development of teacher's capacity and strength. 4. Scientific network among universities to enhance the strength of integrated education. 5. Sufficient research funds and capacity building of the institutes and staffs 6. To contribute in producing quality energy expert to serve the nation 7. To help in disseminating the knowledge 8. To be a part of national planning and development process

7.4 GAPS at HEI in integrated education on consumer behavior relevant to energy efficiency and climate change

The gaps that exist in integrating the education on consumer behavior are mainly concentrated on insufficient capacity to initiate awareness programs and insufficient technical capacity to design a uniform curriculum. Further, it has been mentioned that the partnerships and

networking among the partners to be identified as insufficient to develop a common agenda for the implementation of integrated education system.

Russia	1. Preparation of materials and examples for mass media 2. Insufficient state of education with school students 3. Uniform curricular design methodology required 4. Integration of European best practices and cases 5. The culture of energy efficiency and climate change not enough developed 6. support of the student's projects 7. lack of relationships with business partners and stakeholders. 8. Lack of institutional framework for introducing such education (no generic competence) 9. Lack of teaching staff 10. Lack of funds 11. Lack of courses for non-related areas 12. Lack of knowledge in climate change among students 13. Advanced training programs for energy profile specialists conducted by the institution 14. No separate subjects
Sri Lanka	1. Lack of available funding and resources 2. Lack of trained professionals who are specialized in these subject areas 3. Technical capacity of HEI is not sufficient 4. Lack of Motivation to academic and non-academic staffs and students for these subject areas 5. Lack of a substantial inter-agency coordination mechanism Lack of institutional support for Strategic Planning and Management of HEI 6. Lack of courses designed 7. Lack of experts specialized professionals 8. The provision for credit transfer is not recognized as an option for students to go for different directions. 9. HEIs have not given the opportunity to enroll students and hence, there is a very little chance of absorbing international students.
Bangladesh	1. Lack of capacity on participatory, experimental, and inclusive teaching and learning methodologies. 2. Lack of quality training facilities. 3. Education, training and public awareness issues relating to climate change. 4. Modern quality education requirements and stack holder needs. 5. Dissemination of information at national level 6. Lack of course/module;

7. Lack of trained manpower;
8. Lack of funds
9. Lack of data
10. Lack of policies

8 ORGANIZATIONAL CAPACITIES

8.1 NEEDs at HEI related to organization of study process

The need for organizational capacities to organize a study process has been identified mainly on the need for capacity building in the academia with integrated training programs and awareness raising programs. Further, it has been mentioned to develop the infrastructure systems in align with the European practices and techniques

Russia	1. Creating information and educational system 2. Development of several modules 3. Development of training courses 4. Conducting research 5. the hierarchical coordination in curricula and organization of the educational process 6. European practices in the field of energy efficiency and climate change 7. Organization implementing projects of representatives from industries lectures 8. Increase of awareness about European studies 9. Organization student's mobility programs 10. Organization of short termed winter and summer schools' programs 11. Generic competence 12. Teaching staff training 13. Integration into curriculums 14. Institutional support on universities management level 15. Institutional support on Ministry of Higher Education level 16. The curricula and work programs of disciplines for students
Sri Lanka	1. Support from government and educational stakeholders 2. Develop training programs for academic and technical staffs on capacity building 3. Allocate sufficient budget for HEIs for research and innovation activities 4. Implement policies to support HEIs for researches and capacity building strategies for academics 5. Development of infrastructure facilities 6. Approval to offer courses on the topic from tertiary educational bodies and committees within the university and the University Grants Commission 7. Clear university rules and regulations to offer courses to all internal and external students 8. Costs attached to offering and maintaining the course 9. Online Platforms to offer the programme 10. Technical knowledge for organization of MOOCs

Bangladesh	1. Upgraded curricula 2. Practice of European modern learning, teaching tools and methodologies 3. Quality training, awareness and development of teacher's capacity and strength. 4. Scientific network among universities to enhance the strength of integrated education. 5. Capacity building of the institutes and staffs. 6. Establish modern multi-disciplinary courses 7. strengthen educational and scientific collaboration as well as networking with partner universities

8.2 GAPS at HEI related to organization of study process

The main gap that has been identified as oppose to the needs as mentioned above is the absence of strong institutional framework and regulatory support for the implementation of academic programs and required infrastructure development.

Russia	1. The better equipment of laboratory and demonstration facilities for the research 2. Organization of classes for advanced training 3. Development of materials and examples for the media 4. Organization of special trainings for the students 5. Creation of a specialized audience 6. Integration European best practices and cases 7. Student's motivation for making research 8. Lack of institutional framework for introducing such education 9. Lack of teaching staff 10. Lack of funds 11. Lack of courses for non-related areas 12. Lack of knowledge in climate change among students 13. Does not have a separate scientific direction on climate change 14. The collaboration between departments of MGSU is not held on this subject.
Sri Lanka	1. Lack of technical capacity of the HEI 2. Lack of academic professionals in this subject area 3. Lack of funding and infrastructure facilities 4. Lack of organizational policies and management strategies 5. Lack of university industry collaborations 6. Poor attention given on these area by the industry 7. Demand for these knowledge areas in the job market is low 8. Unavailability of state of the art knowledge in local context

	9. Lack of rules and regulations to offer courses to all internal and external students 10. Lack of online platforms 11. Lack of modern, up to date resources
Bangladesh	1. Lack of capacity on participatory, experimental, and inclusive teaching and learning methodologies. 2. Lack of quality training facilities. 3. Education, training and public awareness issues relating to climate change. 4. Modern quality education requirements and stack holder needs. 5. Dissemination of information at national level 6. Absence of available MOOC modules 7. Lack of modern multi-disciplinary courses 8. Insufficient educational and scientific collaboration 9. Lack of access to Simulated Big Data Interuniversity Network

8.3 Individual capacities: Staff skills

This part describes the individual staff capacities pertinent to integrated education on consumer behaviour relevant to energy efficiency and climate change at HEI.

8.3.1 Academic staff work at institution

Country	Institution	Academic staff at Unit	Staff - University level		Researchers	
			Uni.	Fac/Dept.	Uni.	Fac./Dept
Russia	1. MGSU	81	40	-	30	-
	2.KSTU	4	12	6	12	6
	3.SPBPU	90	8	3	10	5
	4.ASV					
	5. MSU	4	20	8	14	5
Sri Lanka	1.UoR	64	95	20	125	25
	2.UoC	5	5	2	5	2
	3.UoM	5	10	3	4	2
Bangladesh	1. PSTU	6	26 0	0	0	0
	2. BU	5	8	5	-	-

8.3.2 The current state of the staff training on consumer behavior relevant to energy efficiency and climate change

Country	Institution	Trainings	Flexibility in designing its own skill development plans
Russia	1. MGSU	Not Sufficient	There are both opportunities for teachers to develop their skills.
	2.KSTU	Sufficient for implementing the project	Faculty members have the freedom to develop their own skills development plans.
	3.SPBPU	Not Sufficient	The flexibility of the academic staff is quite limited by the centrally determined package.
	4.ASV		
	5. MSU	Not Sufficient	Academic staff has a flexibility in choosing training programs.
Sri Lanka	1.UoR	Not Sufficient	The staff has the flexibility and capability to initiate the skill development program
	2.UoC	Not Sufficient	The university provides ample space for the academic staff to develop their own skills
	3.UoM	Not Sufficient	Possible, however, less attention has paid since there is no recognition given for those.
Bangladesh	1. PSTU	Not Sufficient	Yes. All academic staffs have flexibility in designing their own skill development plans. In addition, University also has central packages for improving staff capacity and skill.
	2. BU	Not Sufficient	Yes, academic staff have flexibility in designing its own skill development plan.

8.3.3 Staff stability and Turnover of professionals

Country	Institution	Staff stability and Turnover of professionals
Russia	1. MGSU	Staff is stable
	2.KSTU	There is no staff turnover.
	3.SPBPU	Staff is stable enough.
	4.ASV	Staff is stable
	5. MSU	Low staff turnover
Sri Lanka	1.UoR	There is staff stability, No high turnovers
	2.UoC	There is staff stability
	3.UoM	Staff is stable
Bangladesh	1. PSTU	Having staff stability
	2. BU	Yes, there is staff stability and no high turnover

8.3.4 Required Skills for integrated education on consumer behaviour relevant to energy efficiency and climate change

Russia	1. Appropriate education 2. Diligence 3. Active participation in research 4. Teamworking 5. Project management skills. 6. Knowledge of the European experience and practices 7. Practice of the European cases integration into curricular. 8. Interdisciplinary up to date knowledge 9. Presentation skills 10. Innovative teaching methods (case studies) 11. Skills in digital economy (big data, AI, machined learning) 12. Multidisciplinary knowledge 13. Skills on problem base learning 14. Skills on urban studies based on scientific approach 15. Theoretical skills on the topic 16. Skills to use special software.
Sri Lanka	1. Skills on teaching abilities and Learning methods 2. Patience, adaptability and mentoring skills 3. Communication and presentation skills 4. Technical knowledge, skills and capacity building 5. Group facilitation techniques, leadership and organizatinal skills 6. Research opportunities 7. IT skill 8. Teamwork and Leadership 9. Creativity and Problem Solving 10. Information Usage and Management 11. Adaptability and Flexibility
Bangladesh	1. Training and workshop. 2. Communication skills 3. Presentation skills. 4. Data management. 5. Group work. 6. Curriculum/module development skill 7. Motivational skill 8. Innovation skill 9. Ability to continue the effort 10. ICT skill

8.4 Access to Information, Knowledge and Technology

Access to information, knowledge and technology are becoming increasingly critical for sustaining long-term growth and development of education. It relates to the capacity to enable academic staff and students to mobilize, access and use information and knowledge, including access to and effective use of interne.

Country	Institution	Printed learning materials		Online materials		MOODLE	Software
		National language	Other language	National language	Other language		
Russia	1. MGSU	yes	yes	yes	yes	yes	yes
	2.KSTU	Yes	yes	Yes	Yes	Yes	Yes
	3.SPBPU	Yes	yes	Yes	Yes	Yes	Yes
	4.ASV	Yes	Yes	Yes	Yes	Yes	Yes
	5. MSU	Yes	Not enough	subscription to bases	Not enough	Yes	No
Sri Lanka	1.UoR	yes	yes	Yes	Yes	Yes	Yes
	2.UoC	yes	yes	Yes	Yes	Yes	No
	3.UoM	No	No	No	Yes	Yes	No
Bangladesh	1. PSTU	Yes	Yes	Yes	Yes	No	No
	2. BU	No	Yes	No	Yes	No	No

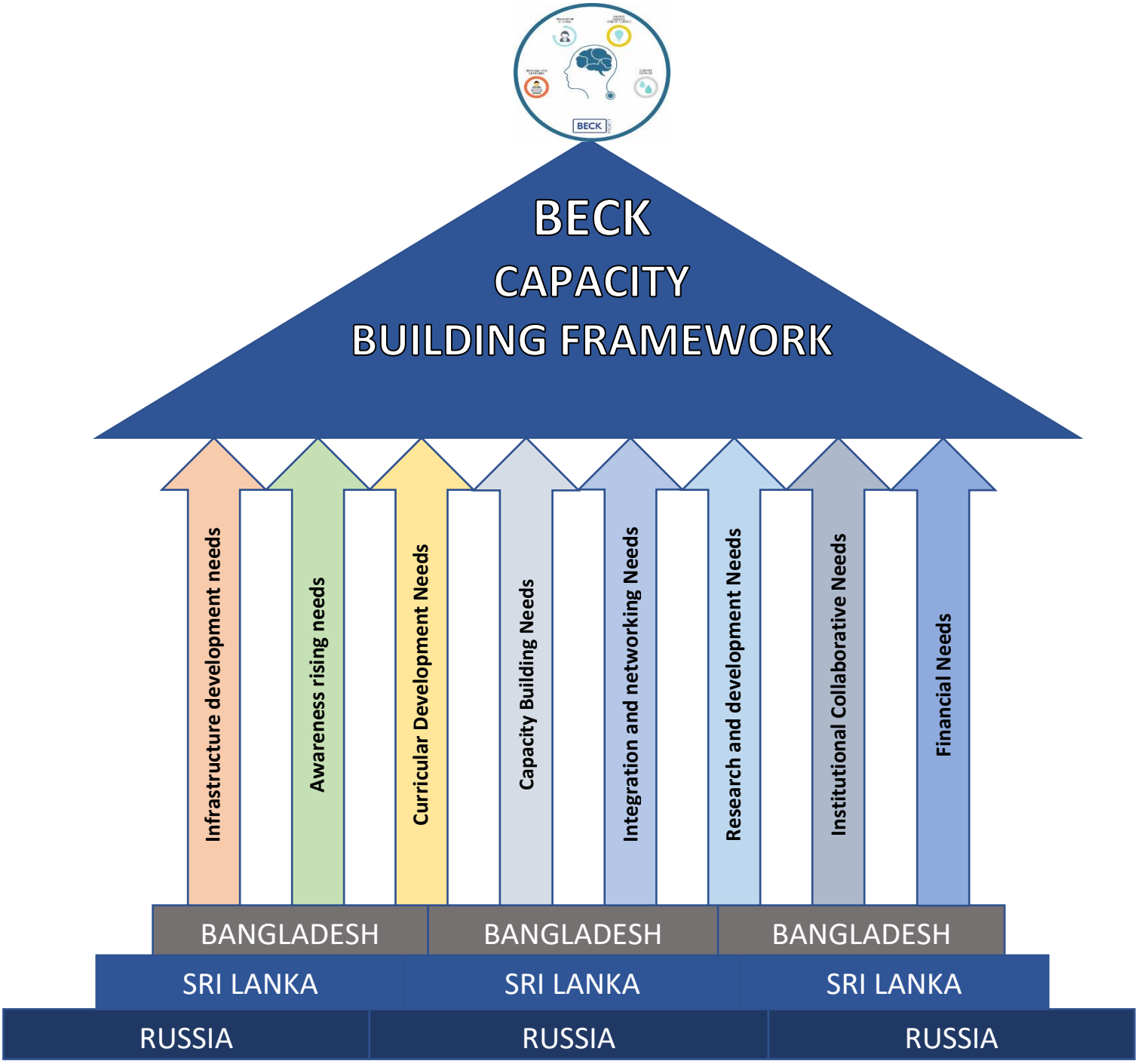
8.4.1 Information/Knowledge/Technology is required for integrated education on consumer behaviour relevant to energy efficiency and climate change

Russia	1. Implementation of modern information-educational environment 2. It is necessary to prepare a large number of educational materials 3. Programs to upgrade the English proficiency skills of teachers. 4. It is necessary to introduce computer intellectual systems, computer learning systems, big data intellectual analysis for educational purposes 5. MOOCs courses with possibilities of integration into existing educational programs. 6. Exchange of knowledge and information between teachers 7. International interaction between students on this area 8. Development of laboratory facilities and software. 9. Subscription to case studies and simulators, Big Data mining 10. Information on the positive experience of teaching 11. Social studies
Sri Lanka	1. Support from educational stakeholders 2. Development of new programs 3. Develop training programs for academic and technical staffs and students on capacity building on use of new technology 4. Allocate sufficient budget for HEIs for research and innovation activities 5. Develop new partnerships with foreign universities and organizations for share knowledge and technologies for capacity building activities. 6. Awareness programs should be arranged not only for the students but also for the public 7. Proper education to Change people's attitude. 8. Energy economics, Theory of utility and choice theory, welfare economics 9. Technical and academic knowledge 10. Research expertise. 11. Technological equipment. 12. Network among key stakeholders. 13. Awareness raising
Bangladesh	1. Online open sources MOODLE 2. Sufficient support and access 3. Free access to the resources 4. Access to printed and online learning materials 5. Trained staff 6. Energy efficiency technology 7. Access to the big data network

8.4.2 Gaps in access to information, knowledge and technology pertinent to integrated education on consumer behaviour relevant to energy efficiency and climate change

Russia	1. Low level of proficiency in foreign languages, both students and teachers. 2. Insufficient use of modern educational methods and tools 3. Insufficient material support and the provision of modern program-based tools 4. A low basic level of education in the field of energy preservation, 5. Lack of trained specialists in this field 6. The complexity of registration and access to foreign databases of educational resources in foreign languages. 7. Number of thematic MOOCs courses should be raised. 8. Existing curricula are not accompanied by information materials. 9. European best practices and cases are not used enough in the learning process. 10. Technical equipment of training programs should be updated.
Sri Lanka	1. Poor knowledge and skills in ICT 2. Lack of fluency in English language 3. Unequal access for Internet 4. Poor bandwidth 5. Inadequate training opportunities 6. Lack of human resources 7. Lack of technologies 8. An organized approach and framework for knowledge and research contribution. 9. Lack of manpower. 10. Lack of educational policy frameworks. 11. Technical capacity of HEI not adequate 12. Lack of trained professionals 13. Lack of funding and infrastructure facilities 14. Lack of motivation to academic/non-academic staffs/ students 15. Lack of communication in inter and intra institutional level 16. Lack of access to data sources for research and innovation activities
Bangladesh	1. Lack of knowledge 2. Lack of training and workshop 3. Transfer of technology and methodologies 4. Absence of printed and online learning materials 5. Lack of research fund 6. Absence of big data network 7. Inadequate trained staff

9 BECK CAPACITY BUILDING FRAMEWORK



Infrastructure Development Needs

- Creation of an information system
- Lack of quality training facilities and uneven access to education
- Modern learning, teaching tools and methodologies to be focused on socio economic development
- Development of infrastructure facilities
- Lack of quality teaching and training facilities
- Information Usage and Management
- Implementation of modern information-educational environment along with computer intellectual systems, computer learning systems, big data intellectual analysis
- Development of laboratory facilities and software
- Material support on modern program-based tools

Curricular Development Needs

- Upgrade the curricula on energy efficiency standards
- Integration of curricula with energy efficiency and climate change
- Curricular improvement incorporating European educational practices
- Gaps in the higher education system with low priority for energy efficiency and climate change and student involvement in related course projects
- Development of new course modules, curricular, e-learnings courses and MOOC
- Need of aligning secondary and tertiary education systems
- Technical capacity improvement in curricular development
- Uniform curricular design methodology and adaptation of European best practices
- Lack of quality training facilities and trained professionals
- Upgraded curricula and online offering platforms
- Practice of European modern learning, teaching tools and methodologies
- Development of new programs
- Energy economics, Theory of utility and choice theory, welfare economics
- MOOCs courses with possibilities of integration into existing educational programs
- Existing curricular to be upgraded by technical equipment, training programs and information materials

Integration and networking Needs

- Scientific network among universities and related institutions
- Organization internships for teaching staff and students
- Lack of inter and intra coordination among ministries and mismanagement of resources
- Scientific network among universities to enhance the strength of integrated education especially European learning and teaching methods
- Lack of partnerships with business partners and stakeholders for strategic planning and management of HEI
- Student mobility programs and intensive school programs
- Scientific network among universities to enhance the strength of integrated education.
- Integration European best practices and cases along with industrial collaborations
- Interdisciplinary up to date knowledge
- Innovative teaching methods and European practices
- New partnerships with foreign universities and organizations for share knowledge and technologies

Awareness Raising Needs

- Raise academic awareness on energy conservation and energy budgeting
- Low level of exposure and awareness in public domains including coordination and information exchange
- Lack in prioritization in Climate Change and Energy efficient systems
- Awareness on user behaviors and consumption
- Education, training and public awareness issues relating to climate change
- Awareness programs for both students and public

Capacity Building Needs

- Develop training programs for academic and technical staffs on capacity building and research
- Lack of capacity on participatory, experimental, and inclusive teaching and learning methodologies
- Project management skills
- Skills in digital economy (big data, AI, machined learning)
- Develop training programs on capacity building regarding the use of new technology
- Programs to improve the English proficiency of academic staff and attitude of general public
- Lack of knowledge on integrated education on consumer behaviour relevant to energy efficiency and climate change

Research and development Needs

- Research and development programs along with training and awareness development
- Lack of capacity in educational systems including research, learning and teaching techniques
- Platforms for conducting research
- Appropriate education and research opportunities
- Facilitate with sufficient resources for research and innovation activities
- An organized approach and framework for knowledge and research contribution.

Institutional Collaborative Needs

- Institutional support on research development and product delivery
- Lack of institutional engagement and legislative framework for research and development programs
- HEI management and student enrollment
- Policy level training and development initiatives for research and innovation, implementation and evaluation
- Institutional and stakeholder support
- Support from government and educational stakeholders in terms of scientific networking
- Lack of institutional framework and regulatory support to offer courses to all internal and external students
- Lack of organizational policies, management strategies and training
- Dissemination of information at national level

Financial Needs

- Lack of funds and financing resources
- Insufficient allocation of funds
- Financial support and platforms to conduct research and development
- Allocate sufficient budget for HEIs for research and innovation activities
- Lack of funding and infrastructure facilities

BECK TEAM

Partner	Name of the Partner	Status	Name of the member
P1	Vilnius Gediminas Technical University (VGTU), Lithuania.	Professor	Artūras Kaklauskas
		Professor	Audrius Banaitis
		Assoc. Professor	Laura Tupėnaitė
		Dr	Arūnė Binkytė-Vėlienė
P2	University of Huddersfield (UoH), UK.	Professor	Dilanthi Amaratunga
		Mr	Malith Senevirathne
P3	Tallinn University of Technology (TalTech), Estonia.	Professor	Irene Lill
		Assoc. Professor	Emlyn David Qivitog Witt
P4	Moscow State University of Civil Engineering (MGSU), Russia.	Mr	Stefan Shvedov
		Dr	Nina Danilina
		Dr	Andrey Rymarov
P5	Kaliningrad State Technical University (KSTU), Russia.	Dr	Elena Gordeeva
		Dr	Andrey Nikishin
		Dr	Maxim Kharitonov
P6	University of Ruhuna (UoR), Sri Lanka.	Professor	Champa Madhumathi Navaratne
		Professor Emeritus	Nandasiri Weerasinghe
		Mr.	HA Chamila Priyankara
P7	Alma Mater Studiorum – University of Bologna (UNIBO), Italy.	Professor	Marco Pretellii
		Professor	Ernesto Antonini
		Dr	Tommaso Rovinelli
P8	Peter the Great St. Petersburg Polytechnic University (SPbPU), Russia.	Mrs	Elena Nikonchuk
		Dr	Alla Mazina
		Dr	Marina Petrochenko
P9	International Public Organization of Assistance to Construction	Dr	Vladimir Andreev
		Dr	Zinaida Ivanova
P10	M. V. Lomonosov Moscow State University (MSU), Russia.	Professor	Vladimir Echenique
		Assistant professor	Maria Ulyanova
			Boris Denisov
P11	Patuakhali Science and Technology University (PSTU), Bangladesh.	Professor	A.K.M. Mostafa Zaman
		Md	Abubakkor Siddik
		Md	Ashiqur Rahman
P12	University of Colombo (UoC), Sri Lanka.	Dr	Nishara Fernando
		Professor	Lasantha Manawadu
		Ms.	Deeya Gahage Nedha Thiwanka
P13	University of Barisal (BU), Bangladesh.	Dr	Dhiman Kumer Roy
			Abu Jafor Mia
			Sukhen Goswami
			Mohammed Risalat Rahiz
			Md Ilias Mahmud
P14	University of Moratuwa (UoM), Sri Lanka.	Professor	Rangika Halwatura
		Mrs	Anuradha Peramunugamage
			Wasuda Aberathne
			Anupama Gunawardana