Engaging in Sustainability: A New Mountain-Focused BSc. Degree in Earth and Environmental Sciences for the University of Central Asia

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Introduction

Post-secondary education is an important aspect of enabling mountain communities to become active agents of change towards resilience and sustainability. When students study, research and participate in mountain or other communities, they become active participants in transforming those communities towards sustainable futures within existing cultural and environmental contexts [e.g. 1]. The curriculum development partnership between University of Central Asia (UCA) and University of British Columbia (UBC) (UBC) is an innovative stepping stone towards achieving sustainable futures in mountainous Central Asia.

What is the Earth and Environmental Sciences (EES) program?

● 3 pre-requisite courses (blue): developed and currently being taught.
● 11 required courses (light green and yellow):
  ○ A general and technical background with likely employment or further education.
  ○ Courses in fundamentals of both geology and environmental sciences
  ○ Geographical & societal contexts of mountainous Central Asia.
● 8 elective courses,
● 4 Geoscience (dark green)
● 4 Geography / Environmental Science (orange)
● Specialized exposure to, and practice in discipline, specific fields.
● Practice knowledge / skills for transfer application in new situations.

Facilitating Active Engagement with Mountain Issues

1. Fundamentally driven by UCA Core Literacies articulated in 2016 [2].
2. Foundational course components are derived from UBC courses.
3. Courses are then further adapted to employ Central Asian contexts.

5. Visited with local people, professionals, & organizations.
   Examples:
   ○ Khorog state University;
   ○ AK Agency for Habitat (AAH);
   ○ Mountain society Development Support Program (MSDSP);
   ○ Mountain Societies Research Institute (MSRI).

6. Some Central Asian issues were researched and documented by UBC undergraduates employed as Academic Assistants.
   a. OBOR: China’s Belt and Road Initiative, and Influences on the Region.
   b. Summaries and resources about:
      ▪ natural hazards
      ▪ energy use & availability
      ▪ professional opportunities in EES
      ▪ climate change
      ▪ community conservancies
      ▪ reference collections
   c. Six case-histories about environmental challenges in Central Asia were developed for the Mixed Research Methods course.
      ▪ Students will develop their own research proposal & questions.
      ▪ This student-generated content will empower student to be knowledge creators as well as knowledge users.

Example Case History:

Community-based conservancies and snow leopards. International organization Panthera works with Pamirs villages that are dealing with snow leopard / human conflicts [4]. They also address illegal international trade in snow leopards in cooperation with authorities. After becoming familiar with conflicts around Snow Leopard habitat and population, students will create a research proposal.

UBC/UCA Partnership Curriculum Development Model and Timeline

An innovative combination of hard science and human, social and environmental subjects.

This is a tentative timeline sequence only. Logistical, personnel, and other circumstances may result in some shifts as we achieve or maintain 2-4 years.

However, the key objective is to produce a flow of learning for students through their degree program.

UBC/UCA Partnership Curriculum Development Model and Timeline

Sources and acknowledgments:

1. Garraway, Eric, John Parnell, and Delano S. Lewis. 2017. “Successful Community-Based Conservation: The Story of Millbank and Millburn Conservancies during the conservation science course.”

2. “In one of the courses, Geochemistry, students will be discussing and debating their scientific knowledge and ethical issues related to the geological and environmental sciences.”

3. “Courses i develop will be global in scope but will include some regional examples to aid with context and relevance. The issues faced by mountain communities and Central Asian nations in general are not unique - they are very similar to those being faced elsewhere. Being exposed to international/global processes as well as problems and seeing how these are dealt with in other places is very important. There are many lessons of paths to follow or to avoid.”

4. “Students will be visiting several community-based conservancies during the conservation science course.”

5. “Some of our “active learning” assignments and projects encourage instructors to have students engage with the subject matter within local geographical or cultural settings.”

Q: What is a challenge associated with developing a course?

Some quotes:

“"This degree has a strange dichotomy because of its strong geographical nature. Few will end up with hard science/geochemical interests.”

“One course developer expressed concern that, although local knowledge is vital for strengthening mountain communities and encouraging local participation, sometimes it can be incompatible with current imperatives of changing mountain dynamics.

"Judging by the students interest in jobs, I’m not sure that they would stay in local communities after they complete the courses”

Challenges may arise when bringing international higher education & research to mountain settings, but we believe post-secondary educated people will be both more mobile and better able to support the engagement of local, mountain communities within global societies.