



Labour market need analysis for the review of BSc program in Environment and Climate Studies Program at College of Natural Resources (Royal University of Bhutan)

The purpose of this document is to document the tracer study and the stakeholder's perception on existing curriculum for BSc Environment and Climate Studies. This document is used to build a basis why certain courses requires revision and why certain new courses need to be developed. This document however do not capture the perception of the faculty members but the stakeholders and past students suggestion is taken is basis to justify why certain courses (modules) are required to change or revise.

I. Tracer study and stakeholder survey Report for the review of Bachelor of Science in Environment and Climate Studies

1. Introduction

1.1 Tracer Study of the Graduates

For the tracer study of Environment and Climate Studies programme the 1st batch of ECS graduates and various relevant organizations were involved. For the tracer study semi structured questionnaire were developed which focused getting responses from the graduates on the relevancy of the ECS programme, changes required in the programme, changes required in the modules, knowledge competency gained, skills gained, the relevancy of ECS programme to their current job / studies, their current job responsibilities and professional issues faced in their work place, professional help required / received after graduating from CNR, level of satisfaction gained from the programme, other feedbacks and requirement of an ECS honors programme.

During the tracer study period the graduates had just exited the college and those who had joined different agencies had work experience of no more than 2 to 3 months while few had been accepted to pursue further studies in international, regional and national institutes. Following were the status and various agencies where the ECS graduates had joined:

1. MSc in India FRI = 2 graduates
2. MSc in Australia = 1 graduate
3. MSc in Japan = 1 graduate
4. RIM/PGDPA =1 graduate
5. Teachers, MoE: 8 graduates



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6. Assistant Environment Officer: 6 graduates
7. Resident Coordinator, CNR: 1 graduate
8. Programme Officer, MOIC: 1 graduate
9. Economic Development Officer, MOEA: 1 graduate
10. Thimphu Thromde, Asst. Human Resource Officer = 1 graduate
11. Work Overseas: 1 graduate
12. Private Consultancy: 1 graduate
13. Looking for opportunities = 5 graduates

1.2 Stakeholder Survey

Various relevant government and non-government agencies, as listed below including the ones where the ECS graduates had joined, were considered for tracer study and review of the programme. From the total 19 agencies selected, 15 responded to the stakeholder survey. The stakeholders were explained and provided the background about the programme. They were also presented with a hard copy of ECS curriculum map during the survey.

1. National Biodiversity Centre
2. National Centre for Hydro-Meteorology
3. National Environment Commission
4. Gross National Happiness Commission
5. Royal Society for the Protection of Nature
6. Watershed Management Division
7. Bhutan Himalayan Institute
8. National Soil Service Centre
9. Bhutan Ecological Society
10. Kalachakra Consultancy
11. Thimphu Thromde, Environment Division
12. Punakha Environment Officer
13. Tourism Council of Bhutan
14. Natural Resources Development Corporation Ltd.



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For the stakeholders' survey semi-structured questionnaire were developed which focused getting responses on the Entry Criteria in the ECS programme, Teaching and Learning approach, Assessment approach, Curriculum Structure, Relevancy of the modules, and on the need of revision or addition to existing modules of the programme.

2. General Observation on the ECS programme and the Modules

2.1 Observation from the Graduates

- On the relevancy of the modules, the graduates responded that the modules were very relevant as their job responsibilities matched with the knowledge gained from the existing modules.
- Majority of the graduates found that the programme was useful and they were satisfied with the overall programme and found it enriching with theories and practical aspects.
- Modules such as Internship (ATT304) and ProjectWork (PWK303) were “bonus for any kind of work requirement”.
- Upon asking the difficulty level of the programme from “very difficult” to “very easy”, the graduated rated the programme as “Easy” and few found it “neutral”.
- On general, the graduates responded that the ECS programme had provided them skills that matched their current job, while few expressed the need of modules that taught about biodiversity of floral species and its identification, identifying business ideas in agriculture and tourism, familiarisation on environmental policies, laws of country, international agreements, conventions related to environment.
- Some of the professional issues faced by the graduates were found on general such as lack of confidence in official communication, dealing with other officers, work-space system. To this, they had received induction, training, and attending office workshops helped them overcome these issues.
- Graduates reported of having limited opportunities in the organizations that are related to the ECS programme.
- Graduates suggested the following changes in the existing modules:
 - Introduction to Sociology (SOC101) module could be removed since the ECS is a technical programme or introduce environmental Sociology to understand societal-environmental interaction including the aspect of sociology itself. While the current module on Introduction to Sociology (SOC101) emphasizes on structure of society, functions and cultures and development compromising the understanding of environment through human development only.
 - Introduction to Communication Technology (ICT101) could be removed as IT components can be self-learned and the module can be replaced with a module on Botany, Ecology or Green Entrepreneurship.



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- Dzongkha module (DZG101) could be shifted to the final semester as it would also help in RCSC preparation.
- Project Work module (PWK303) could be renamed as “BSc Thesis” as it will be reflected in transcript and will benefit the graduates while applying for further studies / while applying for job.
- Environmental impact Assessment module (EVS309) needs to incorporate EMP, and documents and reports from relevant agencies / offices like NEC. The module also needs to incorporate familiarizing learners with practical reality and working procedures in Bhutanese context.
- Spatial Information System for Environmental Studies (GIS203) module needs practical and not only lab-based learning.
- Vegetation Dynamics (NRM212) module needs to incorporate plant taxonomy due to difficulties faced in nomenclature and identification of plants and tree species
- Graduates also listed some of the components that were common / repeating in two or more modules and are listed below;
 - Introduction to Meteorology and Climatology (CLM103) and Climate Change Adaptation and Mitigation (CLM205). The suggestion was that the contents can be integrated together and term it “Conservation and Restoration of Ecology”
 - Hydrology module (CLM102), Integrated Watershed Management (NRM306) and Water Resource Management module (NRM101) overlap almost 70%, these should be merged or reviewed.
- Some of the new modules suggested from graduates are;
 - Introduction to Botany
 - Zoology (special identification)
 - Plant taxonomy
 - Conservation and Restoration of Ecology with emphasis on conservation of genetic resources that can be lost to climate change, invasion of exotic species, Restoration ecology, geographic condition in Bhutan. Therefore, this module will become a forefront to understand the issue
 - Behavior Economy
 - Green entrepreneurship
 - Climate Prediction
 - Economics
 - Management
- Comments from graduates pursuing further studies after their BSc in ECS suggest that if the programme is made into a 4 year programme then it would benefit the ones who would like to apply for Masters programme in universities abroad.



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2.2 Observation from the Stakeholders

- Comments on the teaching and learning approach were as follows;
 - Introduction of motivational and inspirational talks in addition to academics (inspire and motivate the students to self-learning approach)
 - Inviting guest lecturer
 - Enhancement of presentation skills / oral skills
 - Need to give less group assignment but more of individual assignments
 - Students must conduct research activities related to environmental issues
 - Practical case studies might be helpful which will assist the students to learn about actually applying their academic knowledge in the real world.
- Comments on the current curriculum were similar to comments from the graduates such as having Introduction to Information and Communication Technology (ICT101) and Dzongkha (DZG101) as an optional subject, and Academic Skills (ACS101) and ICT101 modules could be merged.
- Inclusion of subjects like of “Environmental Ecology”, “Waste Management”, “Environmental Valuation”, “Acts and Bylaws” of the country governing the environmental activities, SIA (social impact assessment) and HIA (health impact assessment), “Sustainable Land Management” to the existing modules are suggested.
- Modules like Energy and Environment (EVS308) and Disaster and Hazard Management (HAZ301) to be taught in the early in the program.
- Response on the relevancy of the modules offered showed that ACS101, SOC101, and NRM212 were seen as not relevant by the stakeholders.
- Following were the suggested new modules by the stakeholders which could be incorporated in the programme:
 - Urban Environment Management
 - Waste Management
 - Biodiversity Conservation
 - Proposal writing for grants
 - Course on Climate and Hydrological software
 - EMP (environmental management plan)
 - Sustainable land management
 - Gender and environment



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- Stakeholders were asked to list the skills that their firms expect from the graduates they choose to recruit responded that graduated with interest in research (Be able to collect, record, analyze and interpret information, use conventions of scientific argument, judgment and deduction, generate hypothesis), and demonstrate field skills in Ecology, environmental processes, interpret scientific information, have effective communication, and with cultural and interdisciplinary diversity.
- Their expectation from the CNR graduates were attitude and willingness to adopt to an working environment, having Knowledge in cross-cutting areas like environment and climate change are required to understand and explain from national, regional and international perspective, Explain public on complex legislation and procedures, have the ability to analyze problems and find solutions, and have good organizational skills and can handle stress.

3. Programme Title, Overall Aim and Learning Outcomes

- Not covered during this study. To be covered during stakeholder workshop meeting and review team.

4. Programme Structure

- There were minor comments on the overall programme structure from the students and the stakeholders where to shift the modules DZO101 from semester 1 to semester 6, and to teach EVS308 and HAZ301 module in the early years of the programme. However, comments on the module contents and suggestions to merge modules and to introduce new modules were provided by both graduates and stakeholders (as clearly mentioned under sections 1 and 2).

5. Teaching, Learning and Assessment Approach

- There were no major comments from the graduates on the teaching and learning, and assessment approaches.
- Stakeholders suggested to have higher CA component, up to 70% – 80%
- More to be covered during Stakeholder Workshop meeting and review team.

6. Entrance Requirements

- Comments from the stakeholders on the entrance requirement on the subjects were as follows;
 - weightage was to give more weightage in English subject as writing is found to be poor in graduates.
 - All science subjects could be given same weightage
 - Biology and Chemistry subjects could be given equal weightage, and higher weightage in Chemistry is not necessary



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- The course could be made accessible to students with Arts background as well, and to add Geography subject in the weightage equal to Math
- This will also be covered during stakeholder workshop meeting and by review team.

7. Assessments and Progression

- Not covered during this study. To be covered during stakeholder workshop meeting and review team.

8. Programme Management, Quality Assurance, and Enhancement

- Not covered during this study. To be covered during stakeholder workshop meeting and review team.

9. Resources

- Not covered during this study. To be covered by module reviewers and during stakeholder workshop meeting along with the review team.
- Lab, practical manuals, and library resources were not covered during this study. To be covered by module reviewers and during stakeholder workshop meeting along with the review team.

10. Specific Modules

- After the stakeholder and tracer study, CAC was held where the findings were discussed. Thereafter, programme review team was formed led by the Programme leader and the module tutors / relevant tutors / lab technician were to be involved in reviewing all the modules of the EVS programme.

II. Stakeholder workshop report

1. Introduction

Stakeholder consultation meeting was conducted on 28th and 29th November 2019 in staff conference hall, CNR. Members present during stakeholder meeting comprise external review panel and in-house member (i.e. ECS department and module tutors). External review members are invited by the ECS department after being nominated by head of their respective organizations. Main aim of the stakeholder meeting was to discuss on overall program document with more emphases on entrance requirement, curriculum structure, relevancy of the modules and its content. Not much focus was given to program document which largely deals with infrastructures and facilities as it was discussed during review meetings in PCM and CAC. The feedbacks, recommendations and expertise



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shared by external stakeholders for the review of Bachelor of Science in Environment and Climate Studies programme are provided below under each specific heading.

Members present for stakeholder meeting

| In-house Member | External Review Panel |
|-------------------------|---|
| Ms. Yogeeta Dahal (HoD) | Mr. Chimi Rinzin (United Nation Development Programme) |
| Sangay Tshering (PL) | Mr. Kencho Dorji (National Biodiversity Center) |
| Ms. Chogyel Wangmo | Mr. Tshering Wangchuk (Department of Disaster Management) |
| Mr. Penjor | Mr. Younten Phuntsho (Forest Resources Management Division) |
| Mrs. Phub Dem | |
| Mr. Ugyen Dorji | |
| Mr. Jambay | |

2. Department name

External review panel suggested changing department name to department of environment and resources (DER). After exhaustive discussion, house decided with existing name with a view to keep wide scope of the program both in environment and climate science field.

3. Curriculum map

Expertises shared from the external review panel on curriculum map are provided below in the table. The shuffling of modules in curriculum structure in view of levels of the students was also recommended. Feedbacks and recommendations provided are well discussed during review meetings in PCM and CAC, and some are taken into consideration in view of the currency.

| S.No | Existing modules | Feedback and recommendation from external review panel |
|------|--|--|
| 1 | EVS104 Introduction to Environmental Studies | - Also add another module to introduce Climate Studies. - Changed module name to environmental science and climate change |
| 2 | ACS101 Academic Skills | To make a crash course – a month long rather than a semester and credit based |
| 3 | DZG101 Dzongkha | Include driglamnamzha |
| 4 | CSC203 Conservation and Ecotourism | Need to focus in Nature based solution (Bhutan is getting attention due to mitigation and not adaptation) |

| | | |
|----|--|---|
| 5 | ICT101 Introduction to Information and Communication | Include social media application |
| 6 | SOC101 Introduction to Sociology | This could be an induction course as a pre-requisite before students go for attachment/ internship so that they have background on community network. To maintain certain element that is relevant and gives students a week long induction course. Merge with internship course |
| 7 | CLM102 Hydrology | To be sent to NCHM for comments (since stakeholder meet has no experts from NCHM) |
| 8 | GIS203 Spatial Information Systems for Environment Studies | Does it have climate modelling? And to introduce climate modelling basic terms and projection |
| 9 | NRM306 Integrated Watershed Management | Merge with hydrology |
| 10 | COM205 Climate Change Adaptation and Mitigation | Keep this as it is since Mitigation is important More details of Adaptation and mitigation in NEC NDC document – that can be adopted here – technology and terms and strategies |
| 11 | CLM204 Global and Regional Climate Change | Club the module/merge the module content during the review with other relevant modules |
| 12 | HAZ301 Disaster and Hazard Management | Suggested title: Disaster Risk Reduction and Management (trending term) |
| 13 | CLM306 Climate Smart Agriculture | - What is smart? This term is not really accepted in FAO. - Climate Resilient Agriculture is preferred term |
| 14 | ATT304 Internship | Develop internship guideline |

4. New module suggested

1. Religion and Environment

External review panel suggested including religion and environment as a module based on the argument that social perspective such as local beliefs in the region is important for conservation/protection of environment. Panel also pointed out that to maintain balance in the ecosystem/environment, social network built through religion is important for conservation of biodiversity.

5. Entrance Requirements

The panel suggested keeping the entrance requirement criteria as “pass in all subjects”, instead of reflecting the minimum required mark of 50% in Chemistry. After discussions, house stood to keep the existing general requirement criteria in view of giving more selection priority for those class 12 science students good in chemistry.



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6. Assessments

External review panel suggested reducing the workload of the students and focusing on the quality. This is based on the perspective that students would face difficult time to complete assigned tasks on time which would hamper the quality. Panel recommended providing fewer total numbers of assessments with specific word counts along with elaborated assessment criteria details.

7. Relevancy of the modules

External panel shared that most of the modules offered in the programme are very relevant and current programme is deemed important being science based. To update with currency, panel also recommended the changes to be incorporated as provided in the table for the reason that students would be more competent in job market with many others.

8. Module content

Detail screening for all the modules was not covered due to time constrained. Comments received from the panel were shared to the module reviewers and incorporated in module descriptors.