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The Improvement of Diploma I Cadastral Surveying and Mapping STPN as a Vocational College to Meet the Needs of Cadastral Surveyor Assistant in Indonesia

Kusmiarto and Nuraini Aisiyah

National Land College (STPN) Yogyakarta, Indonesia

Abstract

Diploma I Cadastral Surveying and Mapping (Diploma I PPK STPN) was established in 1996. It was originally established to meet the needs of Land Administration Project/Adjudication Program. After 21 years of establishment, Diploma I PPK STPN has produced 5234 alumni working for the Ministry of Agrarian and Spatial Planning/National Land Agency (BPN) and as Cadastral Surveyor Assistant. With the rollout of government issues to solve the 54 million parcels of land that have not been registered in the territory of Indonesia make the challenge for DI PPK STPN to be able to meet the need of human resource as a Cadastral Surveyor Assistant. To fulfil the need, Diploma I PPK STPN aims to establish a 6 (six)-month short training of cadastral surveyor assistant candidates. This article uses a comparative, descriptive and experimental method, which presents the data needed to achieve the goal. The needs include curriculum, teaching personnel, and supporting regulations. From these three aspects, it is necessary to formulate the short training design.

Keywords: curriculum, vocational college, cadastral surveyors assistant

Corresponding Author:
Kusmiarto
kusmiarto@stpn.ac.id

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1. Introduction

The Diploma I Cadastral Surveying and Mapping of National Land College (DI-PPK STPN) was established in October 23,1996 by the Decree of the Minister of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) Number 12/1996 and Letter of Permission Number 1924/D/T/1997 dated August 16, 1997 from the Director General of Higher Education, Ministry of Education and Culture, Republic of Indonesia. DI-PPK STPN is a vocational college. The background of the founding of the DI-PPK STPN was initially to meet the needs of the measurements on the PAP/adjudication activities in 1997. In the beginning, DI-PPK students came from surveying and mapping companies and also from individuals and communities. However, the DI-PPK students from

individuals/community kept growing, and the number of students from the surveying and mapping companies kept declining in this program. In 2016, after 21 years of its establishment, DI-PPK STPN has produced 5234 alumni with 2681 people (51%) working for the ministry of ATR/BPN and 2553 people (49%) working as Cadastral Surveyor Assistant (ASK) or in other sectors.

In the learning process, DI-PPK STPN uses the curriculum based on Cadastral. The curriculum were regularly adjusted with the development of surveying and mapping technology and user needs. Since the establishment of DI-PPK, the curriculum has been revised five times, in 2004, 2007, 2010, 2013 and 2016. The results of previous research conducted by [1], mentioned that DI-PPK STPN has implemented curriculum that teaches the 10 (ten) main surveying materials of the world. Field Practice held by DI-PPK STPN is set up as project-based, problem-based, and scaffolding learning. The integration of academia-practitioners has been automatically done in STPN as a College under the Ministry of ATR/BPN which provides Cadastral Surveyor Assistant for Ministry of ATR/BPN. As a vocational college, the structure of the curriculum shows a comparison of 63% practice and 37% theory. In addition, the lecturers of DI-PPK STPN come from a combination of academics background, practitioners, and professional organizations. Practitioners are usually former officials of the Ministry of ATR/BPN who then applying as a lecturer in D1-PPK STPN, whereas professional organization are the members/managers of the Indonesian Surveyor Association.

The rollout of government issues to solve the 54 (fifty four) million parcels of land that have not been registered in the territory of Indonesia poses a challenge for DI-PPK STPN to be able to meet the human resource needs of Surveying and Mapping Officers/Cadastral Surveyor Assistant for land measurement/Cadastral Surveying. By comparing the number of parcels that should be measured and mapped with the number of D1-PPK alumni (until 2016), it is assumed that the Ministry of Agrarian Affairs and Spatial Planning (ATR/BPN) will lack of human resources of cadaster surveyor to meet the goal.

The Regulation of the Minister of ATR/Head of BPN No. 33 of 2016 giving the opportunity to conduct a short 6 (six)-month education and training for Cadastral Surveyor Assistant (ASK) candidates without ignoring the curriculum requirement, teaching personnel and regulations that have been applied. However, the establishment of this short course should ensure that the graduates should fulfill the requirements as a Cadaster Surveyor. Therefore, it is necessary to formulate curriculum and qualifications of the program.

The formulation of the problem of this article is: (1) How to design the curriculum for education and short training of Cadastral Surveyor Assistant candidates? (2) What are the criteria of short educational and training teachers for ASK Candidates? (3) Are there any regulations that support the training?.

The purpose of this article is to draft the curriculum structure of short training for the ASK candidate along with the support of teaching staff and supporting reviews.

2. Literature Review

Based on (ATR/BPN 2016), The Licensed Cadastral Surveyor is the working partner of the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) which was appointed and dismissed by the Minister of ATR/BPN, consist of Cadastral Surveyors and Cadastral Surveyor Assistants. Cadastral Surveyor is a person who has the expertise and skill in conducting the process of survey and mapping of land parcels in the framework of land registration and has the absolute responsibility before the law for his or her surveying and mapping products. Meanwhile, The Cadastral Surveyor Assistant is a skilled person able to carry out the process of land parcels surveying and mapping for land registration under the supervision of a Cadastral Surveyor and is responsible for his or her surveying and mapping products. The Licensed Cadastral Surveyor may take the form of Individual Business Entity, or Business Entity Guild in the form of Firma. The Licensed Cadastral Surveyor Agency shall constitute Licensed Surveyor Service Office (KJSKB), consisting of Individual KJSKB and KJSKB Firma. Individual KJSKB is established by a Licensed Cadastral Surveyor who also acts as Leader, and consists of 1 (one) Cadastral Surveyor and at least 1 (one) Assistant Cadastral Surveyor. The KJSKB Firm shall be established by at least 2 (two) Cadastral Surveyors, with one of the allies acting as the Leader of the Partner, consisting of at least 2 (two) Cadastral Surveyors and at least 2 (two) the Cadastral Surveyors Assistant. The scope of KJSKB's works include planning survey and mapping, Organizing and conducting surveys and mapping; and documents storage and management resulting from the implementation of surveying and mapping work in the Protocol Book.

The Minister of ATR/BPN grants the license and appoints and dismisses the Cadastral Surveyor or Cadastral Surveyor Assistant. The licenses shall be granted with a validity period of 2 (two) years and may be extended for a further period of 5 (five) years periodically. Cadastral Surveyor or Cadastral Surveyor Assistant shall serve up to the age of 65 (sixty five) years and may be extended 2 (two) times up to the age of 70 (seventy) years according to the request concerned. Candidates of Cadastral Surveyor

and Cadastral Surveyor Assistant must pass the test held by The Ministry of ATR/BPN to be granted the license. The requirements for the examinations are: (a) Indonesian citizens; (b) Undergraduate education (S1) with the background of surveying and mapping, for Cadastral Surveyors; (c) Vocational high school, diploma one (D1) or Diploma three (D3) in surveying and mapping, for Cadastral Surveyor Assistant; (d) A former ministry ATR/BPN employee who has worked for 20 years (twenty) years and has expertise in Cadastral surveying and mapping, for Cadastral Surveyors; (e) Cadastral Surveyor Assistant who has worked for 10 (ten) years continuously and actively to be appointed as Cadastral Surveyor; (f) Has registered to become a member or has been a member of a professional association of surveyor in Indonesia. (g) Has attended and passed the education and training (Short Course) of Cadastral Surveyors conducted by Ministry of ATR/BPN, Institute, high school, polytechnic or professional association; (h) The election statement of the working area; and (i) Complete administrative requirements. Cadastral Surveyor and Cadastral Surveyor Assistant have a working area within 1 (one) province.

The Minister of ATR/BPN may organize a short 6 months education and training for candidate Cadastral Surveyor Assistant, to meet the needs of Cadastral Surveyor Assistant. The short education shall be held for 6 (six) months, and organized by The Office of Ministry of ATR/BPN, Education and Training Center; National Land Institute (STPN), and Regional Office of BPN throughout Indonesia. The requirements to follow this program are at least graduated from High School or Vocational High School.

Based on ('Regulation Of The President Of The Republic Of Indonesia Number 8 Year 2012 About National Qualification Framework Indonesia', 2012) The Indonesia National Qualification Framework KKNI is the framework of competency qualification gap which can pair, match and integrate between the field of education and the field of job training as well work experience in the framework of giving competence recognition work in accordance with the structure of work in various sectors. Qualification Level of KKNI consists of: (a) Levels 1 through 3 are grouped into operator positions; (b) Levels 4 to 6 are grouped in Technician or analyst positions; (c) Levels 7 to 9 are grouped into expert positions. Equalization of learning achievements generated through education with the qualification level in KKNI consist of: (a) Basic education graduate equivalent to level 1; (b) The lowest secondary education graduate equals the level 2; (c) Graduate Diploma 1 lowest equivalent to level 3; (d) Graduate Diploma 2 lowest equivalent to level 4; (e) Graduate Diploma 3 lowest equivalent to level 5; (f) Graduate Diploma 4 or Bachelor of Applied and Bachelor Degree lowest Equivalent to level 6; (g) Graduates of the Applied Masters are equivalent to level 8; (h) Applied Doctorate graduate and

Doctorate equivalent to level 9; (i) Graduates of professional education equivalent to level 7 or 8; (j) Specialist graduate education equivalent to level 8 or 9.

Based on these rules, Diploma I graduates are included in level 3 KKNI. The values according to the general description of level 3 KKNI can be described as follows: (a) Able to carry out a series of specific tasks, by translating information and using tools, based on a number of procedural options work, and able to demonstrate performance with quality and measurable quantity, which is partly the result of self-employment with indirect supervision; (b) Have a complete operational knowledge, general principles and concepts related to the specific field of expertise, so as to solve common problems with appropriate methods; (c) Able to work together and communicate within the scope of work. Responsible for the work itself and can be given responsibility for the quantity and quality of the work of others.

Based on [3] there are 10 (ten) areas of surveying covered by at least one-half of the 14 ABET accredited professional level surveying programs studied: (1) Plane surveying. (2) Photogrammetry and Remote Sensing. (3) Surveying Computation. (4) Geodesy/GPS. (5) Cartography/Mapping. (6) GIS/LIS. (7) Cadastral/Boundary Surveying. (8) Land Subdivision. (9) Surveying Practice/Camp. (10) Professional Issues.

3. Methodology

This article uses a comparable descriptive and experimental method, which presents the data needed to achieve the goal by juxtaposing the need to realize a short course of training program. This method is expected able to answer the three proposed problems and able to generate the design of curriculum structure of short course ASK candidates along with the support of human resources (teachers) and supporting reviews of regulations.

4. Result and Discussion

To answer the formulation of the first problem, the following curriculum structure is presented in DI-PPK in Table 1 as follow:

The aforementioned curriculum structure accommodates the user needs (Ministry of ATR/BPN and Licensed Cadastral Surveyor Service Office) and develops the technology of measurement and mapping. Based on the structure of the aforementioned curriculum, the researcher calculated the percentage of theories and practices as 37% theories and 63% practices.

Table 1: The curriculum structure of DI PPK.

SEMESTER I					
No.	Courses	Code	SKS		
			Theory	Practice	Total
1	Religion Education		2	0	2
	a. Islam	PPK11011			
	b. Kristen	PPK11012			
	c. Catholic	PPK11013			
	d. Hindu	PPK11014			
	e. Buddhist	PPK11015			
2	Pancasila and Civic Education	PPK1102	2	0	2
3	Applied Mathematics	PPK1201	1	2	3
4	Cartography	PPK1202	1	1	2
5	Land Surveying	PPK1203	1	2	3
6	Computer Data Processing	PPK1204	1	2	3
7	Photogrammetry	PPK1205	1	2	3
8	Surveying Instrument Practice	PPK1206	0	2	2
9	Land Law	PPK1301	1	1	2
Total (1)			10	12	22
SEMESTER II					
No.	Courses	Code	SKS		
			Theory	Practice	Total
1	Professional Ethics	PPK2103	1	1	2
2	Land Registry	PPK2401	1	2	3
3	Digital Mapping	PPK2207	1	2	3
4	Ground Control Mapping	PPK2208	1	2	3
5	Cadastral Surveying	PPK2209	1	2	3
6	Measurement Documents	PPK2210	1	2	3
7	Cadastral Surveying and Mapping Practice	PPK2211	0	4	4
Total (2)			6	15	21
Grand Total (1) + (2)			16	27	43
Source: (STPN 2016).					

Furthermore, the researcher tried to compare with the curriculum structure of Vocational School of Geomatics (SMK Geomatics) as shown in Table 2.

Based on that comparison, the researcher then presented the draft structure of the curriculum for 6 months acceleration program of Cadastral Surveyor Assistant Candidate as follows:

The structure of the curriculum for aforementioned accelerated program curriculum is not calculated in credit semester units (SKS), but in hours. This is based on the

Table 2: Curriculum structure SMK of 2013. Field of expertise: Technology and engineering, Program expertise: Geomatics.

Subject		Class					
		X		XI		XII	
		1	2	1	2	1	2
Group A (Required)							
1	Religion Education and Character	3	3	3	3	3	3
2	Education of Pancasila and Citizenship	2	2	2	2	2	2
3	Bahasa Indonesia	4	4	4	4	4	4
4	Math	4	4	4	4	4	4
5	History of Indonesia	2	2	2	2	2	2
6	English	2	2	2	2	2	2
Group B (Required)							
7	Cultural Art	2	2	2	2	2	2
8	Workshops and Entrepreneurship	2	2	2	2	2	2
9	Physical Education, Sports & Health	3	3	3	3	3	3
Group C (Vocational)							
C1. Basic of Expertise							
10	Physics	2	2	2	2	–	–
11	Chemistry	2	2	2	2	–	–
12	Technical Pictures	2	2	2	2	–	–
C2. Basic Skills Program							
13	Introduction to Surveying and Mapping	8	8	–	–	–	–
14	Fundamentals of Surveying and Mapping Calculation	10	10	–	–	–	–
C3. Expertise Package							
15	Surveying	–	–	18	18	24	24
	Remote Sensing	–	–	18	18	24	24
	Geographic Information System	–	–	18	18	24	24
Total		48	48	48	48	48	48

Source: https://www.smkn2muaraenim.sch.id/kurikulum-smkn-2-muara-enim

provisions outlined in Government Regulation number 128 of 2016 on Non-tax State Revenue (PNBP) applicable in the ministry of ATR/BPN.

Table 3: Proposed draft structure of curriculum for accelerated program for cadastral surveyor assistant candidate.

No.	Subject	Total (Hours)	Theory (Hours)	Practice (Hours)
1	Land Surveying	52	16	36
2	Land Registry	16	16	0
3	Professional Practice and Ethics	12	12	0
4	Computer Data Processing	42	12	30
5	Ground Control for Mapping	66	24	42
6	Measurement Documents	66	24	42
7	Cadastral Surveying	66	24	42
8	Field Work (4 Months x 22 Days x 8 Hours)	704	0	704
Total		1024	128	896

Source: Data Analysis

Based on Diploma Supplement as a complement explaining learning outcomes and achievements completed by the holder (DI PPK's alumni), the learning outcome in knowledge domains consists of (1) understanding the methods of cadastral surveying and mapping, (2) Understanding administrative and legal aspects of land affairs and (3) understanding communication skill. The third aspect is a field of science that must be mastered by the teachers in this ASK short course of training.

5. Conclusions

By comparing the curriculum of DI-PPK STPN and Curriculum of SMK Geomatics and taking into account the curriculum standards used in the education of surveyors in the world, the draft curriculum structure for short education and training programs of ASK candidates can be drawn up. The program's lecturer criteria include 3 (three) aspects, namely cadastral surveying and mapping, administrative and legal aspects of land affairs and communication skills. Some regulations have also supported this accelerated program.

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