Developing Local Government Capacity for SDI Development in Indonesia

Mulyanto DARMAWAN, Heri SUTANTA and Adi RUSMANTO, Indonesia

Key words: local government, capacity, SDI development, law and regulation

SUMMARY

Indonesia has just enacted the Law on Geospatial Information no 4/2011. This law is aimed to foster the development of geospatial data and information as well as their utilization throughout the whole government institutions. In the aspect of spatial data infrastructure, prior to the enactment of this law, there is the presidential Decree 85/2007 on the National Spatial Data Network. Amongst government regulations, these two regulations serve the needs of central and local government. Their implementation is facilitated, managed and directed by Badan Informasi Geospatial – BIG (the Indonesian Geospatial Information Agency). With regard to the numerous geospatial data that have been produced nationally, the current effort is directed toward more effective and efficient data sharing among key stakeholders in the framework of national spatial data infrastructure (NSDI).

Developing an NSDI for a vast archipelagic country with more than 500 districts/cities and 34 provinces possesses a unique challenges. The geographical location of Indonesia that spans more than 5,000 km east to west, 1,500 km north to south, and spread over ten thousand of islands is the first big challenge. It creates difficulty and high cost for developing a reliable internet connection, not to mention about the production of large scale map covering the whole region. The second challenge is the availability of trained and skilled staff at the local government level. The third is on the different level of political will of each local government as a result of regional autonomy. The form and size of local government agencies mandated to manage spatial data are varied, from none to sufficient. Funding difficulty is also important factor hindering the creation of local SDI.

To respon to these challenges, BIG developed several strategies, including: providing technical assisstance, develop a national geoportal based on proprietary and open source software, conducting focus group discussion and training, as well as engaging local universities as strategic partners. This paper is part of the research on NSDI development to acknowledge SDI leverage in the local regional capacity development, identify issues and challenges, and presents the current initiatives.

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1. INTRODUCTION

Indonesia has just enacted the Law on Geospatial Information no 4/2011. This law is aimed to foster the development of geospatial data and information as well as their utilization throughout the whole government institutions. In the aspect of spatial data infrastructure, prior to the enactment of this law, there is the presidential Decree 85/2007 on the National Spatial Data Network. Amongst government regulations, these two regulations serve the needs of central and local government. Their implementation is facilitated, managed and directed by Badan Informasi Geospatial – BIG (the Indonesian Geospatial Information Agency). With regard to the numerous geospatial data that have been produced nationally, the current effort is directed toward more effective and efficient data sharing among key stakeholders in the framework of national spatial data infrastructure (NSDI).

Developing an NSDI for a vast archipelagic country with more than 500 districts/cities and 34 provinces possesses a unique challenges. The geographical location of Indonesia that spans more than 5,000 km east to west, 1,500 km north to south creates difficulty and high cost for developing a reliable internet connection, not to mention about the production of large scale map covering the whole region. The second challenge is the availability of trained and skilled staff at the local government level. The third is on the different level of political will of each local government as a result of regional autonomy. The form and size of local government agencies mandated to manage spatial data are varied, from none to sufficient. Funding difficulty is also important factor hindering the creation of local SDI (Sutanta et al, 2010).

To respon to these challenges, BIG developed several strategies, including: providing technical assisstance, develop a national geoportal based on proprietary and open source software, conducting focus group discussion and training, as well as engaging local universities as strategic partners. This paper is part of the research on NSDI development to acknowledge SDI leverage in the local regional capacity development, describes efforts, identify issues and challenges, and presents the findings. Some facts presented here were resulted from previous survey in 2009 and 2013 as well as discussions and field visit to local government agencies.

2. LOCAL GOVERNMENT SETTING

Indonesia is an archipelagic country, spanning approximately 5,000 east to west and almost 1,500 km north to south. It has the largest number of islands in the world, 13,466 islands. The total land area is more than 1,9 million square kilometer, while the sea water covering almost 6,3 million square kilometer.

Indonesia is a republic with 34 provinces and 508 districts/cities. The central government lies

in Jakarta. The provinces are spread out in six major islands and smaller islands. District/city is the second level sub-national government headed by mayor. There is a trend that the number of province and district/city will grow as new province and districts/cities were to established as a splitted up region from their parent province or district/city. Although this process is mainly political, but nonetheless it also affecting SDI development in various ways.

3. ISSUES AND STATUS OF SDI AT LOCAL GOVERNMENT

3.1 Policy and Regulation

Policy and regulation provide umbrella as well as legal foundation for developing SDI. The first national regulation on SDI in Indonesia is the Presidential Decree no. 85/2007 on Spatial Data Network. It provides directive to Bakosurtanal on how to develop SDI and coordinating its effort with other central government agencies. However, this regulation is not enough anymore to response to advancement in technology and changes in institutional setting. Therefore, it is currently being revised, the timing is also coincide with the enactment of the Law 4/2011 on Geospatial Information. This law is a milestone in geospatial-related activities in Indonnesia. It provides clearer definition, directive, regulation, guidance and mandate geospatial development. Badan Informasi Geospatial (the National Agency for Geospatial Information) was then established as a new name of Badan Koordinasi Survei dan Pemetaan Nasional (the National Coordinating Agency for Survey and Mapping). The law provides stronger legal support for the national mapping agency to execute its mandate. Geospatial information creation and dissemination was accelerated ever since. SDI development at national level takes new shape and speed.

Local governments are in need of the law, and immediately benefited by the law, especially since approximately 80% of local government policies are spatially referefenced (O'Looney, 2000). They are now become more knowledgeable on who is doing what in geospatial information provision. However, considering the different government structures, local government regulation is required to implement SDI policy at local level. Funding allocation needs legal reference, which in local government case requires local government regulation as well.

There are two types of local government regulations: regional regulation (peraturan daerah) and governor or mayor regulation. The first usually requires lengthty process as it needs approval from local legislative body. Therefore, type two regulation is most commonly found for its easier issuance. Based on a survey in 2013, there are only two provinces out of 14 respondents and one district out of 34 who already issued governor or mayor regulation. Most local government do not have local legal reference and some are in the process of issuing relevant regulation. Despite this situation, five provinces and two district/city have written mechanism for accessing geospatial information which applicable to other government agencies or public.

3.2 Human Resources

Good staffing with good qualification will ensure that organization's program can be executed well. Generally, central government agencies do not have problems in quantity and qualification of staff. However, the situation in local government is different from the central government. They lack of staff qualified and funding for recruiting additional staff.

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In terms of quantity, local government facing limited number of staff available for manning GIS or SDI unit. The 2013 survey found that two provinces and four districts/cities do not have staff for the management of geospatial infomation. Further, the number of provinces and district/city who have staff with ability to operate geospatial server is less. This reflect that difficulties in establishing having qualified staff for SDI development is prominent.

Availability of qualified staff with necessary skill obtained through education or training urgently need to be increased. In addition, a proper management of staff promotion need to be established to ensure that there will be adequate pool of staff to replace previous staff being promoted.

3.3 Institutional Setting and Funding

GIS has been used in Indonesia since mid 1980s through various project on land and marine resources evaluation and planning (Reed, 1995; Rais, 1997; Dahuri et al, 1999; Atmadilaga & Sarbini, 2010). The first users were mainly central government agencies and regional development planning agencies involved in the projects. Local government, which mainly provincial government, obtained hardware, software, knowledge and skills. Some of them able to retain these resources, others were not.

Many local governments, especially at the district/city level, started the use of GIS at the end of 1990s or even mid 2000s at the latest. Proper institutional arrangement are still evolving, with local governments exploring best practices to be adopted. At present, only 43% provincial respondents and 21% district/city respondents have GIS section. Others do not have or GIS tasks were executed by staff who were not part of any particular section.

The existence of GIS section is closely related to funding. Routine funding for geospatial system provision were only available in 36% of provinces and 7% of district/city. Others were relied on non-routine funding or central government funding. This figure is similar for the case of geospatial data provision. Local government seemed to not have enough internal funding, due to budget limitation or budget prioritization.

3.4 Geospatial Data and Technology

Geospatial data utilization is the prime reason for the development of SDI, to make better use of it through data sharing and service provision. Therefore, the availability of geospatial data need to be ascertain. Based on the survey in 2013, only three provinces do not have complete coverage of topographic map at the scale of 1:25,000 or 1:50,000. On the spatial planning map, two provinces have not finished revising their spatial planning map.

At the district/city level the situation is as good as provincial level. Only 12% of the district/city who do not have complete coverage of topographic map. All district/city have spatial planning map. However, utility map only owned by 21% respondents. Similar situation exists for parcel map which only owned by three districts/cities. The management of parcel map still in the hand of local office of the National Land Agency.

From this figure, it can be concluded that at the provincial level, fundamental spatial data have been prepared well by local government but the thematic maps still need to be further developed. The provision of topographic maps for all local government will be accelerated by BIG in the next few years, as mandated by law.

Creation and management of geospatial information requires geospatial software. It was

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found that 57% provincial respondents have the necessary GIS software, while the rest still rely on graphic software. At the district/city level, the number is slightly rose to 59%. The possesion of software, staff and IT infrastructures affect the development of geoportal. Only 50% of provincial respondents have geoportal and only 18% in district/city level. Those who own geoportal are the one who received assisstance from BIG.

4. DEVELOPING CAPACITY OF LOCAL GOVERNMENT

4.1 National Coordination Meeting

National coordination meeting (Rakornas) was held annually since 1991 (Lilywati and Gularso, 2000) under the name of Rakornas Sistem Informasi Geografis Nasional (SIGNas) or National Geographic Information System. In 1999/2000 the name of the meeting was changed to Rakornas Infrastruktur Data Spasial Nasional (National Spatial Data Infrastructure) to reflect changes in policy and focus. It was changed again in 2011 to Rakornas Infrastruktur Informasi Geospasial (Geospatial Information Infrastructure) to harmonize with Law on Geospatial Information.

The participants of the national coordination meeting more or less the same, although the name has been changed several times. They include participants from central government agencies, local government planning agency, university and industry. The event is used to disseminate new policy, deliberation of future strategy and reach concensus for future activities. Best practices from participants were shared to be modified and adopted by others.

4.2 Technical Assisstance

In general, local government has limited able staffs to design, operate, maintain and develop local SDI. Some local governments who has bright (usually young) staffs seemed to have advantages, as they eager to implement new ideas and have passion to make it happen. This is the finding of severeal focus group discussions and field visit. Without technical assisstance, they were able to self-learn and develop local SDI.

For others, BIG offers technical assisstance by sending their staff to help local government developing their SDI. BIG also published a guide book on how to develop local SDI. The book was written by BIG staff and researchers from Centre for SDI Development (PPIDS: Pusat Pengembangan Infrastruktur Data Spasial). It was aimed as a self-learning book on self assessment on their current capabilities, needs analysis, organizational development, road map creation, and regulatory principles.

4.3 Funding and Policy Development

Funding is one of the biggest obstacles faced by local government, as explained in section 4.3. BIG has no authority to provide in cash funding for local government. To assiss them with hardware and software, BIG has made a grant program for some local governments. The grant consists of a complete server to be used for developing geoportal. However, only limited number of local governments and central government agencies receive the grants. Nonetheless, this stimulus program enabled local governments to quickly create geoportals.

On the aspect of policy development, BIG assissts and encourages the issuance of local government regulation as an umbrella for local SDI. Communication among government

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agencies located far apart may be limited. In this case, BIG also bridging the communication and provide samples of regulation already issued by other local government as a reference. Further, BIG staffs also act as resource person with their knowledge on relevant laws and regulations.

Policy development is also related to the knowledge and viewpoint of governor or mayor on the importance of geospatial information to support development activities. At the lower level, head of regional development planning agency, are already aware of it. Therefore, raising awareness of the local government's head has also been conducted.

4.4 Establishing PPIDS

Indonesia is vast archipelagic state with so many provinces and districts/cities. It will be a huge job for BIG to visit the whole provinces and districts/cities. The total number of BIG staff is less than 700, but only small number tasked to help local government. To overcome the situation, BIG approaches and encourage local universities with relevant geospatial information expertise to take part in the ectivities. BIG encourages facilitate universities to establish Centre for SDI Development (Pusat Pengembangan Infrastruktur Data Spasial: PPIDS) to act as a regional centre for innovation and consultation for neighbouring local governments. The following universities are now formally have PPIDS established (from west to east):
1. University Syiah Kuala, in Aceh
2. State University of Padang, West Sumatra
3. Institute of Technology, Bandung, West Java
4. University Gadjah Mada, Yogyakarta
5. Sepuluh November Institute of Technology, East Java
6. Tanjungpura University, West Kalimantan
7. Mulawarman University, East Kalimantan
8. Lambung Mangkurat University, South Kalimantan

Two universities are currently in the process of establishing PPIDS, Diponegoro University in Central Java and Hasanuddin University in South Sulawesi. After completion of the PPIDS establishment in these universities, ten provinces will have ten PPIDS. The establishment of PPIDS in all provinces facing difficulties as not universities in all provinces have study program related to geoinformation. Activities of PPIDS include:
1. Assissting local government on user needs assessment, policy development, specify technical specification, and human resources development through meeting and Focus Group Discussion.
2. Consultation on technical aspect, dataset creation and management, and website development.
3. Training for staff for basic and new technology required for SDI deployment.
4. Research on all aspects of SDI required for better implementation and development.

5. CONCLUSION AND FUTURE WORKS

Indonesia has pursuing the development of SDI since two decades ago, while the foundation of digital map creation was even started around three decades ago. There were issues and challenges affecting the fruition of the efforts, ranging from political situation, vastness of the

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country to funding availability. In recent years, the difficulties have been addressed one by one. With the introduction of regional autonomy at district/city level, the focus is now being directed toward developing local SDI.

Developing local SDI faces different challenges than that of national SDI. Various strategies and activities have been devised to accelerate the development of local SDI. They attempt to address all pillars of SDI, and strengthening local government capacity in order to make them able to build on their capacity in the future. One of the unique initiative is the development of regional centre of expertise in SDI at local universities (PPIDS) to address the vastness of Indonesian land area and the number of local governments to be assissted. While there are still some issues to be overcomed, the development of local government capacity to build, operate, maintenance, and improve local SDI seemed to be improved.

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BIOGRAPHICAL NOTES

Mulyanto Darmawan obtained his engineer degree from Agriculture faculty of Gadjah Mada University, MSc from Tsukuba University and PhD from the University of Tokyo. He joined to the National Cordinating Agency for Surveys and Mapping in 1991. Soon after the tsunami in the Indian Ocean in 2004 he has been tasked to lead the Geospatial Task Force for reconstruction and rehabilitation process in Tsunami affected Area in Aceh. In 2008 he returned to Bakosurtanal and work for Atlas and Global mapping. He was worked for the Presidential Unit for Monitoring and Accelerating Development Process (UKP4) during 2009-2010. He was a member of team behind the enacment of Indonesian Geospatial Information Law. He is now Head of Standardization and Implementation of Geospatial Information unit, the National Geospatial Information Agency (BIG)

Heri Sutanta obtained his B.Eng. from University Gadjah Mada, MSc from ITC and PhD from the University of Melbourne. He joined the Department of Geodetic Engineering as lecturer in 2002. He teaches GIS, Applied GIS, and Spatial Data Infrastructure. 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 with ITC and the Netherlands Kadaster. He is currently Director of the Research Centre for SDI Development (PPIDS) of the University Gadjah Mada and also the Deputy Head of the Postgraduate program in Geomatics.

Adi Rusmanto obtained his B.Sc. from Faculty of Geography and his M.Eng. from the City and Regional Planning Program, Faculty of Engineering, both from University Gadjah Mada. He has extensive experiences and hold numerous posts in BIG. Prior to his current position, he was Head of the Centre for Land Resources Surveys and Head of Marine Resources Surveys. He is currently the Head of the Centre for Standardization and Institutional Aspects of Geospatial Information, BIG.

CONTACTS

Dr. Mulyanto Darmawan
Bidang Standarisasi dan Kelembagaan
Badan Informasi Geospasial
Indonesia
Email: mulyanto.darmawan@big.go.id
Web site: http://www.big.go.id

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