The Role of Geography in Four Years Program (Diploma 4) at Land National Academy in Yogyakarta

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Abstract. One of the geography content is to study the connection among the physical phenomena and social phenomena, by spatial analysis. It is fit to the nature of land problem that faced by Land National Agency. This article shows the urge of geographical content in educating employees at Land National Agency. The method used is qualitative study, by observing geographical content from curricula of four years program at Land National Academy in Yogyakarta. Geography has strong role in land study. From the Land study learning outcomes, 50 % knowledge learning outcome are relevance to geography, and 53 % special skill learning outcomes related to geography. The proportion of credits that is learned, 32.5% credits at mapping Study Program in National Land Academy is Geography’s subject. In terms problem solving land problem, the employee often uses spatial analyses to understand the problem and make solution comprehensively. Geography is one of the backbones of land study. It can frame land study in terms of the analyses method or spatial approach, and conduct the right techniques to survey and mapping.

1. Introduction
As a vocational higher education institution, Land National Academy has curricula for applying sciences. So, it is important for lecturer to understand what the main supporting sciences as background. Knowing it, the lecturer can arrange the curricula more focus, they would help the student effectively and precisely for analysing the problem in the learning process. For the institutional education, it will be able to develop curricula in the right track.

The development needs land. There are many human interests on the land. As a development impact, the land problems are increased and complicated. Its problem involves various aspects, in the land study point of view the problems are not only physical, social, administrative, but also juridical problem. As an employee candidate, the student of Land National Academy must be able to handle those problems. So that, they have to be given the education that accommodate competence for applying or analysing which connecting between human and physical aspect. This is the strongly substantive relation between geography and land study. As we know, geography concerns to the dynamical human life and physical aspect. The research question is how the role geography for land study.
2. Methods
For showing the role of geography in preparing employees at Land National Agency, we framed this article in terms of (1) what geography and land study are (2) comparing both curricula, (3) how the geographical analyses contributing the problem solving in land problems. The three aspects can be explained as the following below.

Geography has some definitions, branches, and its analyses. It can also be known from the learning outcome at geographical study. In this research, it was practically used the curricula 2015 of geography study faculty of geography, the University of Muhammadiyah Solo (UMS) [2]. “Practically” means that the geography studies other university has curricula similarity with (UMS). Land study has two concentrations at Land National Academy [3]. The first is land management, and the last is mapping. In this research is chosen mapping concentration. The best description of Land Study we read the body of knowledge of a study program.

In curricula, there are subjects that qualitatively analyse the similarity of the subject, and count the proportion between geographical subject and non geographical subject. Non geographical subjects refer to the substantive category of knowledge; it might be laws, geodesy, land registration, and sociology.

We choose some research to know how the geography can help to comprehensively understand the land problem. Some problem can be the the problem of land registration, land use, land surveying, land dispute, or technology in survey and mapping.

3. Geography and land study
In the following, shortly it will be written about geography study program, land study program, and their subject. The programs are explained in terms of their curricula, and learning outcome.

3.1. Geography
Geography is the study of places and the relationships between people and their environments [1]. Geographers explore both the physical properties of Earth’s surface and the human societies spread across it. They also examine how human culture interacts with the natural environment and the way that location and places can have an impact on people. Geography seeks to understand where things are found, why they are there, and how they develop and change over time.

There are many scholars writing geography definition. Otherwise, mainly geography has two branches; human geography and physical geography; which both relating each other. Human geography concerns the understanding of the dynamics of cultures, societies and economies, and physical geography concerns the understanding of the dynamics of physical landscapes and the environment. Geography puts this understanding of social and physical processes within the context of places and regions - recognising the great differences in cultures, political systems, economies, landscapes and environments across the world, and the links between them. Understanding the causes of differences and inequalities between places and social groups underlie much of the newer developments in human geography.

Some information which are found from geography: the places and communities in which we live and work, our natural environments and the pressures they face, the interconnectedness of the world and our communities within it, how and why the world is changing, globally and locally; how our individual and societal actions contribute to those changes, the choices that exist in managing our world for the future, and the importance of location in business and decision-making.

There are some other sub disciplines of geography; geographic information systems (GIS), cartography, and geomantic. GIS deal with the storage of information about the Earth for automatic retrieval by a computer, in an accurate manner appropriate to the information's purpose. In addition to all of the other sub disciplines of geography, GIS specialists must understand computer science and database systems. Cartography studies the representation of the Earth's surface with abstract symbols (map making). Cartography has grown from a collection of drafting techniques into an actual science. Geomatic is concerned with the application of computers to the traditional spatial techniques used in
cartography and topography. Geomatic methods include spatial analysis, geographic information systems (GIS), remote sensing, and global positioning systems (GPS).

The curriculum of Geography Graduate Study Program (S1), the Faculty of Geography, University of Muhammadiyah Surakarta, Central Java Province, was made in 1985. The learning outcome of the program is divided into four categories; character and value, common skill, special skill, and mastery of knowledge. Character and value is not explained because of not substantive subject. The three outcomes are: (1) mastery of knowledge by means understanding the concept and approach, understanding the diversity of region, applying the spatial aspect to show the social, economic, cultural, and physical phenomena; competing look at the connection among social, economic, cultural, and physical object, and competing study of spatial distribution of regional resources, (2) the general skills are competence in conducting geospatial survey, analysis, and making decision by referencing the regional facts qualitatively or quantitatively, and (3) the special skills are competence in analysing and interpretation geographical phenomena by referencing maps, remote sensing image or non-image; using tools for analysing characteristic of regional recourses; and competence in presenting data using geographic information system.

3.2. Land study program
The Ministry of Agrarian Affairs and Spatial Planning/Land National Agency (ATR/BPN) Indonesia has specials higher education for preparing professional employee. There are two programs: Diploma I (one year program), and Diploma 4 (four years program). Diploma 4, all the student is civil servant, the employee of ATR/BPN. They are candidate preparing for middle management which competence not only to handle technical problem but also make a right decision policy. They are designed to be analyst. In contrast, diploma I is designed to product an operator, particularly in cadastral surveying. The program is focused on skill; how to operate a kind of measurement and mapping tools (compass, theodolite, roll meter, Global Positioning System, water pass, etc.). In this article, only the Diploma 4 will be explained in detail.

The learning outcome of Diploma 4 in 2014 consist of four categories; character, knowledge, general skill, and special skill. Six learning outcomes relating to knowledge are: (1) mastering the concept of various methods and techniques of surveying the basic geospatial information and thematic, (2) mastering the principles of state administrative law, constitutional law, customary law, civil law, civil procedure law and state administrative law and the concept of agrarian law, especially the law of the land, (3) mastering the principles of utilization of information technology, especially software applications data processing and land information, (4) mastering the paradigms and concepts of social diversity, and the culture of society, (5) mastering the principles and concepts of administrative functions especially related to land management, and (6) mastering the concept of the earth science related to the land.

Eight learning outcomes relating to general skill are: (1) capable to apply thinking in logical, critical, innovative, quality, and measurable in doing specific work in the land sector and in accordance with the standard of competence of work in land sector, (2) capable of showing independent, quality, and measurable performance, (3) capable to study the case of the application of science and technology in the land sector that pay attention and apply the value of humanities in accordance with the land sector in order to produce prototypes, standard procedures, design, arranging the results in the form of working papers, design specifications, and upload it; (4) capable to make informed decisions based on standard procedures, design specifications, safety requirements and job security in supervising and evaluating their work, (5) capable to maintain and develop network of cooperation and cooperation result inside and outside institution, (6) has the leadership to supervise and evaluate the completion of work assigned to an employee under his/her responsibility, (7) capable to be responsible for the achievement of team work result and able to do learning independently, and (8) capable of documenting, storing, securing, and rediscovering data to assure validity and prevent plagiarism.

Fifteen learning outcomes relating to special skill are: (1) capable to plan, execute and evaluate survey implementation, surveying for land use by using and utilizing various methods and instruments
of modern science technology-based mapping survey, in accordance with process and quality standards, (2) capable to process, analyse and evaluate data and information as documents in the framework of determining rights, land registration and granting of land permits in accordance with the provisions of laws and regulations by applying legal concepts and theories in accordance with process standards and quality, (3) capable to review regulations in determination of land rights, property rights over apartment units, use rights over space above, underground and aquatic space and submit its review as a consideration in policy making in of regulation and determination of rights, (4) capable of designing, implementing and developing land reform models with community empowerment approaches to improve people's welfare, (5) capable to arrange the design of community empowerment in the land sector; (6) capable of collecting, managing and processing data of ownership, use, utilization of land and presents in the form of textual and spatial information by utilizing methods and media based on the latest information technology, in accordance with process and quality standards, (7) capable of preparing document of land technical considerations in the framework of location determination, location permit and land use change permit, utilizing current information technology-based methods and media, in accordance with process and quality standards, (8) capable to compile balancing change, suitability of use and utilization, balance of priority of national, regional and sectoral land availability in the framework of implementation of spatial planning, (9) capable to design land use on land territory, coastal area, small islands, border and certain area by utilizing geographic information system, (10) capable to assess the implementation and issues of control and utilization of idle land and the management of state land and critical land, (11) capable to review the arrangement and implementation of land acquisition for public interest and generate conclusions from the results of the study and development, (12) capable to carry out land valuation activities, land value zone, zone of economic value of the region and assets of the region and its presentation by utilizing methodology, model analysis, application of technology technology of textual and spatial data processing based on recent science and technology, (13) capable to identify potential land consolidation objects and design a ground consolidation design by combining concepts, legal theories, surveys, administration, and social, (14) capable to review various problems, conflicts and land disputes and present the best choice of alternative solutions to the problem of disputes, conflicts and land issues to be used as a basis for decision making, and (15) capable to administer civil service, finance and state property in accordance with process and quality standards.

3.3. The subject of geography and land study program

It is important to show the subject which is learned in geography at and land study Study Program (S1), the Faculty of Geography, University of Muhammadiyah Surakarta, Central Java Province 2015; and in Diploma 4 (mapping concentration) at Land National Academy Yogyakarta.

Table 1 shows the subject of geography and Diploma 4. In geography there are 13 subjects in a column; from Survey and Mapping, Cartography, Remote Sensing, till regional planning. In Diploma 4 there are 16 relevant subjects referred to geography’s subject. The third column is credit of 16 relevant subjects. The total credit for 16 subjects is 39 credits. Otherwise, the Diploma 4 program has 149 credits for completing the program.
4. Discussion
For discussing, it divides in three parts. Firstly, we will discuss the learning outcomes. Secondly, we will discuss the subject proportion between two programs. Thirdly, we will discuss the result of land research in the terms of approach and the position of land administration.

4.1. Learning outcome
Refer to the learning outcome of Diploma 4 in 2014, the knowledge number one, three, and six are relating to geography. There are three (50 percent) learning outcome from six which are relevance to geography. It include the competence of mastering concept geospatial information, concept of earth science, and using information technology. The other relate to laws, administration, and social science.

Different from the knowledge learning outcome that relating currently, the general skills do not currently relate to the geography. Otherwise, those are very important competence. All that skills are needed for a candidate in the middle position management. Those are the skill for making right decision, managing complicated work, conducting leadership, developing his knowledge. Geographer is trained to face related aspects; human aspect and physical aspects. Managing the complexity is the point that geographer has similarity with land employee in term of these general skills.

In terms of special skill learning outcomes, the number that relate to geography is number one, six, seven, eight, nine, eleven, twelve, and thirteen. In other word there is eight skill (53 percent) related to geography. It shows how strong enough geography relates to land study.

4.2. Subject proportion
Table 1 shows subjects at S-1 graduate Geography Program versus Subject Diploma 4 Mapping Program. The total of relevant subject credit is 39 credit units. Completing program credit is 149 credit units. From 149 credit units, 29 credit units is not substantive subject, such as English, Bahasa Indonesia, Religion, Mathematics, Statistics, Research Methodology, and Ethic Profession. So, the total substantive subject is 149 minus 29, or 120 credit units. In another word, the proportion of Geography’s subject that is learned at Mapping Study Program in National Land Academy is 39 divide by 120, result 0,325; or in percentage 32.5%.
The rest subject, 81 unit credits (67.5%) consist of some disciplines such as Laws, Geodesy, Social Science, and Land Registration. So, Geography has a great proportion compare with others. However, some subjects are learned both by Geography and Geodesy program; such as Surveying and Mapping, Photogrammetry, Remote Sensing, and Geographic Information System. It is clear that there is no subject intersection between Geography and Laws, Geography and Land Registration. Otherwise there is a little bit intersection between Geography and Social Science which learned at at Mapping Study Program in National Land Academy; such as Land Politics, Sociology, Land Consolidation, and Society Empowerment.

4.3. Land research

Besides the big credits proportion that placing Geography is important for land study, the analyses of geography is also has important role. One of the famous one is spatial analyses. The questions have to developed in learning the phenomena on the earth are how the phenomena is learned, organized, grouped, came from, developed, interacted each other, and well organized ina system. This question is relevance to land study. There are many problems in land study, for being understood and making the best solution that need spatial analysis.

For an example is in land registration phenomena. There is a phenomenon that the people response for participating to land registration program is difference. Some region is more enthusiast than other. There are some factors that explain this phenomenon, involved human and physical factors; such as education, land value, people characteristic, land use, etc. The study like this factor will be comprehensively done in geography. Other phenomenon is the important of tools that are able to data process made spatial analyses quickly and up date.

Efforts to formulate agrarian science have been done in 2014 through STPN research by Sutaryono et al [4], and Pujiriyani DW et al [5]. The study of Sutaryono is an early study of agrarian science from an interdisciplinary review of the science philosophy of agrarian science. In conclusion, it is stated that (1) agrarian scope is not only land but also resources, (2) agrarian concept is not sector but is system, (3) existence of implication of inter and transdisipliner of science, agrarian education institute which not merely technical but holistic comprehensive, and policy as a system. In essence it is said that agrarian as a system.

Through various existing agrarian scientific publications, looks for the characteristics of the method or instrument used and how it is used in diagrammatic research, as well as its methodological development [5]. In conclusion it is stated that agrarian researchers use a variety of methods depending on the problem to be solved. Agrarian research is divided into three domains: academic research, policy research, and participatory research. Agrarian research is complete if combined with these three domains. Interdisciplinary research is recommended to be done so that the results of his research more widely and will answer agrarian problems appropriately. However, in the results of the study was not discussed about agrarian science more about the body of knowledge of land.

Land study is similar to land administration study. Land administration as the processes run by government using public -or private sector agencies related to land tenure, land value, land use, and land development [6]. The study of how people organize land. It includes the way to think about land, the institutions and agencies people build, and the processes of these institutions and agencies manage.

The composition of the study can be differentiated into physical-spatial studies (35%), Law and Administration (41%), and Social Politics (8%) [7].

5. Conclusion

Geography has strong role in land study. From the Land study learning outcomes, 50 percent knowledge learning outcome are relevance to geography, and 53 percent special skill learning outcomes related to geography. The proportion of credits that is learned, 32.5% credits at mapping Study Program in National Land Academy is Geography’s subject. In terms problem solving land problem, the employee often use spatial analyses to understand the problem and make solution comprehensively. Geography is
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