



TERMS OF REFERENCES
FOR CURRICULUM
DEVELOPMENT, RESEARCH
TRAINING AND STAKEHOLDER
COOPERATION ARRANGEMENTS
UNDER THE ERASMUS+ CBHE PROJECT SUNRAISE



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1. INTRODUCTION

Terms of References for curriculum development, the framework for research training and for stakeholder collaboration arrangements have been developed in order to facilitate the development of SUNRAISE project deliverable, to ensure that they adhere to SUNRAISE working plan, and to confirm its relevance. In particular ToRs aim at matching policy relevance, labor market demands and innovative character with capacities and strategic objectives of partner higher education institutions.

ToRs have been developed as a result of painstaking collaborative process involving various methods, such as surveys, capacity reviews, interviews, and participation of external experts in actual in-class work in partner countries. However most of all it is based on iterative process that included multiple discussions and feedback exchange with academic faculty at partner countries, but also with representatives of stakeholder circles, such as employers (state agencies, protected areas, local communities, NGOs, companies, research centers) as well as representatives of public bodies and opinion makers, who shared their foresight and understanding of current trends in national environmental and educational policies. Such a complex approach was needed due to highly multidisciplinary nature of the issues addressed by the project and its curricula – sustainability of the Arctic and highly mountainous areas, which are among the most exposed and vulnerable ecosystems, but also are homes to a diversity of particular socioeconomic issues, such as marginality as well as endangered local communities and practices.

The work on the ToRs has been coordinated by Erda RTE (the Netherlands) that was subcontracted for this task. However it also includes multiple contributions by all the SUNRAISE partners who participated in data collection and discussion of outcomes, and also facilitated field work as well as interactions with staff and external stakeholders. Erda RTE has maintained some works on the document event after the contract has been completed on October 1, 2018, and made any necessary amendments reflecting various developments and preferences expressed by stakeholders and project participants in the course of the project.

The first draft of the ToRs has been presented in September 25, 2018 at SUNRAISE meeting in St.-Petersburg, Russia. Multiple feedback received on this meeting has been integrated in the next version that was, in its turn, discussed with partner country (PC) representatives face-to-face, as well as on stakeholder meetings. The final version was made available on October 9, 2018, and then it was multiply amended on the request of the contracting party.

The ToR consists of the following sections:

- Proposed and agreed curriculum contents with justifications and references to key meetings where the contents have been discussed, as well as proposed and agreed forms of curriculum development (new or revised courses) based on institutional capacities and sustainability options;
- An outline of the proposed and agreed structure of the research framework and related informational infrastructure.

2. CURRICULUM CONTENTS

2.1. METHODOLOGY

The initial list of SUNRAISE curricula has been established through end-user surveys (<http://sunraise.sfu-kras.ru/results/end-user>) organized by SUNRAISE partners with a support from Erda RTE. This list has been used when discussing curricula with the academic faculty and stakeholders on a series of events, as well as individual and small group face-to-face meetings. The events involving faculty discussions and stakeholder consultations included (both attended and studied using minutes and/or recordings):

- 21 February 2018 - SUNRAISE regional stakeholder workshop in Gorno-Altai, Russia.
- 12-13 March 2018 - SUNRAISE Russia's Start-up Seminar and stakeholder workshop in St.-Petersburg (RSHU);
- 18 May 2018 - SUNRAISE stakeholder workshop at JNU in New Delhi;
- 21 May 2018 - International Stakeholders' Workshop at UGC-HRDC, Kumaun University, Nainital, India;
- 22 May 2018 - SUNRAISE stakeholder consultations in Nainital, India;
- 28 May 2018 - Stakeholder-academia workshop at Siberian Federal University, Krasnoyarsk, Russia;
- 26 February 2019 - 2nd SUNRAISE regional meeting of stakeholders in Gorno-Altai State University.

In addition, a round of field trips in Russia by Erda RTE experts took place in the summer-autumn 2018. In particular, they visited Krasnoyarsk, Ust'-Koksa and Katunski Biosphere Reserve, Gorno-Altai, Barnaul and St.-Petersburg, with total 14 academic staff, 12 stakeholder representatives and 4 top university management representatives met. In addition, they had opportunities to teach and hold formal and informal discussions with students, and so to receive in-hand experience of identification of gaps and understanding aspirations and visions. Bhutan and India partners have not received field visits due to logistical and budgetary constraints, however that was partly compensated by online meetings and also by interactions with Indian PhD students, who has attended a SUNRAISE summer school in Krasnoyarsk and Gorno-Altai.

The feedback resulted from these events and encounters has been presented in a form of comments to the original list of courses, and then individually discussed with all the course holders. The resulting list with justifications has been presented to partner meetings. The final version has been presented in , September 25, 2018 at SUNRAISE meeting in St.-Petersburg, Russia, however some further discussions and light modifications were going on even after the end of the contract with Erda RTE on *bona fide* basis.

2.2. RESULTS – THE PROPOSED COURSES AND THEIR JUSTIFICATION

2.2.1. E-LEARNING MODULES / COURSES

The table above gives justifications to courses as they were established in a dialogue with course owners (the right column), and refers to key statements, concerns and suggestions voiced on stakeholder meetings (the left).

Main statements of end-users and stakeholders	Established (upgraded or new) courses
<p>Workshop of 21 May 2018: <i>It was recommended that climate change adaptation and disaster risk reduction programme should be integrated into the overall process of development planning at watershed level in the Himalayan mountains, and this should find important place in the higher education system</i></p> <p>Workshop of 22 May 2018: <i>Climate Change and drudgery increase leading towards migration and discouragement</i></p> <p>Workshop of 18 May 2018: <i>The most of the respondents preferred to „understand trends and character of climate change, and climate change impacts on ecosystems, biodiversity and human well-being“</i></p> <p>Workshop of 18 May 2018: <i>„develop environmental risk reduction activities“;</i></p>	<ol style="list-style-type: none"> <li data-bbox="762 470 1481 918"> <p>1. Climate Change Impacts and Adaptation in Himalaya, MA/MSc, 4 ECTS (Kumaun University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge of the impacts of climate change in Himalaya and the need of evolving and implementing effective adaptation strategies. The main objectives of the course are: (i) to help students in understanding the increasing impacts of climate change on natural and socio-economic systems in Himalaya; (ii) to provide students with the state-of-art recent knowledge about the climate change induced natural disasters in Himalaya and (iii) to appraise students about the need of developing effective climate change adaptation strategies and mainstreaming climate change adaptation in development planning. Target Student Audiences - Semester - III Students of M.A./M.Sc.</p> <li data-bbox="762 922 1481 1377"> <p>2. Risk, Vulnerability and Resilience: Concepts and Understanding, MA (offered on AY 2019/20 and 2020/21, 1st semester July-December), 4 ECTS (Jawaharlal Nehru University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge on vulnerability assessment. The main objectives of the course are: (i) To help students understand the concepts of risk, vulnerability, resilience, and vulnerability assessment methods, critically analyze them, (ii) To understand the basics to develop framework and recommendation for vulnerability assessment techniques, (iii) To help students guide through entire process of risk assessment using geospatial domain, and (iv) To understand and formulate requirements of hazard data and methods. Target Student Audiences - Semester - I Students of M.A.</p> <li data-bbox="762 1382 1481 1832"> <p>3. Ecosystem Approach for Disaster Risk Reduction, MA (offered on AY 2019/20, 3rd semester July-December), 4 ECTS (Jawaharlal Nehru University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge of importance of integrating ecosystem-based disaster risk reduction into development planning. It would emphasize on the need and preparedness for ecosystem management, disaster risk reduction, climate change and development. The main objectives of the course are: (i) to help students in understanding disaster typology, risk, and their impacts; (ii) to comprehend approaches and measured for disaster risk reduction; and (iii) to enumerate possible pathways, and options for disaster risk reduction and sustainable development. Target Student Audiences - Semester - III Students of M.A.</p> <li data-bbox="762 1836 1481 2045"> <p>4. Climate Change Assessment and Mitigation, BSc, 6 ECTS, (Royal University of Bhutan). This module provides students with concepts on vulnerability, adaptation, mitigation and negotiation concerning climate change. Students can learn to develop vulnerability indices and formulate adaptation and mitigation options. Target student audiences - final year BSc students.</p>

	<p>5. The impact of climate and its changes on the state of ecosystems and human activity in the polar and mountainous regions, MSc, 3 ECTS (Russian State Hydrometeorological University).</p> <p>The goal of the discipline is the formation of a complex of scientific and practical knowledge about the physiological, behavioral and technological adaptations of man to various types of climate and their changes, to carry out daily production activities and social planning. -economic development of the regions of the Arctic, Siberia, the mountainous regions of the European part of the Russian Federation, etc. Target student audiences - MSc students in ecology and environmental management.</p> <p>6. Synoptic meteorology of the Arctic region, BSc, 3 ECTS (Russian State Hydrometeorological University).</p> <p>The purpose of the discipline "Synoptic meteorology of the Arctic region" is the general professional course of bachelors of applied and polar hydrometeorology, it allows students to understand the essence of phenomena and processes occurring in the arctic atmosphere. Target student audiences - BSc students in hydrometeorology.</p> <p>7. Monitoring and early warnings in mountain social-ecological systems (Consortium-wide course – a summer school).</p> <p>The goal is to support sustainable governance of mountainous socioecological systems in Southern Siberia and beyond through the promotion of European expertise in problem framing and development of sustainable solutions for high mountains under the ever increasing pressure from tourism, recreation, urbanization as well as global environmental change, such as climate change and large-scale environmental pollution. We put emphasis on knowledge co-production exercises involving researchers and representatives of relevant stakeholders. Target student audiences - are senior master's and PhD students, junior researchers and faculty, as well as civil servants, environmental activists and anyone interested in the management and governance of mountain systems, EU studies, and governance of natural resources in general.</p>
<p>Workshop of 22 May 2018: <i>Management practices for water including techniques of conservation, management and their comparative analysis for further adoption at mass scale.</i></p> <p>Workshop of 22 May 2018: <i>Management practices for water including techniques of conservation, management and their comparative analysis for further adoption at mass scale</i></p>	<p>1. Integrated Watershed Management, MA/MSc, 4 ECTS (Kumaun University).</p> <p>This course has been designed with a view to help students in developing a comprehensive understanding and knowledge of the Integrated Watershed Management approach and its significance and rationale for sustainable mountain development in context of the Indian Himalayan Region. The main objectives of the revised course are: (i) to help students in understanding the significance of watershed approach in sustainable mountain development; (ii) to provide students with the state-of-art recent knowledge about the relevance of watershed approach in climate change adaptation and Disaster Risk Reduction mountains; (iii) to educate students about the rationale and importance of Trans-boundary Watershed Management in Himalaya; and (iv) to make students to understand upstream and downstream linkages in river basin system. Target Student Audiences - Semester - IV Students of M.A./M.Sc.</p> <p>2. Water Resource Management, BSc, 6 ECTS (Royal University of Bhutan).</p> <p>The main aim of this course is the natural, social and technical aspects of sustainable water resource management. The module explores current and emerging national and international water issues to link with interdisciplinary approaches to find solutions. Essentially the main aim of this course is to learn the sustainable water resources management in the context of depleting water resources and also the water resources scarcity in the context of</p>

	<p>human population and climate change. Target student audiences - final year BSc students.</p> <p>3. Hydrology, BSc, 6 ECTS (Royal University of Bhutan). This module will equip the students with knowledge on the movement, distribution, and quality of water including hydrological cycle, snow and water resources constrained by climate variability and change and its impact. Target student audiences - Second year BSc students who will become professionals in environmental science.</p>
<p>Workshop of 22 May 2018: <i>Use of GIS and how to balance the ground facts and technologies</i></p> <p>Workshop of 18 May 2018: <i>Development and support of web sites, web pages and online databases</i></p>	<p>1. Remote Sensing, GIS for Emergency Management, MA (offered on AY 2019/20 and 2020/21, 2nd semester January-June), 4 ECTS (Jawaharlal Nehru University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge on remote sensing and GIS for emergency management. This course introduces the principal concepts and techniques of Remote Sensing and GIS, primarily from the perspective of disasters and its aptness for disaster management. It addresses fundamentals and theoretical aspects of interpretation. Course consists of two interrelated parts: a theoretical one that focuses on the concepts to understand disasters footprint as one of Sendai priorities and a practical one that aims at developing hands-on skills in understanding and displaying risk prone areas using (mostly software) tools. Target Student Audiences - Semester - II Students of M.A.</p>
<p>Workshop of 21 May 2018: <i>Forest, Water and Biodiversity Conservation emerged as one of the important components for higher education system in Himalaya</i></p> <p>Workshop of 22 May 2018: <i>Impact of anthropogenic factors in biodiversity and natural resource use</i></p> <p>Workshop of 22 May 2018: <i>More focus on holistic planning and multitasking for sustainable development and biodiversity conservation</i></p> <p>Workshop of 22 May 2018: <i>Specific studies on human wildlife conflicts and loss/utilization of agriculture/horticultural biodiversity;</i></p> <p>Workshop of 18 May 2018: <i>Assess biological resources / biodiversity, and develop and/ or implement biodiversity restoration activities;</i></p> <p>Workshop of 18 May 2018: <i>prevent or resolve conflicts between the users of nature/environmental resources (including biological, land and water resources);</i></p> <p>Workshops of 28 May 2018 & 26 February 2019: <i>to understand the context and implications of natural resource management and governance in the areas inhabited by indigenous people or other</i></p>	<p>1. Man & Tropical Forest Ecosystem Function, MPhil (offered on AY 2020/21 2nd semester January-June), 2 ECTS (Jawaharlal Nehru University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge on concepts man and forest interaction with greater degree of emphasis on forest ecosystem functions. The course work touches upon fundamental concepts of forest ecosystem function at stand level to global perspectives. The course provides a strong ecological perspective and understanding of forest, its structure and functions. The main objectives of the course are: (i) to help students in understanding forest ecosystem functions; and (ii) to comprehend this knowledge to understand its linkages with human beings. Target Student Audiences - Semester - I Students of M.Phil. (Pre-Ph.D.)</p> <p>2. Himalayan Ecology, MPhil (offered on AY 2020/21 2nd semester January-June), 2 ECTS (Jawaharlal Nehru University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge on Himalayan environment and ecology. In the recent years it has become increasingly evident that human activities and practices produce significant changes in the mountain ecosystems and the Himalaya is one of the hotspots of this. The course provides an perspective to look in the Himalayan landscape from multiple perspectives. The main objectives of the course are: (i) to help students in knowing Himalaya and its unique setting; and (ii) to comprehend the challenges and issues related to Himalayan landscape and its relevance in the present context of environmental development in the country. Target Student Audiences - Semester - II Students of M.Phil. (Pre-Ph.D.)</p> <p>3. Integrated Mountain Development with Special Reference to Indian Himalaya, MA/MSc, 4 ECTS (Kumaun University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge of the critical environmental and developmental issues of important</p>

<p><i>communities with traditional life styles</i></p>	<p>mountain regions of the world and need of their sustainable development in context of the Indian Himalayan Region. Target Student Audiences - Semester - I Students of M.A./M.Sc.</p> <p>4. Natural Resource Management, MA/MSc, 4 ECTS (Kumaun University). This course will help in developing a complete understanding of concept of and process of natural resource development, and their conservation and management using application of Remote Sensing (RS) and Geographic Information System (GIS) with special reference to high mountains and Himalaya. To help students in understanding the concepts of natural resources, learning methods of resource analysis and mapping, and developing natural resources information system using geo spatial techniques. The main objectives of the course are: (i) to understand the process of natural resource development in varying natural and socio-economic, and legal environment; (ii) to demonstrate the application of state-of-art Remote Sensing (RS) and Geographic Information System (GIS) with special reference to high mountains specifically Himalaya; (iii) to help students in learning concepts and approaches of natural resources management and understanding its interlinkages with sustainable mountain development in context of Himalaya. Target Student Audiences - Semester - I Students of M.A./M.Sc.</p> <p>5. Natural Resource Management, BSc, 7.5 ECTS (Royal University of Bhutan). The main aim of this course is to equip students with knowledge required to understand the basic concepts of biophysical and human dimensions of natural resources management. Also, this course allows students to explore the GIS and remote sensing tools to assess and monitor the natural resources for effective management. It introduces students to the natural resources management in general and then raises questions on how the small countries like Bhutan can manage the limited resources effectively. The course includes several group exercises, such as seminar. The exercises are expected to develop hand on practical skills and have in depth understanding of natural resources management in specific context. The explanations are based on the examples from the developing countries and, where applicable, reflect on options for Bhutan, in particular and also links with their transboundary context. Target student audiences - first year MSc students who have bachelors in Science from a recognized university.</p> <p>6. Ecosystem Processes, MPhil (offered on AY 2020/21 1st semester July-December), 2 ECTS (Jawaharlal Nehru University). This course has been designed with a view to help students in developing a comprehensive understanding and knowledge on concepts and applications of ecosystem processed. In the recent years it has become increasingly evident that human activities and practices produce significant changes in the status of the environment and global climate. The course provides an ecosystem perspective to look at these changes and advocates for ecosystem/landscape approach to understand them and find solutions. The main objectives of the course are: (i) to help students in understanding ecosystem processed; and (ii) to comprehend approaches and measured for ecosystem/landscape assessment. Target Student Audiences - Semester - I Students of M.Phil. (Pre-Ph.D.)</p> <p>7. Natural-resource potential of regions (Mountain and Arctic modules), BSc, 3 ECTS (Siberian Federal University). The main course objective is to provide students with an insight into relevant natural resource potential of the territory. The first part of the course is devoted to the study of the main approaches</p>
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	<p>to the natural resources classification, the principles of using renewable, relatively renewable and non-renewable natural resources. In the second part of the course, we will study the types of limitations (technological, ecological, economic, social) when using natural resources (land, forest, water, biological resources, fossil fuels, etc.). Target student audiences - BSc students in ecology and environmental management.</p> <p>8. Environmental safety of mineral resources exploration on the Arctic shelf, MSc, 3 ECTS (<i>Russian State Hydrometeorological University</i>).</p> <p>The main course objective is to develop in students the ability to develop typical environmental protection measures and conduct an environmental impact assessment of planned facilities or other forms of economic activity; and the ability to use regulatory documents governing the organization of industrial and technological environmental work and methodically competently develop an action plan for environmental audit, monitoring compliance with environmental requirements, environmental management of production processes. Target student audiences - MSc students in ecology and environmental management</p>
<p>Workshop of 21 May 2018: Sustainable Mountain Urban Development should be included in the higher education curriculum across the Himalayan Universities; Workshop of 18 May 2018: Develop strategies and / or action plans for local sustainability of High Mountain</p>	<p>1. Ecological Aspects of Urbanization in Mountain Areas, MSc/PhD, 3 ECTS (optional course) (<i>Paris Lodron University of Salzburg – a review of a direct suggestion by an EU partner</i>).</p> <p>The main course objective is to introduce the students to ecological aspects of urbanisation in mountain areas, with a focus on socio-environmental issues and solutions. The particular aims are to understand: The weaknesses and strengths of the responses provided to the environmental crises, including the eco-city concept. The alternative approaches for a more sustainable city. The role of urban nature as a strategy for the attainment of sustainable cities. The potential of ecosystem services to promote urban nature. The natural basis of mountain areas and mountain dynamics. The human-nature relation in mountain areas and its evolution in time. The issue of urbanisation in mountain areas. The risks and challenges of settlements in mountain areas, and adequate measures of dealing with them. Strategies for sustainable mountain cities. Target student audiences - Master and doctoral students from various study programmes.</p> <p>2. Sustainable Development (Mountain and Arctic modules), BSc, 3 ECTS (<i>Siberian Federal University</i>).</p> <p>The goal of course studying is to form students' knowledge and expertise about the establishment of basics and ideas of sustainable development, general objectives and main principles of society evolution in the 21st century. Target student audiences - last year BSc students in ecology and environmental management.</p> <p>3. Sustainable development of mountain territories, MSc, 3 ECTS (<i>Gorno-Altai State University</i>).</p> <p>The aim of the course is to provide students with knowledge about the sustainable development of mountain territories, including the study of the basic imperatives of sustainable development; to prepare specialists able to effectively meet the challenges associated with ecology and environmental management. Target student audiences - second year MSc students majoring in Ecology & Environmental Management and in Geography.</p>
<p>Workshops of 28 May 2018 & 26 February 2019: to organise or be involved to environmental impact and/or strategic environmental assessments</p>	<p>1. Environmental design and expertise, BSc, 3 ECTS (<i>Gorno-Altai State University</i>).</p> <p>The aim of the course is to provide students with knowledge about the environmental design and expertise and to teach them using methods and principles of the environmental impact assessment (EIA). Target student audiences - last year BSc students majoring in Ecology and Environmental Management.</p>

	<p>2. Environmental Biomonitoring (Mountain module), MSc, 3 ECTS (<i>Siberian Federal University</i>).</p> <p>The purpose of the course is to give students an advanced understanding of possibilities of biological monitoring of the environment, bio-indication and bioassay methods. Target student audiences - final-year MSc students in ecology and environmental management.</p>
<p>Workshops of 28 May 2018 & 26 February 2019: Among the most highly sought re-trainings for employers and their employees were legal literacy courses, administrative management, and English courses</p>	<p>1. A Special Course in a Foreign Language (based on the MOOC “Sustainable Development of Mountain Territories in the Context of the Concept of Ecosystem Services”), BSc, 2 ECTS (<i>Gorno-Altai State University – a request following up the discussion with the student body</i>).</p> <p>The aims of the course are to develop students’ competence for professional communication in English and to provide them with basic knowledge about the ecosystem services and the role they play in the sustainable development of mountain territories. Target student audiences - last year BSc students majoring in Geography, Ecology and Environmental Management.</p>

Following up in-depth discussions with the academic staff at partner universities in the Russian Federation regarding the development of fundamental learning outcomes at BSc and MSc levels related to understanding physical processes and management issues in Arctic and high mountainous areas, revisions of the following fundamental cross-cutting courses, with introduction of relevant components and development of dedicated teaching and learning materials has been agreed upon:

1. **Environmental Geochemistry** (with Biogeochemistry of permafrost landscapes module), BSc, 3 ECTS (*Siberian Federal University*).
The aim of the course is to study the specifics of biogeochemical cycles of macro- and microelements of permafrost landscapes; to study the intensity of the processes of mineralization of organic matter, the ratio of biomass and annual productivity; pedogenesis in permafrost landscapes and soil types. Target student audiences - last year MS’s students in ecology (majoring in environmental sciences).
2. **Soil Biology** (Mountain and Arctic modules), BSc, 3 ECTS (*Siberian Federal University*).
The main course objective is to review the theoretical foundations of soil biology and identify the features of soil biological processes in various climatic and soil conditions, including permafrost soils. Target student audiences - 2-year BSc students in ecology and environmental management
3. **Plant Ecology** (Mountain and Arctic modules), BSc, 3 ECTS (*Siberian Federal University*).
The discipline is designed to provide students with an insight into relations between plant and environment, basic principles and mechanisms of interaction between living organisms and the habitat at different levels of biological systems lay-out, impact of various factors on plants, photosensors development systems. Target student audiences - 2-year BSc students in ecology and environmental management
4. **Waste management**, MSc, 3 ECTS (*Gorno-Altai State University*).
The aim of the course is to provide students with systematic knowledge about the system of production and consumption waste management, including the activity in developing draft waste generation standards and waste disposal limits, and the activity in studying and introducing new approaches to waste treatment. Target student audiences - first year MSc students majoring in "Ecology and Environmental Management" and "Geography".

2.2.2. MASSIVE OPEN ONLINE COURSES (MOOCs)

The topics of the MOOCs are outlined in the SUNRAISE work program. The objectives of the ToR for the MOOCs have been set up and agreed with the partners as follows:

- To narrow down the scope and give the first approximation on the contents;

- To ensure that the MOOCs portray the best relevant research forces of partner universities and showcase them nationally and internationally;
- To ensure the best dissemination of SUNRAISE contents.

The partners have insisted that while these objectives need to be achieved for the MOOCs, the ToR also shall permit enough space for adjustments and suggestions, because the development of MOOCs is a creative task, they are not a subject to accreditation procedures, and in the course of MOOC development new ideas and opportunities may come, which are not to be overlooked.

MOOC topics have been discussed with the academic faculty, students and stakeholders alongside with the courses (see 2.1). The following titles and additional details have been agreed as a result:

1. SDGs for the Arctic and High Mountains, with implications for policy, management and planning

This MOOC has been understood as, on one hand, fundamental, and on the other hand challenging to implement using the capacity of partner institutions alone. It has been also noted that while in Bhutan and India SDGs are very much in the core of national policies which are closely supervised by relevant UN institutions, in Russia the awareness of SDGs is significantly lower at all the floors, and in particular by the student body. To address that the partners have advised to shift a focus of such a MOOC on Russia and, in order to ensure broad and effective dissemination, also to create it in Russian. The partners have also were of an opinion (supported by stakeholders) that in this particular MOOC it shall be important to explore options of engaging external speakers from the broader project network, so the MOOC would reflect the diversity of SDG-related issues and solutions in Russia and elsewhere. The partners agreed that it makes no sense to discuss a detailed synopsis of this MOOC at that stage.

2. Introduction to the Arctic environment and permafrost zones

This MOOC is within the core competence of the two Russian SUNRAISE partners – Siberian Federal University and Russian State Hydrometeorological University. It is dealing with the fundamentals of Earth and Life Sciences where they are dealing with Arctic environments, and the development of contents, as well as the very question of contents, can be entrusted with confidence to the joint MOOC working group at these two universities. The expectation is that the issues of Arctic climate, water resources, geology and mining, soil and vegetation have to feature in any content proposals. The advised language of the MOOC was English, as the Russian partners are confident about the international relevance of the material they are ready to present and disseminate.

3. Sustainable development of mountain areas in the context of the concept of ecosystem services

This MOOC has been proposed to elaborate by Gorno-Altai State University in Russia and Kumaun University in India considering their minor involvement in other MOOCs and their need for national and international recognition. The topic was set up in a way that it would be encouraging to use local cases and material, and to highlight the research excellence of the two universities. The suggested language of instructions is English.

The list of MOOCs was discussed and finally approved at the *SUNRAISE Consortium Meeting at Salzburg University, Salzburg, Austria (9-10 July 2019)*.

3. SUNRAISE RESEARCH FRAMEWORK

The objectives for the ToR governing the development of the SUNRAISE research framework has been set as the following:

- To outline the scope and purpose of the information that needs to be collected by partners in order to support networking and joint activities over research and research training during and after the end of the project;
- To develop an outline for a report on the SUNRAISE research framework.

Technically, this was a part of the same working process as the development of ToRs for curriculum development, with the same timeline, as well meeting, events and interviews used for the inquiries, discussions and feedback collection.

Regarding the information support, it was found and confirmed that partners know very little about each other in terms of research profiles and capacities, interest and capacity to supervise etc. Importantly, standard home pages of the partners do not provide sufficient information. It was therefore recognised as a reasonable and necessary activity to collect and make available through the webpage of SUNRAISE:

- Potential doctoral and master thesis supervisors and their profiles;
- Testimonials of current PhD students about their university and research teams;
- Information on research priorities and strategic objectives in research by each partner;
- Information on available research equipment and other experimental facilities (such as field and observation station or polygons) that can be shared with SUNRAISE partners for the purposes of research training and joint research.

The inquiries on the text of the research analysis received less interest, and the overall attitude was that the analysis itself should be as concise as possible, while the most interesting part would be in-depth research profiles of the partners with short analytical conclusions.

4. GOVERNANCE ARRANGEMENTS (STAKEHOLDER COLLABORATION PLATFORMS)

The collection of information for the ToR for stakeholder collaboration platforms was in parallel with other activities under the development of SUNRAISE ToRs keeping in mind that the target audience for all the ToRs is the same (see 2.1 for more details).

As a result, the following stakeholder platforms have been recognized as timely and relevant to create:

- A stakeholder-academic collaborative platform for the region of **Altai and Sayany** due to its importance for regional and global biodiversity and because this is where SUNRAISE partners – Gorno-Altai State University and Siberian Federal University has capacity and strategic interests to cooperate, and where they have large alumni communities and carry out regular research, i.e. possess regional knowledge that might be of interest to stakeholders, and potentially may find reliable focal points in various stakeholder organisations;
- Himalayan stakeholder-academic collaborative platform with a focus on the **Central Himalaya** in India; this is due to the geographical location and focus of Kumaun University (a SUNRAISE partner in India) that has a high level of reputation and legitimacy in the region, and also due to research interest of the SUNRAISE group at Jawaharlal Nehru University (the second SUNRAISE academic partner in India) – likewise both universities has there a rich alumni network and already have substantial research cooperation experience that would be beneficial in terms of post-project sustainability.

For these two platforms a proposed organizational format is a series of bilateral agreements with SUNRAISE NGO partners based in the respective regions – ASMP (Russia) and CHEA (India). Representatives of ASMP has stressed out that the agreements should take a formal format, e.g. as formal letters of accession to the network that would be established by several founding members on the inaugural meeting. The inquired stakeholder representatives in the region have confirmed that the relationship should be indeed formal. This is in order to give such a relationship an appropriate status in their paperwork, but also to ensure sustainability and have a references in case if managers or focal points in partner organizations would be changed.

In contrast, stakeholders in India insisted that getting a formal commitment can be a very demanding procedure, and many potential partners would give up even without starting. In particular this would concern business and public bodies. Some also added that because this type of partnership would not imply (at least at the initial stage) and binding financial commitments, paper signing would not really have any meaningful purpose, while informal ties can be robust and sustainable, especially if the platform would prove to be a robust and worthwhile arrangement. Another issue worth mentioning is that many important local networks are not institutionalized, and therefore cannot provide any papers on behalf of an organisation. The discussed solution was therefore to hold a series of stakeholder events, e.g. by the Kumaun University in cooperation with Jawaharlal Nehru University, to recruit several anchor NGO partners active in the region (and probably to get them signed an accession letter), and then proceed with working with formal and informal networks of those NGOs, and developing the cooperation agenda based on the outcomes of the events as well as specific collaboration modalities suggested by the anchor NGOs.

The discussions over a potential **Arctic** collaboration platform for Russia have been the most challenging. Here we have face a dilemma. On one hand, the cooperation over the Arctic is a monumental priority in Russia with virtually everyone interested to have a noticeable role. On the other hand this sector is super monopolized by the state and, behind, there are already quite a few established networks backed by various public bodies and with set agendas, which are sometimes very close to the one offered by SUNRAISE. Under such circumstances a suggested solution is to align with an

established network, e.g. one including both SUNRAISE partners concerned with the Arctic – Russian State Hydrometeorological University (RSHMU) and Siberian Federal University, and to channel stakeholder work through RSHMU as a representative in this network. The visibility of SUNRAISE and Erasmus+ shall be achieved through due acknowledgements attached to specific deliverables, events and/or actions.