Impediments in e-Planning in Local Government - Indonesian Case Study

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Key words: spatial planning, coastal urban environment, disaster risk reduction

SUMMARY

Spatial planning is one of the most complex government activities since it involves multi-stakeholders and directly influence the way community interact with land. Main deliverables of spatial planning is regulations and maps of planning zones. They need be delivered to community effectively and transparently. Traditional method of providing this service is by using printed material which sometime impractical, immobile, difficult to maintain and limiting public access. Internet offers improvement of this process by enabling electronic delivery of planning regulations and maps, and facilitating online transaction. The implementation of e-Planning depend on several factors, among them are human resources, funding, and ICT infrastructures.

This paper describes findings on what challenges and impediments faced by local government in Indonesia if they want to implement e-Planning concepts. It was base on the findings from questionnaires distributed to local planning agencies and websites survey. Three broad aspect were investigated, organization, ICT infrastructures and spatial data infrastructures. Websites survey was conducted to investigate how local government and local planning agencies make use of their websites.

There are some impediments in implementing e-Planning in Indonesian local government. They include staff qualification, limitedly available funding, ICT infrastructures, and institutional arrangement. To overcome this situation, a gradual steps approach is proposed, which includes technical and non-technical matters.

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1. INTRODUCTION

Spatial planning is becoming more and more important with the increasing number of population, but not the available land. This process needs to be conducted in more efficient way, transparent, and be able to be accessed with greater time flexibility. Traditional way of delivering planning regulations and maps, and interacting with community need to be adjusted with recent development in electronic technology, specifically the internet. E-Planning is part of e-government initiative which uses internet as a tool to deliver spatial planning regulations and maps to community as well as enabling online permit consultation, application, and complaints.

E-Planning has been implemented in a number of places, such as United Kingdom, Australia, and the Netherlands. All these countries are listed in the top 10 in e-Government Readiness Index published by the United Nation Public Administration Network based on their survey in 2008 (UN-PAN, 2008). United Kingdom is at number 10, Australia at number 8, and Netherlands at number 5. Their applications are located at the local level, states or municipalities. On the other hand, the position of Indonesia is at number 106 in e-Government Readiness Index. It is interesting to know what challenges faced by Indonesian local government if they want to implement –Planning concept.

This paper was based on response received from 34 respondents from a questionnaire distributed in June-July 2009. The respondents are from local government level, which is defined as district (kabupaten) or city (kota). The questionnaire investigates some characteristics in local planning agencies, in term of human resources, spatial planning formulation, and spatial data infrastructures. As a result, this paper focuses on what type of impediments faced by local planning agencies. It analyses current situations and relates them with required or ideal conditions. The paper describes findings from survey, elaborate the strength and weaknesses, and provide recommendation in the end.

2. SPATIAL PLANNING

This section will describe matters related to spatial planning in Indonesian context. It start from laws and regulations that govern spatial planning, followed by spatial data in spatial planning.

2.1 Law and Regulation

Legal foundations are needed in spatial planning, mostly law that has land or space aspects. The following laws are to be consulted in spatial planning formulation:

a. Basic Agrarian Law (5/1960)
b. Industrial Law (5/1984)
c. Conservation of Living Natural Resources and Ecosystem Law (5/1990)
d. Tourism Law (9/1990)
e. Housing and Residential Area Law (4/1992)
f. Environment Law (23/1997)
g. Local Government Law (32/2004)
h. Financial Balance between Central and Local Government Law (33/2004)
i. Road Law (38/2004)
j. Disaster Risk Reduction Law (24/2007)
k. Spatial Planning Law (26/2007)
l. Management of Coastal Zones and Small Islands (27/2007)

Beside Laws, at present, there are seven Government Regulations that directed spatial planning formulation, as follow:

a. National Spatial Planning (26/2008)
b. Land Use Planning (16/2004)
c. Map Accuracy Standard for Spatial Planning (10/1992)
d. Presidential Decree on Conservation Zone (32/1990)
e. Presidential Decree on Land Utilization for Industrial Zone (33/1990)
f. Minister of Housing and Infrastructure Regulation on Six Guidelines for Spatial Planning
g. Minister of Home Affair Regulation on

With the introduction of new Spatial Planning Law, some technical guidelines need to be revised to reflect changes and new directives. Currently, three government regulations are being prepared and discussed among stakeholders. The latter two were not present previously as a government regulation, instead as ministerial directive that has less power and lower position.

a. Government Regulation on Map Accuracy Standard for Spatial Planning
b. Government Regulation on Spatial Planning Formulation
c. Government Regulation on Public Participation in Spatial Planning

In all of the laws and regulations listed above, there is no explicit reference to e-Planning. The use of internet/website was mentioned only twice, in the draft version of Government Regulation on Spatial Planning Formulation and Government Regulation on Public Participation in Spatial Planning. In both documents, the use of internet refers to dissemination of spatial planning information.

2.2 Spatial Data in Spatial Planning

Various type of spatial data required in spatial planning. Law on Spatial Planning list general specification for different level spatial planning, ranging from national level, provincial level, district level and special zone. According to Government Regulation 10/1992, the following specification applied:

Table. 1. Specification of spatial planning map

Level	Scale	Remark
National	1 : 1,000,000	
Provincial	1 : 250,000 or 1:100,000 or 1:50,000	depends on the coverage of the province
District (Kabupaten)	1: 100,000 or 1:50,000 or 1:25,000	depends on the coverage of the district
City (Kota)	1:50,000 or 1:25,000 or 1:10,000	depend on the coverage of the city

Spatial planning map should contain the following eight main features: coastline (if applicable), hydrographic features, residential area, transportation network (road, railway, airport and seaport), administrative boundary, contour line, spot height, place name. There are some thematic maps to be produced in the district/city spatial planning, which should contain minimally the following themes: conservation zone, development zone, residential area, transportation network, electricity and energy, telecommunication network, infrastructure for drinking water, utility network. Spatial data required for spatial planning and developing these thematic maps produced by, mostly, government agencies., as listed in Table 2.

Table 2. Producer of fundamental spatial data required in spatial planning

Map	Producer	Use of internet for dissemination
Topographic	National Coordination Agency for Surveys & Mapping	Yes, 1:1000,000
Land use	National Land Agency	No
Conservation Zone	Department of Forestry / Planning Agency	No
Geological	Geological Agency	No
Transportation network	Department of Public Work / Planning Agency	Yes
Administrative boundary	National Coordination Agency for Surveys & Mapping / Planning Agency / Bureau of Statistics	Yes
Residential area	Department of Public Work / Planning Agency	No
Hydrographic features	National Coordination Agency for Surveys & Mapping / Planning Agency	Yes, small scale
Hazard map	Geological Agency	No

3. e-PLANNING

e-Planning is a part of e-government initiative (Environment Agency, 2010) which refers to the process of delivering planning service electronically using internet. It aimed to improve the traditional spatial planning process and deliveries to community and stakeholders. The ultimate goal is achieve better value of services, as shown in Figure 1. A number of services can be delivered online, such as planning permit application, consultation, planning documents and regulations, and provision of interactive map to visualize planning zones. Its implementation requires high-level vision, supporting policy, careful preparation, adequate in-house technical expertise and funding support.

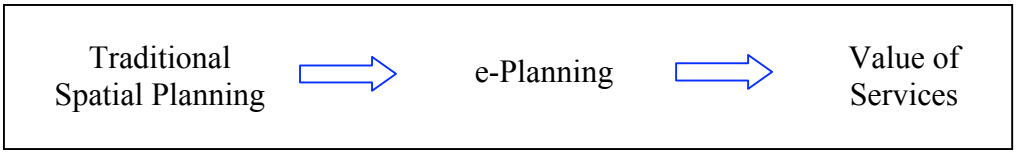


Figure 1. e-Planning to increase value of services.

e-Planning has been implemented in a number of places, such as in United Kingdom, United States of America, Australia, and the Netherlands. In United Kingdom, all dealings with public conducted by planning authorities should be conducted electronically by the end of 2005 (Kingston, 2005). In Australia, State of Victoria launched some e-Planning application in 2007. It includes planning permit activity report, planning application form, planning maps online, and planning property report (DSE, 2009). Since the, the system is continuously upgraded. In the Netherlands, the online portal of spatial planning (R0-online) has been published and operational since June 2008. It covers the entire country, at all level of government (Georgiadou & Stoter, 2010).

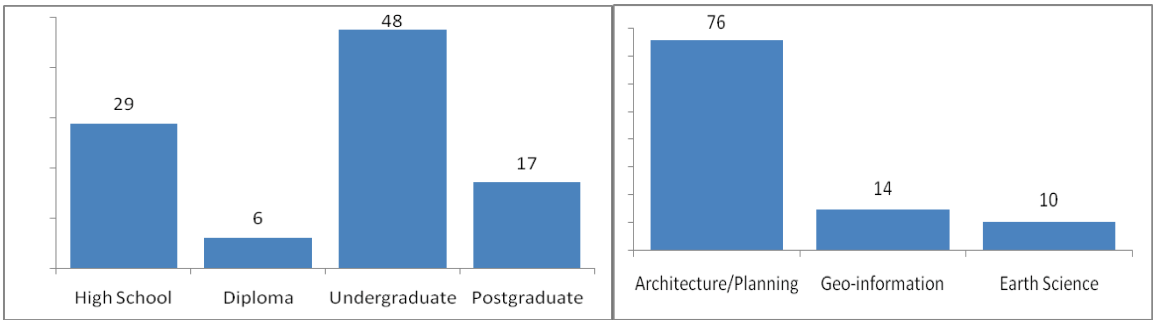
4. IMPEDIMENTS

In Indonesian case study, there are some differences. Firstly, the e-Government Readiness Index for Indonesia is still far below. Secondly, the number of local government is almost 500 distributed in area stretched approximately 5,000 km east-west and 2,000 km north-south. This huge geographic coverage and population of 230 million posses difficult challenges in unifying e-government policy. Each local government has different strength and weakness, with high differences among them.

There some challenges in transforming the currently operated spatial planning into e-Planning systems, which can be classified into human resources, funding and policy. Human resources in many planning agencies seems to lack of expertise to design, operate and manage ICT required for e-Planning. Fifty percent of respondents acknowledge this problems. Funding and policy are two other closely related impediments. Lack of funding can be attributed into financial capacity of each district/city or policy in distributing appropriate allocation for each development sector. Elaboration of these challenges is given in the folowing sections.

4.1 Human resources

Human resources is the heart of every organization. They are the ones who planning, actuating, managing, controlling every aspect of organization activities. Therefore, having qualified and competent staff is important component in planning organization. Figure 2 portray academic qualification and background of the respondents.



a. Academic qualification b. Acedmic background

Figure 2. Percentage pf academic qualification (a) and background (b).

In the section of academic qualification, 1,323 staffs were listed by all respondents. The lowest qualification is high school, which account for 29%. Their tasks usually requiring low level technical expertise, such as administrative matter or field officer. Diploma qualification is on based on three years vocational program. Staffs with this qualification usually assigned to tasks with strong requirement on technical matters. Innovation and policy prepared, proposed and decided by staffs who have undergraduate or postgraduate qualification. Based on the figure 2.a, it appears that majority of the staff have required qualification in adopting new concept, develop innovation and implement changes on the way spatial planning delivered.

Three engineering disciplines of architecture/planning, geo-informatics and earth science. This does not mean to ignore other discipline contributing to e-planning development. These three disciplines are related to the use of spatial data in spatial planning and disaster risk reduction. Geo-informatics covers disciplines of Geodesy, Surveying, Geography, and remote sensing. While earth sciences covers the disciplines of geology, geophysics and physical geography. Architecture/planning were classified into one category because before the emergence of planning as a separate study program in Indonesian universities, it was part of architecture. As shown in figure 2.b., of these three disciplines, 76% of the staff has background in architecture/planning. This number is understandable since they are the planner who deal with it since the very beginning. With regard to the extensive use of spatial data and challenges to overcome disaster risks, the involvement of staff with background in geo-informatics and earth sciences is necessary. Of the total staff in these three disciplines, 14% of the staff having background in geo-information science and 12 % in earth science.

This figure portray the overall proportion obtained from the survey and does not consider the distribution in each district. A closer look at each district reveal that many local planning

agency does not have staff with educational background in geo-informatics or earth science. Among 26 districts responded to the question, 14 of them do not have staff with background in geo-informatics and 13 of them do not have staff with background in earth sciences. Although educational background does not necessarily the only factor affecting the succesful adoption of e-planning, but it contributes to its smooth implementation.

4.2 Use of GIS

GIS has a lot of functionalities in spatial planning, including creates maps, conducting spatial analysis and assisting simulation on development scenarios. It was found that most of the districts/cities have used GIS for quite some time. Four types of GIS have been used by local Planning Agencies, in which all of them use desktop GIS, server-based GIS (11%), mobile and internet GIS were used by 7% of the respondents. Only a small number of them started to use GIS in 1999 or early 2000, although most of them after 2005. GIS first introduced as subjects in the university, at the department of Geodesy or Faculty of Geography, in the end of 1980s or early 1990s. Therefore, students who graduated in mid 1990s already have competence in GIS. Some of them may work at the planning agencies, and after few years may have influence on the technical policies. However, there is a surprising finding that 26% of the respondents did not use GIS as supporting tool. It is not clear how they develop spatial planning without support from GIS or how GIS was not considered to be of necessary tool in spatial planning formulation. It is highly likely that spatial planning project was contracted out to consulting company and the planning agency was in position as supervisor and receive the result.

Other findings reveal that only 30% of the district planning agencies has their own GIS unit. This condition can be attributed to the following possibilities: (1) lack of funding, (2) lack of visionary program and awareness of the importance of GIS, (3) lack of pressure and directive from provincial/central government, (4) lack of skilled staff able to operate GIS or (5) condition of ICT infrastructures. Funding is important issue, especially after the decentralization policy been implemented. Two situations may exist, firstly there is a condition that funding was really not available to develop GIS unit, and secondly GIS development was not consider to be of high priority and therefore receive little or no funding. Another possibility is that almost all spatial planning projects were outsourced to third party. The planning agencies task was to supervise, with other government agencies, the work of consulting company. In relation to the limited number of planning agency operate separate GIS unit, it can be concluded that Fortunately, 61% of the respondents feel that they received good or very good support from the mayor of the disctrict/city.

4.3 ICT Infrastructures

ICT infrastructure is a vital part of in delivering e-Planning. It comprises of hardware, software and policy for capturing, producing, managing, and delivering planning fatabase to customers. In this research, respondents were asked to provide assessment on the current condition of thier ICT infrastrcture. Based on the responses from questionnaires, it was found that half of the respondents consider their ICT infrastructures were poor or very poor. Only

24% of them consider they have good or very good infrastructures, and 26% think they have an adequate one. At present, many planning agencies have limited ICT infrastructures and internet connection. Internet is the backbone in e-Planning, required for the following functionalities:

a. coordinate and collaborate with other government agencies
b. disseminating planning documents and maps to customers
c. enabling platform for online transaction
d. receiving input from public.

Of the respondents, 42% stated that their organization has their own website or have control over a certain webpages. Those who do not have website may have webpages in their district/city website. Unfortunately, information on spatial planning are limited, in both documents and maps. According to Sutanta (2008), 88% of the 442 districts/cities surveyed in 2008 have official websites. Majority of them did not provide or display any types of maps in their official websites, with only 42% did. Most of the maps were in .jpg or .png format, which means that they were meant for provide general thematic information. In terms of file size, most of them have small size which affect their clarity and readability.

The use of internet for spatial planning maps dissemination were also very limited. The survey found only 29 districts/cities providing spatial planning maps online. Three different format were used to display them: .jpg, .pdf and internet GIS. One of the most complete spatial planning map was provided by a district in Central Java, by make their map book downloadable in PDF format. The majority still using .jpg file format as a way to disseminate it. Internet GIS has been used in many central government and private sectors for several years. However, it seems that their adoption in local govermnet was still in the very beginning stage. It was found that only 29 districts/cities (7%) have developed internet GIS application as part of their official websites. Other use of internet was to gather public input. Web forum and guest book were the most common method for doing this. Some local government websites have staffs who stay online to answer enquiries from public on any matters, not specifically related to spatial planning.

Internet used by 16% of the respondents to disseminate spatial planning regulation and maps. Most of the planning agency (62%) made available the spatial plan regulation and map in their office. Anyone needs to read it has to visit the office. They can directly get access to the regulation and map. However, there is still 22% of the planning office that requires visitor to make request prior to get access to the spatial planning map and regulation.

4.4 Institutional Arrangement

All planning agencies need spatial data from other government institutions, which indicate interdependency among government agencies in using spatial data. However, there are 6% of the respondents that did not make their spatial data available to other government agencies. Most of them inform other agencies on the availability of their spatial data. However, existing practice observed in the field indicate that they do not use a formal mechanism in informing

other agencies. They usually inform other government agencies in a meeting, not through a periodic formal letters or publication or websites. The term metadata might be relatively new for some planning agencies although a working definition has been given in the questionnaires. It was found that 56% of the planning agencies have created, a possibly simple, spatial metadata.

Inter-agency cooperation is unavoidable , and therefore all government agencies have to cooperate with others to achieved their objectives. Finding of the survey indicate that formal cooperation is limited, as indicated by the finding that only 9% of the them has MOU with other agencies. Almost all of them working within a 'gentlement agreements' framework on data sharing and exchange. This framework requires good personal relation among staff in different government agencies. Its sustainability can not be guaranted since formal procedure was absent.
On the aspect of government regulation, the finding is very surprising. There are only 17% of the planning agencies aware of the central government regulation on spatial data infrastructures. The central government has issued a presidential decree on National Spatial Data Infrastructures two years before, Perpres 85/2007. The aim of the question is to find out whether officials in local government level aware of this decree. The finding shows that more works have to be done to make them aware and ready to implement it.

Accessing and working with spatial data coming from various government agencies posses some challenges and difficulties. Two types of difficulties were assessed, technical and non-technical. The finding shows that technical difficulties were more frequently encountered by local planning agencies than non-technical one. It can be inferred that technical expertise in local planning agencies need to be upgrade. To list a few, it is includes: data specification, projection system, differences in spatial data format, accuracy, no staff able to use them, and data out of date. Non-technical difficulties includes: different procedures to obtain data exist among different agencies, difficult to access data from central government agencies (BPN and Statistics), no coordination and difficult to find the person in charge of the data.

5. CONCLUSION AND RECOMMENDATION

This paper describes some main impediments faced by Indonesian local government if they want to transform the traditional spatial planning into e-Planning. It consists of policy, human resources, funding, current use of GIS, and institutional arrangement. These impediments are inter-related and coming from internal planning organization or local government. If the 'business as usual' approach is kept, then the transformation process into e-Planning still needs some years to start.

This paper proposes a gradual step in this transformation process. In the technical part, the first step is provision of national and local planning regulations on the planning agency website, which many already did. The next step is displaying or provision of static planning zones map, and then upgrades it into interactive map. The fourth step is developing an online transaction tool to enable community to submit application online, pay fees, etc. In the non-technical aspect, continuous upgrading on staff qualification needs to be conducted.

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BIOGRAPHICAL NOTES

Heri Sutanta obtained his B.Eng. from Gadjah Mada University and MSc from ITC. He joined the Department of Geodesy and Geomatics Engineering as lecturer in 2002. He was involved in teaching on the subjects of GIS and Applied GIS from 2002 to 2007. In 2006, he was a Local Course Coordinator for a Refresher Course on Land Administration for the South and South East Asian Region, jointly conducted by ITC, Netherlands Kadaster, and GMU. Heri commenced his PhD study in mid 2008 with the research topic on Spatial Planning Support System and SDI Platform for Disaster Risk reduction.

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Ian D Bishop obtained his BSc (hons), MSc and PhD from the University of Melbourne. He is currently a Professor in the Department of Geomatics, University of Melbourne. Before that he was an Associate Professor in the College of Architecture, Texas A&M University. Even earlier he was a lecturer in the School of Environmental Planning at Melbourne. He has also been employed at various times by Universiti Pertanian Malaysia, the CSIRO Division of Land and Water Reources, the Victorian Department of Planning and Environment and, most recently, the Institut für Netzwerk Stadt und Landschaft , Swiss Federal Institute of Technology (ETH) Zürich. He has also undertaken consultancies for government and private industry in GIS specification and application, visualisation and visual analysis. He was a partner in the establishment of the University of Melbourne Collaboratory for Architectural and Environmental Visualisation (CAEV).

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