

SUMMARY REPORT OF THE QUESTIONNAIRE SURVEY FOR THE INTEGRATION OF ENVIRONMENTAL POLICY, MANAGEMENT, AND TECHNOLOGY TRAINING IN DOCTORAL EDUCATION PROGRAMS IN MONGOLIA

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Abstract

This survey initially investigates by research method with deans of different academic departments or selected leading environmental and educational researchers of Mongolia /P8 and P9/.

The survey questionnaire consists of 11 questions. The study is a component of the ERASMUS funding project on integration of environmental policy, management, and technology into the doctoral training program for decision making. The similar survey was also conducted in Vietnam and in Ukraine.

Keyword: *Doctoral program, quality of curricula, partnership, competence of researcher*

Introduction

The end of the 2016-2017 academic year, Mongolia has 38 universities (in which 14 are public, 21 are private, 3 are of branch of foreign universities).

In terms of training scales, in 2017-2018, there are 155124 university students. Let's see some statistic of higher education (Table1-3).

Table 1. Number of student higher education

Academic year	Sum	Advanced diploma	Bachelor	Master's	Doctorate
2013-2014	174,075	-	152,708	18,063	3,304
2014-2015	178,295	-	155,839	19,065	3,391
2015-2016	162,626	-	140,296	19,005	3,325
2016-2017	157,138	-	133,223	20,066	3,849
2017-2018	155,248	124	130,484	20,345	4,295

Table 2. Number of student for higher education /2017-2018 academic year /

Academic year	Sum	Bachelor	Master's	Doctorate
Male	83.1%	42.6%	37.6%	42.0%
Female	16.9%	57.4%	62.4%	58.0%

Table 3. Number of graduates (by degrees of education)

Year	Master's	Doctorate
2012-2013	3697	131
2013-2014	3996	118
2014-2015	5254	106
2015-2016	4859	136
2016-2017	3772	113

In 2017-2018, the total enrollment for a doctoral education at universities and institutes is 4295 (a 446 increased from 2016-2017).

In the 2017-2018 academic year, Mongolian universities have a few doctoral programs for environmental and applied-environmental fields (which 6 are of Mongolian National University; 4 are of Mongolian State University of Education; 3 are of Khovd State University). Let's see some information for education:

- ~ “National Qualifications Framework of Mongolia” project. Mongolia aims to create and implement National Qualification Framework for the two main purposes. These include:
 - ✓ Establish and enforce national-level and internationally recognized training standards;
 - ✓ Recognize all forms of learning by acquiring knowledge and skills.
 - ✓ Doctoral training is at the 10th level (of 10) of the national qualification framework of Mongolia.
- ~ “Higher education reform project” of ADB. The project impact will be an increased number of Mongolia's globally competitive higher education graduates responsive to labor market demands Implementation Period (Higher education reform project). Outcomes of project are: improved quality and enhanced relevance of higher education programs, strengthened management, financing, and governance of higher education institutions and improved access to higher education.
- ~ Financing. On the international level 7-10 percent of the tertiary education budget is spent on research, while 2.7 percent is spending on it in our country (Ministry of education, culture, science and sports).

This study initially examines doctoral education entities in Vietnam to develop supportive solutions to improve doctorate programs for environmental and applied-environmental fields, as well as encouraging the integration of environmental knowledge, policy, technology, and management into trainings and decision-making processes.

Research methodology

There are two partners from Mongolia in INTENSE project. Herein:

1. National University of Mongolia P8
2. Khovd State University P9

P8 is situated in capital of Mongolia, and P9 is located in the western region of Mongolia. Which means, educational and research development is different. Due to lack of organizations for environmental education development in western region, personal information based the questionnaire survey was conducted by Khovd State University.

P9 collected data from 20 people who have Ph.D degree (n=20, m=8, f=12) and who are working at environmental related organizations such as Environment and Tourism Authority of Khovd aimag, and Khovd State University. We used quality and quantitative research method. Responses are collected via sending survey questionnaires and interview.

In the capital of Mongolia, there are several state and private universities and institutions, which are dealing with environmental education and issues. Among them, 5 important organizations (4 state universities and 1 institute) selected for institutional information based the questionnaire survey, and the survey were conducted via personal meeting and phone call.

1. National University of Mongolia
2. Mongolian University of Science and Technology
3. Mongolian National University of Education
4. Mongolian University of Life Sciences
5. Mongolian Academy of Sciences

Results and discussions

The results from the survey on the limitations of the doctoral education programs in Mongolia mainly identify the following issues (Table 4): See Appendix a.

Table 4. SWOT analysis after survey

Strengths	Weaknesses:
<ul style="list-style-type: none"> ~ Aims to develop higher education ~ Developing NQF of Mongolia ~ INTENSE/ERASMUS+ project in 2 universities 	<ul style="list-style-type: none"> ~ The university system is not well established ~ Lack of financial supports for doctoral students, especially in applied researches ~ Programs and curricula of doctoral education has not been standardized ~ No online training at international level ~ Programs and curricula of doctoral education has not been standardized ~ Improve the human resource skill of professor's ~ Lack of research innovation ~ Professorship didn't develop ~ Student's foreign language skill is not good enough /language barrier/ ~ No accredited curricula
Opportunities:	Threats:
<ul style="list-style-type: none"> ~ Facilitate the qualification of doctoral training to international level ~ Learn and apply for advanced countries' experience and approaches ~ Provide online training ~ Will improve the quality of training through joint programs ~ Develop human resource of doctoral training / Improve skill of doctoral teacher ~ Develop entrepreneur university ~ Review COP 	<ul style="list-style-type: none"> ~ Politics affects education ~ Accreditation of curricula ~ Lack of financing to research

Conclusions and recommendations

In conclusion, the survey results have initially summarized the contemporary limitations in doctoral program curricula, learning times, students, as well as the institutions and implementations of doctoral dissertations. This survey would be one of an essential foundation to develop specific solutions that can effectively improve the quality of doctoral education in Mongolia.

Limitation

The survey did not cover all Mongolian universities, academic institutions and doctors of environmental research.

Acknowledgement

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References

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2. Ministry of education, culture, science and sports. Retrieved from <https://mecss.gov.mn/page/41/>

Appendix A. Collected data of survey in Khovd aimag

Q1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?	
Answer	%
Proposes courses are different from research field	5
In some way, quality of doctoral training is not good	10
Depend of dissertation is not on scheduled time (Ph.D students spend delayed to depend)	20
The tuition fees are significantly higher than the size of the salary for employing - students	25
Participation of student is weak	15
Employing-students can't participate in full time in classroom learning	25
Need to orient the dissertation content to the social-economic demand and policy of the country	10
Need to enrich the content of curricula through the modern tendency of science, knowledge and methodology	10
Training activities are not sustainable	20
Some skilled person cannot participate in the doctoral program	25
No age limit of Ph.D student	5
There is insufficient laboratory equipment in the university	40
Found of payment for another institution's laboratory is not good enough	40
Improve the human resource skill of professor's	5
Need improve research innovation	25
Only researchers of research institution and university teachers learn to doctoral program	15
Professorship didn't develop	15

Q2. What are the specific issues with research training in the field of environmental management, policy and technology?	
Answer	%
Use approved research methods	5
Use ICT in research	5
Working with the team	5
The cost of the research and budgeting are needed	20
Lack of research materials and equipment	30
Programs and curricula of doctoral education has not been standardized	25
Need innovation of research result	20
Innovation of Interdisciplinary research	5
Focusing a research topic of innovation	10
Collaboration of professors / Joint research	5

Q3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?	
Answer	%
Need development of curricula	25
Provide online training	30
Developing outcome based learning and research	15
Consider doctoral training at government policy	10
Reconcile training policy to educational innovation	5
Suggest different ways and flexible payment condition of learn to doctoral program	5
Provide local discount	5
Share laboratory and equipment	5
Use common standard	5
Doctoral students need participate in research projects	5
Coordinate the research topic with country's development policy	5
Learn and apply for advanced countries' experience and approaches	5
Promoting results in research societies and developing R & D research	5
Provide theoretical and practical training	5
Publish article to international peer-reviewed journals	5

Q4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point	
Answer	%
A. Quality of Ph.D dissertation is improving	40
Spatial analyzes of long-term quantitative data and systems analysis on environmental have improved from the perspective of the methodology	5
It's good, because ability of use new methods in using, mapping and processing GIS	5
B. Quality of Ph.D dissertation is normal	20
C. Quality of dissertation is declining	40
The right solutions based on innovation and research result are not clear.	5
Will Improve the quality of training through joint programs	5
The criteria of depend is weak	10
Depend of dissertation in a foreign country is good	5
Order student's research topic from government	5
Fundraising of research costs of the study	5
Need training with non employing - students	5
Data analysis and academic level of research have been decreased	5

Q5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?		
	Answer	%
Major issues	Accreditation of curricula	10
	Overlap lesson in a doctoral program and doctoral programs	10
	Satisfaction of student	10
	Discount assistance to student	10
	Implementation methods and mechanisms of doctoral training	5
	Support university's training process, which developing doctoral program	5
	Content of the doctoral curricula	5
	Monitoring system of collecting data and fact by the student	5
	Ability to quantify space and time analysis by the student	5
	Acceptable internationally	15
	Ability of graduate doctors	10
	Field trips are more important than classroom's lessons	5
	Comparing and analyzing international training and research	15
Criteria	evaluation of reality of research	5
	Reliability of research results	10
	Outcome of the research	5
	Real and practical solution to a real problem	10
	In other countries, allow the quality of the dissertation	10
	Research methodology's skill of student	10
	Benefit of research in science and society/ solution of result to the scientific development/	40
	Learning situation and attitude of student	10
	Improvement of learner's knowledge and skills	10
	Foreign language skill	5
	Number of student's and professor's publication of international peer-reviewed journals	35
	The needs of the research results in society	5
	Acceptable internationally	15
	Statistical processing	5

Q6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?	
Answer	%
Programs and contents are unstable	10
Accreditation of doctoral curricula	25
Lack of discount assistance to student	20
Lack of information exchange of institutions	15
The topic of the research work is not selected as a priority issue	10
Lack of introducing research result in practice	5
Focus more on student's research	5

Determine problem of time of student's depend	5
No E-learning	5
Coaching for the student is weak, because the cost of professor's the doctoral studies is low	25
The content and quality of curricula are seems down level from international standards	15

Q7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?

Answer	%
To support doctoral training with government policy	25
Need common standard in the country	5
Develop human resource of doctoral training / Improve skill of doctoral teacher	35
Improve foreign language skill of student	10
Partnership of institutions	5
International accreditation of curricula	5
Monitoring of cooperation and communication between organization	5
Need to improve joined program and partnership of institutions	10
improve and compare with advanced international methodology	5
Organize training at a higher level	5
Support the professor's Team	5
Improve the assessment methodology of the student's research	5
Provide scholarships for doctoral students	10
Adapt training to modern trends	5
Need development of laboratory equipment	5

Q8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?

	Answer	%
General skill	Research method	45
	Advanced competency of the theoretical industry	5
	Thesis writing	15
	Foreign language	20
	Using ICT in research	15
	Fulfill the research performed	20
	Basic skill and attitude of human	5
Subject	Mathematic statistic	25
	Climate change	5
	Green economy	5
	Economy of ecology	5
	Simulation of eco systems	5
	Human ecology	5
	Equipment's analysis	5
	Evaluation method	5
	Policy and planning of environment	5
	Statistical modeling	5
	Research methodology of natural science	5
	Writing style of research publication	25
	Research innovation	5
	Using software in data processing	5

Q9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:

Answer	%
Quality of provision, contents and relevance of Ph.D courses	30
Joint research, supervision, publications and/or use of equipment and/or experimental facilities	70
Virtual and physical mobility of Ph.D students	35
Quality assurance and peer review	25
Networking and knowledge and data exchange	45
Uninterruptable attendance of student at research seminars of institutions	20
Agree of joined the program	5

Q10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?	
Answer	%
Clarify the requirements, programs and standards	25
Grant programs and scholarship	45
Flexible forms of doctoral training	30
Academic staff with doctor's degree	15
Partnership of institutions and PPP	45
Develop entrepreneur university	15

Q11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)	
Answer	%
Research methodology of science research	10
English in science	5
Pressing issue of environment and management	25
Sustainable development and research	35
Innovation of research	15
Climate change and research	25
Green economy	5
Economy of ecology	10
Simulation of eco system	35
Human ecology	5
Data analysis	5
Global content	5
Education of sustainable Development	25
Problem of climate change	25
Environmental policy and planning	15
Socio-economic planning and policy	5
Research methodology of natural science	35
Air pollution	20
Waste management	10
Data processing of research	25

Appendix b. Some fact of survey /questionnaire/ in Khovd aimag

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KHOWD STATE
UNIVERSITY

Монгол, Вьетнам, Украин улсуудын Хүрээлэн буй орчны чиглэлийн докторын сургалтын
судалгаа, сургалтанд оролцож буй байгууллагуудаас авах судалгаа

Судалгаанд оролцож буй байгууллагын мэдээлэл: *хоту их сургууль*
Судалгаанд оролцож буй байгууллага: *хоту их сургууль*
Судалгаанд оролцож буй байгууллагын хаяг: *хоту аймаг нидерланд сул.*
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Холбоо барих хүний утас: *99439775*

Асуулга

- Одоогийн хэрэгжиж байгаа докторын сургалтын гол дутагдалыг та юу гэж бодож байна вэ?
 - *Суралцсанг амтд суух нэгжээ багасч*
болохгүй.
 - *Суралцсанг оролцох нэгж багасч.*
- Хүрээлэн буй орчны менежмент, бодлого технологийн салбар дахь сургалтын судалгаатай холбоотой онцлох тулгамдаж буй асуудал юу вэ?
 - *Докторын тооног тооцооноос*
 - *Суралцсанг амтд багасч байна.*
 - *Ур дүнд практикт нэвтрүүлж буйгаар*
- Одоогийн тогтолцооны хүрээнд докторын сургалтын зохион байгуулалт, агуулгыг сайжруулахын тулд авч хэрэгжүүлэх гол арга хэмжээ юу вэ?
 - *Докторын сургалтанд нэгжээ нэвтрүүлж,*
агуулгыг амтд байх
 - *Суралцсанг амтд, практикт нэвтрүүлж*

4. Таны бодлоор хүрээлэн буй орчин судлалын докторын диссертацийн чанар сайжирч байна үү? Буурч байна үү? Хэрэв буурч байгаа бол өөрийн үзэл бодлоо тайлбарлана үү?
 - Диссертацийн голор буурч бие.
 - зорилго, хамгаалагч диссертацийн голор сайн дураар.
 - (хэрэгсэл хамгаалагч биед, хэрэгсэл, үнэм)
 - ийтийн судалгааг амжилт голор сайн дураар.
5. Докторын сургалтын явц дахь чанарын баталгаатай холбоотой гол асуудлуудыг тодорхойлно үү? Докторын сургалтыг үнэлэхийн тулд хэрэглэгдэх шалгуур үзүүлэлтийг жагсааж бичнэ үү?
 - докторын хөтөлбөрийн агуулга, боловсруулалт
 - сургалтын голор үнэм
6. Докторант оюутнуудад одоогийн санал болгож буй сургалтын агуулга, чанар, байгууллагуудтай холбоотой асуудлуудыг тодорхойлно үү.
 - сургалтын агуулга, голор сайн дураар.
 - судалгааг амжилт үнэм практик хөтөлбөр.
 - судалгааг амжилт үнэм практик олон нийтийн
 - бей-интернет, бей-интернет бей-интернет хамгаалагч, зорилго
 - бей-интернет бей-интернет бей-интернет бей-интернет
7. Одоогийн тогтолцооны хүрээнд докторант оюутнуудад санал болгож буй хөтөлбөрийн агуулга, чанар, байгууллагыг сайжруулахын тулд юу хийх боломжтой вэ?
 - хөтөлбөрийн боловсруулалт, голор сайн дураар
 - докторын сургалтын үнэм зорилго бей-интернет
 - голор карьерт нийтлүүлэх олон нийтийн нийтлүүлэх
 - докторын хөтөлбөрийн агуулга олон нийтийн нийтлүүлэх
8. Докторант оюутнууд болон төгсөгчдийн судалгааны ажил ба бүтээлээ амжилттай хийж гүйцэтгэхэд шаардагдах ерөнхий чадвар, түүнд хамаарах хичээлүүдийг нэрлэ.
 - бей-интернет карьер
 - үнэм карьер боловсруулалт дүнхит карьер (судалгааг)
 - судалгааг үнэм карьер боловсруулалт, нийтлүүлэх (бей-интернет)
 - бей-интернет карьер боловсруулалт (бей-интернет)
9. Докторын зэрэг олгож байгаа сургуулиудын хоорондын хамтын ажиллагааны ямар хэлбэр нь докторын сургалтын чанарыг дээшлүүлэх вэ?
 - Докторын сургалтын голор сайн дураар
 - хөтөлбөр амжилтаар хэрэгсэл (практик, үнэм)
10. Хэрэв докторын сургалт үндэсний хэмжээний сургалтын байгууллагад төвлөрч явагддаг гэвэл (боловсролын бэлтгэл, чанарын баталгааг оролцуулан) тухайн сургалтын байгууллагын хүлээгдэж буй үйлчилгээ нь юу байх вэ?
 - Докторын сургалтын голор, үнэм бей-интернет карьер
 - хөтөлбөр хөтөлбөр - үнэм үнэм амжилтаар докторын
 - сургалтын хөтөлбөр хөтөлбөр
11. Хүрээлэн буй орчны бодлого, менежмент, технологийн чиглэлийн докторын сургалтын хичээлийн хамрах хүрээг юу гэж тодорхойлох вэ? /түлхүүр хичээл, түлхүүр үгийг тодорхойлж бичнэ үү./
 - практик карьер
 - хөтөлбөр амжилтаар карьер
 - бей-интернет карьер карьер
 - карьер карьер карьер

Appendix C. Collected data of survey in Ulaanbaatar city

Q1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?		
Answer	n	%
There is no funding system for PhD research.	1	16.6
No national scholarship for PhD study.	1	16.6
Interdisciplinary research is weakly developed.	1	16.6
A person, who has a full-time job, can't participate in full-time in classroom learning.	1	16.6
Laboratory facilities are not enough.	1	16.6
MAS does not have a permission to conduct PhD study. Only universities have it. In China, university and science institutes, both can conduct PhD study. We need this kind of system.	1	16.6

Q2. What are the specific issues with research training in the field of environmental management, policy and technology?		
Answer	n	%
PhD defense committee consists of 15 people, who are representing various science fields.	1	20
Lack of research funding.	1	20
Interdisciplinary research is most important.	1	20
There is support on paper publication in the international journal.	1	20
MAS has a lot of laboratory capacity and research experiences in different scientific fields. University has more experience on teaching. We should combine these capacities.	1	20

Q3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?		
Answer	n	%
This centralized system should change to the decentralized system, means each state university can have their PhD defense committee.	1	20
National and international scholarship (tuition fee + living cost + research cost) needs to develop	2	40
Only National University of Mongolia requires publishing paper in an international journal which listed Web of Science. This requirement should implement in all universities	1	20
Establish joint agreement on capacity sharing	1	20

Q4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point		
Answer	n	%
Quality of PhD dissertation in environmental studies is improving	5	100

Q5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?		
Answer	n	%
Percentage of research in the curriculum	1	7.7
Capacity and number of research laboratory	4	30.8
Amount of fund for PhD research	2	15.4
Publication	3	23.0
Professors ability	1	7.7
Number of successful graduated students	1	7.7
Number of enrolled students	1	7.7

Q6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?		
Answer	n	%
PhD program is not accredited	1	14.2
There is no inter-university PhD program	1	14.2
All professors have very high experience in a different environmental field	1	14.2
Good international and national collaboration	1	14.2
There is no e-learning and distance learning facility	1	14.2
Mid-term discussion at a department level is few	1	14.2
Field study	1	14.2

Q7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?		
Answer	n	%
National and international accreditation need to be done	2	40
National and international scholarship (tuition fee + living cost + research cost) needs to develop	2	40
Collaboration between university and research institute.	1	20

Q8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?		
Answer	n	%
Statistics for environmental study	1	11.1
Academic research skill	1	11.1
Urban environmental issues and its solution	1	11.1
Critical thinking	1	11.1
Climate change adaptation	1	11.1
Green economy	1	11.1
Environmental policy of banking system	1	11.1
Field work skill in different environment	1	11.1
Presenting skill	1	11.1

Q9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:		
Answer	n	%
Quality of provision, contents and relevance of PhD courses	1	10
Virtual and physical mobility of PhD students	1	10
Quality assurance and peer review	1	10
Joint research, supervision, publications	2	20
Shared equipment and/or experimental facilities	2	20
Networking and knowledge and data exchange	2	20
Joint or 2+2 doctoral program can improve inter-institutional cooperation	1	10

Q10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?		
Answer	n	%
Online study needs to develop	1	12.5
National and international scholarship (tuition fee + living cost + research cost) needs to develop	3	37.5
English in science	1	12.5
How to write a good paper	1	12.5
Academic skill, including information search	1	12.5
Consultation on quality assurance	1	12.5

Q11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)		
Answer	n	%
Environmental statistics	2	18.2
Academic research skill	1	9.1
Environmental policy and management of international organizations	1	9.1
Environmental science	1	9.1
Environmental engineering	1	9.1
Scientific theory and its application	1	9.1
Industrialization and environment	1	9.1
Climate adaptation	1	9.1
Water related issues	1	9.1
Soil quality issues	1	9.1

Appendix D. Ulaanbaatar survey sheetsCo-funded by the
Erasmus+ Programme
of the European Union**SURVEY OF INSTITUTIONS INVOLVED IN DOCTORAL STUDIES AND RESEARCH
TRAINING IN THE FIELD OF ENVIRONMENT IN MONGOLIA, UKRAINE AND
VIETNAM**

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Questionnaire

1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?

There is no funding system for PhD research, and no national scholarship for PhD study in Mongolia.

2. What are the specific issues with research training in the field of environmental management, policy and technology?

PhD defense committee consists of many people, 15 who are representing various science fields.

3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?

Recently, only one PhD defense committee was established by Ministry of Education and Science. This centralized system should change to the decentralized system, means each state university can have their PhD defense committee.

4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point.

In 2015, the university gets special permission to enter online scientific databases such as EBSCO, Royal society, JSTOR, SPIE, Springer, etc. It gives really good chance to PhD students to enter an international scientific database, and to find most-recent publications, and learn state-of-art method. Therefore, quality of PhD dissertation in environmental studies is improving.

5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?

National and international accreditation need to be done. Main criteria:

- ~ Percentage of research in the curriculum.*
- ~ Capacity and number of research laboratory*

6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?

National University of Mongolia offers to PhD students "Environmental science" curriculum. This PhD program is not accredited. Within the curriculum, there are several study fields such as water, air and soil. Recently, there is no inter-university PhD program.

7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?

National and international accreditation need to be done.

8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?

Two subjects Statistics for environmental study, Academic research skill need to teach, and PhD students need to get this knowledge and skills.

9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:

- ~ *quality of provision, contents and relevance of PhD courses*
- ~ *virtual and physical mobility of PhD students*
- ~ *quality assurance and peer review*

10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?

Online study needs to develop.

11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)

Key subjects:

- ~ *Environmental statistics*
- ~ *Academic research skill*
- ~ *Environmental policy and management of international organizations*
- ~ *Other more specific subjects for water, forest, air, soil studies*

Scope:

Pollution, mitigation technology, assessment, policy, water, air, forest, soil, land, statistics

**SURVEY OF INSTITUTIONS INVOLVED IN DOCTORAL STUDIES AND RESEARCH
TRAINING IN THE FIELD OF ENVIRONMENT IN MONGOLIA, UKRAINE AND
VIETNAM**

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Questionnaire

1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?

Interdisciplinary research is weakly developed.

2. What are the specific issues with research training in the field of environmental management, policy and technology?

Lack of research funding.

3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?

Most of PhD students pay their tuition fee, and they are studying beside of their job. This situation affects to research quality and study period. Therefore, national and international scholarship (tuition fee + living cost + research cost) needs to develop.

4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point.

Quality is getting better. Numbers of PhD student in environmental studies are increasing.

5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?

National and international accreditation need to be done. Main criteria:

- ~ Amount of fund for PhD research*
- ~ Availability of scholarship*

6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?

MUST offers "Geo-ecology" program to a person who wants to study in a field of environment. The program has 5 years history, and all professors have very high experience in a different environmental field. It also has good international and national collaboration. PhD student will be supervised by one or two professors and there are 7 laboratories that student can work.

7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?

National and international scholarship (tuition fee + living cost + research cost) needs to develop.

8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?

Poor urban development can cause of a lot of environmental problem which related to the human health. Therefore, a subject "Urban environmental issues and its solution" can add.

9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:

- ~ joint research, supervision, publications*
- ~ shared equipment and/or experimental facilities*
- ~ networking and knowledge and data exchange*

10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?

National and international scholarship (tuition fee + living cost + research cost) needs to develop.

11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)

Key subjects:

- ~ Environmental science*
- ~ Environmental engineering*

Key words:

Pollution prevention technology, industrial environment such as oil refinery, metallurgy, cashmere processing factory

**SURVEY OF INSTITUTIONS INVOLVED IN DOCTORAL STUDIES AND RESEARCH
TRAINING IN THE FIELD OF ENVIRONMENT IN MONGOLIA, UKRAINE AND
VIETNAM**

Information of surveyed institute: **Mongolian National University of Education**
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Questionnaire

1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?

A person, who has a full-time job, can't participate in full-time in classroom learning.

2. What are the specific issues with research training in the field of environmental management, policy and technology?

Interdisciplinary research is most important. Because of, environment itself is interdisciplinary science.

3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?

Provide some research grant for PhD student.

4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point.

Year by year, quality of PhD study is improving. Because of, good young professors are coming from overseas.

5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?

Main criteria:

- ~ Publication
- ~ Laboratory capacity
- ~ Professors ability

6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?

There is no e-learning and distance learning facility. Therefore, PhD student must come at the university to attend class. This is not a good choice to people who have a full-time job.

7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?

There is some support from the government level such as a stipend of PhD student.

8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?

Critical thinking is an important skill that PhD student should have. Therefore, this kind of subject should include PhD curriculum.

9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:

Joint or 2+2 doctoral program can improve inter-institutional cooperation.

10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?

PhD grant for their research.

11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)

Key subjects:

- ~ English in science*
- ~ How to write a good paper*
- ~ Academic skill, including information search*

Key words:

Modeling, geo-statistic, environmental mitigation measures

**SURVEY OF INSTITUTIONS INVOLVED IN DOCTORAL STUDIES AND RESEARCH
TRAINING IN THE FIELD OF ENVIRONMENT IN MONGOLIA, UKRAINE AND
VIETNAM**

Information of surveyed institute: **Mongolian University of Life Sciences**
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Questionnaire

1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?

Laboratory facilities are not enough.

2. What are the specific issues with research training in the field of environmental management, policy and technology?

There is support on paper publication in the international journal. When PhD student receives an acceptance letter from the editor of the journal, the student needs to choose open access (have to pay minimum 1000 USD) or free publication (student needs to wait the minimum a year). Therefore, if a student shows an acceptance letter that university shall pay.

3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?

Recently, only National University of Mongolia requires publishing paper in an international journal which listed Web of Science. This requirement should implement in all universities.

4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point.

Due to very tight requirement, it is improving.

5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?

Main criteria:

- ~ Publication*
- ~ Laboratory capacity*
- ~ Number of successful graduated students*
- ~ Number of enrolled students*

6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?

Mid-term discussion at a department level is few. It also affects the quality of research and dissertation.

7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?

National and international accreditation

8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?

- ~ *Climate change adaptation*
- ~ *Green economy*
- ~ *Environmental policy of banking system*

9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:

Data sharing, common laboratory

10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?

Research grant for PhD student

11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)

Key subjects:

- ~ *Scientific theory and its application*
- ~ *Statistical method to analyze environmental data*

Key words:

Applied statistics, data analysis and interpretation, remote sensing and geographic information system

**SURVEY OF INSTITUTIONS INVOLVED IN DOCTORAL STUDIES AND RESEARCH
TRAINING IN THE FIELD OF ENVIRONMENT IN MONGOLIA, UKRAINE AND
VIETNAM**

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Questionnaire

1. What are the most important, in your opinion, gaps in the existing national system of doctoral studies in general?

MAS does not have a permission to conduct PhD study. Only universities have it. In China, university and science institutes, both can conduct PhD study. We need this kind of system.

2. What are the specific issues with research training in the field of environmental management, policy and technology?

MAS has a lot of laboratory capacity and research experiences in different scientific fields. University has more experience on teaching. We should combine these capacities.

3. What are the most important measures that can be taken, under the existing framework conditions, in order to improve the organisation and contents of doctoral studies?

Establish joint agreement on capacity sharing and give an opportunity to Institute scientists to teach at the PhD level.

4. In your opinion, is quality of PhD dissertation in environmental studies improving or declining? If it is declining, then please, briefly explain your point.

It is a different case by case. Generally, it is improving.

5. Do you recognise any major issues with the quality assurance in the process of doctoral training? Could you list the criteria / indicators that can be used in order to evaluate doctoral training?

Main criteria:

- ~ Publication*
- ~ Laboratory capacity*

6. Do you recognise any issues with the organisation, quality and/or contents of training currently offered to PhD students?

In the environmental field, one of the important things is a field work. Therefore, field study should include in the content of the training.

7. Is there anything that can be done under the existing framework conditions, in order to improve the organisation, quality and/or contents of training currently offered to PhD students?

Collaboration between university and research institute.

8. Any subject-related or general skills the PhD students and graduates are missing in order to make successful research careers and/or to complete their theses?

- ~ *Field work skill in different environment*
- ~ *Presenting skill*

9. What forms of cooperation between PhD awarding (or providing doctoral training) institutions would improve the quality of doctoral studies at your institution and nationwide? In particular, in terms of:

Collaboration between university and research institute.

10. If doctoral training (including the educational provision and quality assurance) would be provided and/or coordinated by a nationwide organisation (e.g. the doctoral school in environmental studies), what services would expect this organisation to deliver?

Consultation on quality assurance

11. How would you define the subject scope of a doctoral school in environmental management, policy and technology? (please, define key subjects / key words)

Key subjects:

- ~ *Water related issues*
- ~ *Climate adaptation*
- ~ *Soil quality issues*
- ~ *Industrialization and environment*