

# Guidelines for Fieldwork Activities in Environmental Geography: A Case Study of the East of Thailand

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## Abstract

Geography is an interdisciplinary subject which can be divided into three areas: physical geography, human geography, and geographical techniques. Fieldwork is considered a crucial element of the fact-discovery process and a path to understanding relationships between the physical dimension and human activities. This paper has two objectives: first, to explore suitable geographical fieldwork sites; second, to create guidelines for geographical fieldwork activities. This paper conducted surveys as the main methodology. All 8 provinces across the East of Thailand were selected as the study area. These provinces are diverse in physical landforms and human activities. The results showed that 23 sites are suitable for environmental geography fieldwork activities. The outcomes of this paper can be divided into two parts; the first outlines the building of a spatial database from fieldwork sites by using the Geographic Information System (GIS) technique. The second part presents an analysis of geographical fieldwork activities. Furthermore, deeper analysis suggests that significant environmental geography knowledge from the fieldwork can be divided into two areas: physical geography and human geography. The former focuses on physical landforms, geology, natural resources, and the environment. The latter involves people-environment relationships from the sites and their surrounding areas. In conclusion, this research explores the importance of geographical studies, fieldwork research and the use of appropriate tools for data acquisition.

**Keywords:** Fieldwork, Geography Study, Practices, Undergraduate, East of Thailand

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## 1. Introduction

Geography is an interdisciplinary subject between arts and sciences. Cambridge Advanced Learner's Dictionary & Thesaurus defines that "Geography is the study of the systems and processes involved in the world's weather, mountains, seas, lakes, etc. and of the ways in which countries and people organize life within an area" (Cambridge University Press 2019). Environmental geography is also part of geography that studies the relationships between the physical environment, humans and societies. Thus, environmental geography requires collaboration between physical and human geographers (University of Melbourne, School of Geography 2020). From this perspective, environmental geography is a good platform for geography students to understand the relationships between physical characteristics and human activities.

Fieldwork skills are invaluable assets for geography students. Philips and Johns (2012) state that geography fieldwork is a compulsory element for geography students because it occupies an important place within academic and professional geography. At present, geography teaching in Thailand has placed more focus on reinforcing students in geography to practice geographic skills through classes or practical lessons outside the classroom. Field research, or field studies, is a process of data collection outside a workplace setting. The data consists of visible data collection and invisible data collection. All collected data are important for describing geographical phenomena from the study area (Pongsri 1997). Field studies lead to an improved understanding of geographical phenomena from that study area. Dunphy and Spellman (2009) state that fieldwork in geography may be beneficial to students, not only in the aspect of physical geography, but also in the aspect of human geography. Students will acquire more knowledge in geography more than they could do so from a classroom.

Hence, this research aimed to develop guidelines for empirical learning activities in environmental geography in the East of Thailand. This region represents a variety of geographical features and can provide good field study sites for students. In addition, the geographical field study from this research can support development of geographic skills for undergraduate-level students, including first-year-students, second-year-students, and third-year-students, who read geography.

## 2. Objectives

1. To explore suitable geographical fieldwork sites in order to create guidelines for geographical fieldwork activities.
2. To create guidelines for geographical fieldwork activities in environmental geography.

### 3. Literature Review

#### 3.1 Importance of Fieldwork Practice in Environmental Geography

As stated above, geography is a subject that seeks answers for questions of why things are as they are. The subject considers characteristics of places, especially in their natural environment and people, as well as the relationships between the two (Johnston 2019). Scott, Fuller, and Gaskin (2011) defines fieldwork as any study of the environment that takes place outside the classroom. Fieldwork is one of the teaching methods in geography to promote students' understanding of the relationship between the environment and people in real situations.

Fieldwork methods in geography are vital studying approaches that geography lecturers should take into an account. As Hope (2009, 169) states, "Human geography fieldwork is important ... it helps develop subject-specific and transferable skills, promotes 'active learning' and links theory to 'real world' examples in a 'spiral of learning'". However, fieldwork practice in terms of teaching and assessment is being challenged for geographic studies (Kent, Gilbertson, and Hunt 1997). Thus, field trips have been acknowledged as geography learning enhancement and valuable learning experiences in geography study (Krakowka 2012).

Frew (1999, 4) states, "fieldwork is the discovery part of geography because it involves 'going out and finding out'... it is the way geographers have done for centuries and it is the way in which our geographical knowledge of the world has been built up". Hence, the more geographical fieldwork skills are practiced, the more geographical phenomena in certain areas are understood by geographers.

#### 3.2 Guidelines for Study Approaches in Environmental Geography in the Thai Context

The Office of the Basic Education Commission, Ministry of Education (1998) states that teaching in social studies aims at the promotion of good citizenship. Teaching in geography should focus not only on geography content, but also on development of geographical skills. Geographical study approaches should address geographical skills in class. Guidelines for studying approaches in geography will be discussed in 4 topics as follows:

The first topic is project-based learning. Instructors will be facilitators for students, aiming to develop their projects, which are built up by their interests. For example, students may be interested in a 'local tourism project'. Instructors can guide them how to collect data and where to find the data. Then, a field study may require more data acquisition such as physical features (e.g. urban planning, transportation network, location of tourism sites) and human activities (e.g. local economic characteristics, local products, and local souvenirs) in the area. Then, project presentation could be made in order to assess their project.

The second topic is field study-based learning. Here, instructors may take students out for an excursion in order to encourage them to see, to hear, and to touch directly. Students will gain benefits from studying in real-world contexts. Some geographical skills can be imparted to students while they are in the field such as note-taking, observation, making maps or directory, and data analysis.

Third, we discuss survey-based learning. Instructors may assign students to survey their local area for both physical features (e.g. landform, natural resources) and human activities (e.g. population distribution, career). Students may be assigned to take notes while they are in the field and/or to produce some graphic data in order to represent geographical characteristics of the area such as maps, graphs, data tables, or photographs.

Forth, map-drawing activity. Instructors should encourage students to practice map skills such as drawing school maps and community map. In addition, studies of map components, map interpretation, and map usage should be promoted to increase their geographical skills. These skills may lead to more understanding of geographical phenomena in the study areas and raise deeper awareness of the local environment.

## 4. Research Methodology

### 4.1 Research Tools

4.1.1 Recording devices (e.g. voice recorder, video recorder, digital camera)

4.1.2 Maps (e.g. geological map, topology map, soil map)

4.1.3 Satellite images

4.1.4 Arial photographs

4.1.5 Global positioning system (GPS)

### 4.2 Research Procedures

Research procedures can be divided into five steps as shown in Figure 1 as follows:

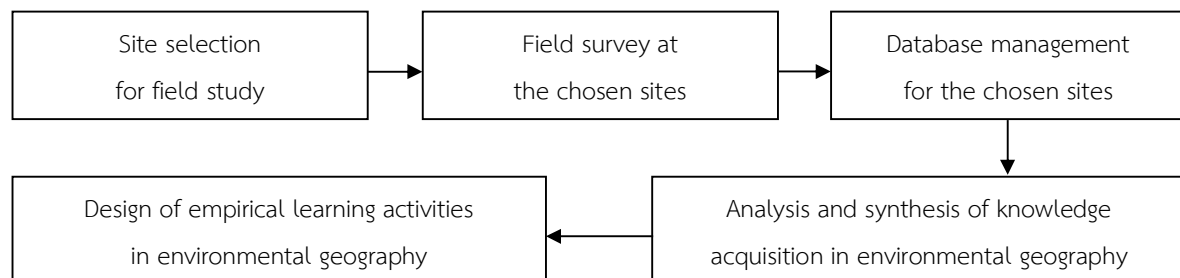


Figure 1 Research procedures

The first step was site selection for the field study. Data gathering that involves prominent geographical features in Eastern Thailand, were reviewed in order to select field study areas. This research selected 23 sites from 8 provinces across the region to represent a variety of prominent geographical features of this region. The locations of all the 23 sites are shown in Figure 2.

In the second step, a field survey was conducted at the chosen sites. This research employed explanatory survey research by focusing on data reliability, searching answers by using scientific approaches, and obtaining new knowledge by linking with previous answers (Chardsumon, 2010). A field survey at the chosen sites was made to survey prominent features at each site. Note-taking, photographs, location coordinates by GPS had been made to collect required spatial data from each site.

The third step concerned database management for the chosen sites. Datasets (e.g. location, prominent geographical features and guidelines for fieldwork activities) from the field survey were arranged to describe each site to create practices/activities that reflect the acquisition of environmental geography knowledge.

Forth, analysis and synthesis of environmental knowledge were performed. Database from each site was analysed to design any environmental geography knowledge that students should acquire from the sites.

In the last step, empirical learning activities in environmental geography were designed. Fieldwork activities were designed for studying environmental geography in the area. Due to a variety of geographical features in the East of Thailand, different field study activities and field study tools were designed for the chosen sites.

### **4.3 Study Area**

This research had selected the East region of Thailand (Figure 2) as the study area. The region was chosen as a study area for two reasons. First, this region has abundant geographical features: mountains, mountain range and flood plains in the middle of the region, coastal plains, beaches, and islands in the south. Second, this region has a variety of land-human activities such as commercial agriculture, industrial towns, domestic and international trading, tourism and recreational services. Thus, this region contains various prominent geographical features, including both themes of physical geography and human geography suitable for students to study environmental geography.

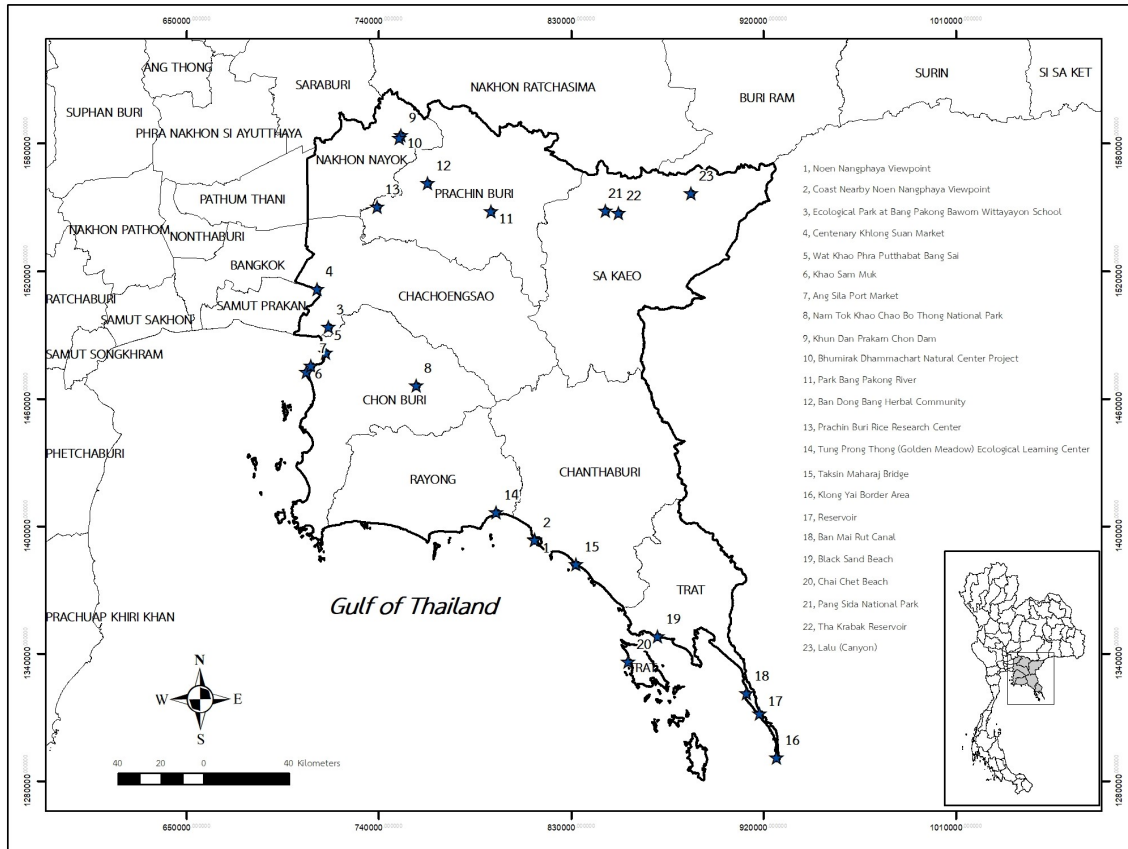


Figure 2 Study area

## 5. Results

### 5.1 Database Management from Field Study

Database management is an important part of this study. The database from this study can describe suitable location sites from the study. The database from the survey was derived from various resources such as the topological map (scale 1:50,000) from the Royal Thai Survey Department, tourist maps, Landsat satellite images, and GPS for an indication of the location on the Earth.

This research had collected 23 geographical fieldwork sites. All of the sites represent a variety of environmental geographic features of both physical and human interaction aspects. Details of the locations from all sites are shown in Table 1 and Figure 2.

Table 1: Attribute from field study sites

Province	UTM zone	X	Y	Field Study Sites
Chanthaburi	47P	813105.00	1393625.00	1. Noen Nangphaya Viewpoint
	47P	813203.00	1393438.00	2. Coast Nearby Noen Nangphaya Viewpoint
	48P	180303.00	1381859.00	3. Taksin Maharaj Bridge
Chachoengsao	47P	716452.91	1493713.98	4. Ecological Park at Bang Pakong Baworn Wittayayon School
	47P	711359.51	1511253.86	5. Centenary Khlong Suan Market
Chon Buri	47P	715306.00	1481462.00	6. Wat Khao Phra Putthabat Bang Sai
	47P	706244.00	1472483.00	7. Khao Sam Muk
	47P	708371.00	1475290.00	8. Ang Sila Port Market
	47P	757560.33	1466089.03	9. Nam Tok Khao Chao Bo Thong National Park
Trat	48P	272044.00	1288855.00	10. Klong Yai Border Area
	48P	264600.00	1309794.00	11. Reservoir
	48P	258633.00	1319389.00	12. Ban Mai Rut Canal
	48P	217740.00	1347026.00	13. Black Sand Beach
	48P	203711.00	1335295.00	14. Chai Chet Beach
Nakhon Nayok	47P	750515.33	1583811.70	15. Khun Dan Prakarn Chon Dam
	47P	749650.06	1582596.24	16. Bhumirak Dhammachart Natural Center Project
Prachin Buri	47P	792646.15	1547854.76	17. Park Bang Pakong River
	47P	763076.39	1561216.41	18. Ban Dong Bang Herbal Community
	47P	739299.30	1550134.19	19. Prachin Buri Rice Research Center
Rayong	47P	794990.00	1406251.00	20. Tung Prong Thong (Golden Meadow) Ecological Learning Center
Sakaeo	48P	198004.99	1547644.51	21. Pang Sida National Park
	48P	203995.75	1546398.25	22. Tha Krabak Reservoir
	48P	238162.14	1554777.85	23. Lalu (Canyon)

## 5.2 An Analysis and Synthesis of Environmental Geography Knowledge from the Field Survey

From the field survey, each field study site was classified into two main themes: physical geography and human geography (Table 2). The theme can be identified from prominent geographical

features from the areas. Then, the design for geographical activities in each theme was assigned for each site to acquire environmental geography knowledge.

**Table 2: Analysis and Synthesis of Environmental Geography Knowledge  
from the Field Survey**

Province	Field Study Sites	Main Themes	
		Physical Geography	Human Geography
Chanthaburi	1. Noen Nangphaya Viewpoint	/	
	2. Coast Nearby Noen Nangphaya Viewpoint	/	
	3. Taksin Maharaj Bridge	/	/
Chachoengsao	4. Ecological Park at Bang Pakong Baworn Wittayayon School	/	
	5. Centenary Khlong Suan Market		/
Chon Buri	6. Wat Khao Phra Putthabat Bang Sai	/	
	7. Khao Sam Muk	/	
	8. Ang Sila Port Market		/
	9. Nam Tok Khao Chao Bo Thong National Park	/	
Trat	10. Klong Yai Border Area		/
	11. Reservoir	/	
	12. Ban Mai Rut Canal	/	
	13. Black Sand Beach	/	
Prachin Buri	14. Chai Chet Beach	/	
	15. Khun Dan Prakarn Chon Dam	/	/
	16. Bhumirak Dhammachart Natural Center Project	/	
	17. Park Bang Pakong River	/	
Rayong	18. Ban Dong Bang Herbal Community		/
	19. Prachin Buri Rice Research Center	/	
	20. Tung Prong Thong (Golden Meadow) Ecological Learning Center	/	
Sakaeo	21. Pang Sida National Park	/	
	22. Tha Krabak Reservoir	/	
	23. Lalu (Canyon)	/	



### 5.3 Design of Empirical Learning Activities in Environmental Geography

This research aimed to design learning activities. Thus, a guideline for activities in each site was designed after conducting a field survey analysis as shown in Table 3. However, the activities fall into different levels, from basic to advance. Students must have basic knowledge of physical geography, particularly in geology, as well as human geography. In addition, basic skills for field study and the competency in using geographical tools will effectively reinforce experiential learning from field studies.

All geographical activities in the fieldwork sites had been designed for each student's educational level according to different objectives and skills of Bloom's taxonomy. For example, students studying year 1 geography should reach the understanding level (understand what a fact means), whereas those doing year 2 geography should acquire the application level (applying facts, rules, concepts, and ideas) and those in year 3 should obtain analytical skills (breaking down information into component parts). Each level of skills can represent the level of learning where students can follow. Samples of environmental geographical fieldwork activities are shown in Figure 3 and Table 4.

Table 3: Guidelines for Environmental Geography Fieldwork Activities.

Province	Fieldwork Sites	Guideline for Fieldwork Activities	Geographical Skill Requirement		
			Understanding	Applying	Analysis
Chanthaburi	1. Noen Nangphaya Viewpoint	■ Understanding of geological process	/	/	
		■ Recreational Area Management		/	/
	2. Coast Nearby Noen Nangphaya Viewpoint	■ Exploring of coastal ecology	/	/	
Chachoengsao	3. Taksin Maharaj Bridge	■ Map interpretation and ground check	/	/	
		■ Exploring the mangrove ecology	/	/	
		■ Exploring the community's economic activities (oyster farm, fish farm)		/	/
Chachoengsao	4. Ecological Park at Bang Pakong Baworn Wittayayon School	■ Exploring the mangrove ecology	/	/	/
	5. Centenary Khlong Suan Market	■ Exploring the community's economic activities		/	/
		■ Drawing a community map	/		
Chon Buri	6. Wat Khao Phra Putthabat Bang Sai	■ Exploring the igneous rock and its landform	/	/	
	7. Khao Sam Muk	■ Exploring the granite rock and its landform	/	/	
	8. Ang Sila Port Market	■ Exploring the community's economic activities		/	/
	9. Nam Tok Khao Chao Bo Thong National Park	■ Understanding of geological process	/	/	

Table 3: Cont.

Province	Fieldwork Sites	Guideline for Fieldwork Activities	Geographical Skill Requirement		
			Understanding	Applying	Analysis
Trat	10. Klong Yai Border Area	<ul style="list-style-type: none"> <li>■ Exploring the economic activities at border</li> </ul>		/	/
	11. Reservoir	<ul style="list-style-type: none"> <li>■ Understanding of geological process</li> </ul>	/	/	
		<ul style="list-style-type: none"> <li>■ Environmental problem investigation: water quality sampling</li> </ul>		/	/
	12. Ban Mai Rut Canal	<ul style="list-style-type: none"> <li>■ Environmental problem investigation: water quality sampling, community's solid waste management</li> </ul>		/	/
	13. Black Sand Beach	<ul style="list-style-type: none"> <li>■ Exploring the mangrove ecology</li> </ul>	/	/	/
<ul style="list-style-type: none"> <li>■ Understanding of black sand process</li> </ul>		/			
14. Chai Chet Beach	<ul style="list-style-type: none"> <li>■ Exploring the igneous rock landform and erosion process</li> </ul>	/	/		
Nakhon Nayok	15. Khun Dan Prakarn Chon Dam	<ul style="list-style-type: none"> <li>■ Map interpretation and ground check</li> </ul>	/	/	
		<ul style="list-style-type: none"> <li>■ Field sketching</li> </ul>	/		
		<ul style="list-style-type: none"> <li>■ Water utilisation planning</li> </ul>		/	/
	16. Bhumirak Dhammachart Natural Center Project	<ul style="list-style-type: none"> <li>■ Exploring the environmental management and reduction under King Rama 9's initiation</li> </ul>	/	/	/

Table 3: Cont.

Province	Fieldwork Sites	Guideline for Fieldwork Activities	Geographical Skill Requirement		
			Understanding	Applying	Analysis
Prachin Buri	17. Park Bang Pakong River	■ Exploring the origin of rivers	/	/	
		■ Study of discharge of streams		/	/
	18. Ban Dong Bang Herbal Community	■ Exploring the community's economic activities		/	/
		■ Drawing a community map	/	/	/
19. Prachin Buri Rice Research Center		■ Exploring relationships between physical factors and human activities		/	/
		■ Satellite images interpretation for agricultural land use		/	/
Rayong	20. Tung Prong Thong (Golden Meadow) Ecological Learning Center	■ Exploring the mangrove ecology	/	/	/
		■ Environmental problem investigation: water quality sampling	/	/	/
Sakaeo	21. Pang Sida National Park	■ Exploring the deciduous forest ecology	/		
	22. Tha Krabak Reservoir	■ Water utilisation planning		/	/
		■ Environmental problem investigation: water quality sampling	/	/	/
23. Lalu (Canyon)		■ Understanding of canyon landform	/		
		■ Map interpretation and ground check	/	/	/



Figure 3: Centenary Khlong Suan Market, Chachoengsao Province. May 28, 2018.

Table 4: Sample of Environmental Geography Fieldwork Activities at Centenary Khlong Suan Market, Chachoengsao Province.

Centenary Khlong Suan Market, Chachoengsao Province.	
<b>Topic:</b>	Centenary Market and Way of Life.
<b>Location:</b>	Centenary Khlong Suan Market, Chachoengsao Province.
<b>Learning Levels:</b>	Undergraduate Students: Freshers, Sophomores, Seniors
<b>Fieldwork duration:</b>	1.5 hour
<b>Fieldwork objectives:</b>	<ul style="list-style-type: none"> <li>▪ To draw a community map</li> <li>▪ To explore the community's economic activities</li> </ul>
<b>Fieldwork materials:</b>	<ul style="list-style-type: none"> <li>▪ Cameras</li> <li>▪ Community maps from secondary sources</li> <li>▪ Fieldwork note-taking form</li> <li>▪ Questionnaires, interview questions</li> </ul>
<b>Fieldwork directions:</b>	<ul style="list-style-type: none"> <li>▪ <i>Freshers</i>: students explored the community and drew a community map. Used appropriate colours, symbols and annotations in the map.</li> <li>▪ <i>Sophomores</i>: students designed questionnaires in relation to the understanding of the community's way of life (i.e. demography, local economy, environmental problems). Then, conducted questionnaires at the study site.</li> <li>▪ <i>Seniors</i>: students conducted in-depth interviews about the community's way of life (economy, social, environment conditions) at the site.</li> </ul>

Table 4: Cont.

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<b>Fieldwork outputs:</b>	<ul style="list-style-type: none"> <li>▪ <i>Freshers</i>: students presented their own community map. Described the community's details that they had observed from the site.</li> <li>▪ <i>Sophomores</i>: students processed and analysed questionnaire results.</li> <li>▪ <i>Seniors</i>: students analysed and evaluated data from their in-depth interviews.</li> </ul>
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## 6. Conclusions

This research explored suitable geographical fieldwork sites for the purpose of designing empirical learning activities for undergraduate students in the geography programme. This research showed that geographical fieldworks in all 23 sites can be classified into three main themes; physical geography, human geography and geographical techniques. In addition, this research also presented an overview of a spatial database from fieldwork sites. The diversity of physical landscapes from all fieldwork sites enabled a variety of geographical practice skills to be acquired for geography students.

The geographical fieldwork activities had been designed by taking into account the characteristics of individual fieldwork sites. The activities can be practiced in 3 skill levels (from basic skills for geography freshmen to advanced skills for geography juniors), following learning objectives provided by Bloom's taxonomy. Some fieldwork activities focused on the aspect of physical geography, while some were involved with human geography. However, this research attempted to integrate physical geography and human geography, applying geographical techniques as study tools in fieldwork activities. Guidelines for empirical learning activities have been designed from the prominent geographical features. Main fieldwork activities could be conducted such as taking notes, classifying information, field sketching, taking photos from the field, and drawing maps. In addition, such geographical tools can be applied in items such as a manual flow metre, multi-parameter equipment for water quality assessment, questionnaires and interviews.

To sum up, the research set out to address the importance of field studies for university students in the geography programme. It can be concluded that the design of fieldwork activities will benefit students in terms of skill development (transferrable and technical) (Fuller et al. 2011) as well as help enhance their learning experience of geographical theory and concepts (Krakowka, 2012).

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