

## **Legal aspects of enriching authoritative geospatial information using participatory mapping data**

**Harry FERDIANSYAH and Franko JHONER, Germany & Indonesia**

**Key words:** Legal aspect; participatory mapping; Geospatial Information Act

### **SUMMARY**

This paper is investigating the legal standing for Participatory Mapping related-aspect towards enriching authoritative geospatial information under the implementation of Geospatial Information Act of Indonesia. The research shows that there is a gap between government vision on providing a legal base to enable participatory mapping and the implementation perceived by participatory mapping actors. Several additional works needed to be done to establish a strong base for effective collaboration regarding authoritative spatial data enrichment. The research is vital as a remark for ongoing collaboration in Indonesia and provides a reference for a similar condition that may exist.

# Legal aspects of enriching authoritative geospatial information using participatory mapping data

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## 1. INTRODUCTION

The enactment of *Undang-undang Informasi Geospasial* (UUIG – The Act of Geospatial Information<sup>1</sup>, “the Act”) on 2011 establishes fundamental change by giving a strong base to guarantee the availability of a complete, up-to-date and reliable geospatial information (Republik Indonesia, 2011). Alongside with another form of data, the geospatial information provided by the authoritative bodies (National Mapping Agency and the other Governmental Organization (GO) that produce spatial information) support Indonesian government strategic planning in development.

The Act itself endorses the intensive use of geospatial information in governance as well as for the citizen or another party that relies on the spatial data of Indonesia. It also recommends the use of single reference on the production of base and thematic geospatial information in Indonesia. The implementation of the Act itself shown in the “One Map” Policy that launched in the same year, it aims to improve access to reliable geospatial data and integrate geospatial information among government ministries and agencies. The policy itself emerged from the unfortunate fact that spatial data produced by many of Indonesian GOs were unsynchronized. The One Map Policy operate based on four principles: consistency, accessibility, transparency and participatory (Nirarta, 2013). Regarding the participatory principle, the policy reserves a space for participatory mapping (PM) initiated by the citizen as a part of the participatory one map initiative that includes utilization, correction mechanism, and dissemination of geospatial data in Indonesia.

Furthermore, the policy indicated in Presidential Decree (*Perpres*) number 27/2014 regarding *Jaringan Informasi Geospasial Nasional* (JIGN - National Geospatial Information Network). On the practical implementation, *Badan Informasi Geospasial* (BIG – Geospatial Information Authority) as the National Mapping Agency (NMA) introduces *Peraturan Kepala* (Perka - Regulation of the Head of National Mapping Agency) number 1/2015 that highlight the mechanism for participation in the National Geospatial Information Network. The regulation itself acts as the representation of national spatial data infrastructure of Indonesia operated by National Mapping Agency (NMA) as the sole authoritative national agency for geospatial data.

On the participant view, the enactment of the Act and its derivatives bring several responses. Ranging from sceptic to positive, one viewed as a normative that will not differ much with the previous situation, another believes it is the proper solution to the uncertainty of geospatial information arrangement in Indonesia. Nevertheless, up to date the enactment at least has

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<sup>1</sup> Unofficial English translation available at the United Nation Committee of Experts on Global Geospatial Information Management website via this link: <http://bit.do/UUIG> (last accessed 27 September 2017)

changed several aspects regarding geospatial-related substances. First and foremost was the establishment of *Badan Informasi Geospasial* (BIG) as the new NMA, BIG own broader legitimation and role concerning geospatial data compared to *Bakosurtanal* as the former institution on mapping in Indonesia that only act as coordinator for GO. Second, the Act indicates to provide a channel for the involvement of external parties that have a concern with spatial information in Indonesia. Whereas on the former policy only mentioned GOs as the contributor to geospatial information and NMA position as the clearinghouse on the *Infrastruktur Data Spasial Nasional* (IDSN - National Spatial Data Infrastructure of Indonesia).

This paper emphasizing the legal aspect of the potential of authoritative spatial data (ASD) enrichment by participatory mapping data, particularly on the data sourced from Participatory Mapping Organization (PMO) after the enactment of the Act.

## **2. RELATED WORKS**

There is diverse research topic regarding legal aspect of the spatial data that produced by other parties than the government. The legal concern on Volunteered Geographic Information (VGI) shown in the overview of the legal considerations from the perspectives of the host, contributor, and user (Scassa, 2013), or the liability on VGI integration with authoritative data in Canada (Rak, Coleman, & Nichols, 2012). Regarding the enactment of the Act also well investigated in the frame of law and communication (Simorangkir & Samosir, 2011). The legal aspect of participatory mapping data included in the research of its potential (Chambers, 1994; Lei & Hilton, 2013). The institution complexity of collaboration between government and related parties also researched well (Harvey, 2010) including the inter-organization relationship between the parties involved (Ferdiansyah, 2015). Numerous research on the technical subject is also widely available, such as the enrichment of authoritative data (Shakeri, Alimohammadi, & Alesheikh, 2013) or facilitation (Sheppard, Wiggins, & Terveen, 2014).

Nevertheless, from the many resources of participatory mapping, the legal framework of enriching authorized spatial data by utilization of participatory mapping data is scarce. Especially with the strong influence of national law that has been experienced by Indonesia since 2011.

Since the implementation of One Map policy not fully realized, the exploration of the legal base between NMA and PMO to collaborate in enriching authorized spatial data of Indonesia become open for investigation. Local PMO selected among the other contributors under some considerations. First, the number of PMO data in Indonesia is significant for collaboration. Second, the unique history and characteristic of PMO of Indonesia. Last but not least, the PMO existence in Indonesia is relatively stable and reliable research data source compared to loosely individual contributors.

## **3. METHODS**

To achieve the purpose, several steps taken to ensure the strong base for investigation and analysis regarding the legal aspect. The initial step to get understanding regarding the issue was to study the existing documents, including the former historical governmental document before the legislation and enactment of the Act. Several data from an external source also introduced as well as the interviews to related parties on participatory mapping in Indonesia. Combining all the data, it expected to give a comprehensive view on a legal aspect of the development and activities of the participatory mapping.

### 3.1 Document Review

Several documents related to the participatory mapping that included for this research are as listed below.

Table 1. List of research documents

Documents	Origin	Remarks
UUIG/ the Act number 4/2011	NMA	The law governs all the geospatial-related subject in Indonesia.
SOP on Participatory Mapping	PMO	Legal/technical document on PM activities published by PMO. It is adopted widely by number of PMOs in Indonesia
<i>Perpres</i> 27/2014	President of Indonesia	Legal document on the geospatial information network of Indonesia
<i>Perpres</i> 94/2011	President of Indonesia	The establishment of Badan Informasi Geospasial
Perka 1/2015	NMA	Mechanism of participation in the national geospatial information network
SOP on Participatory Mapping	NMA	Draft (on-going) Standard Operating Procedure of PM activity
<i>Perpres</i> 85/2007	President of Indonesia	National Spatial Data Network
Perka 10/2012	NMA	Secretariat of National Spatial Data Network
SK BIG 21/2011	NMA	Working group on National Spatial Data Network

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**Note:**

SOP : Standard Operational Procedure

Perpres : Presidential decree

Perka : Regulation of the Head of NMA

SK : Surat Keputusan, decree of the Head of NMA

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As the primary document reviewed for this research purpose, below is the list of the articles which contains general regulation on every aspect of geospatial activities and products. At least 21 from 79 articles of the Act directly connected to the PM-related activity.

Table 2. Articles of the Act

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Article nr. (#)	Topic		Remarks
20	Thematic Information production	Geospatial (T-GI)	Forbid changing accuracy and produce T-GI larger than reference
22	Base established only by government	GI (B-GI) only by	Type of B-GI: Coastal line, Hypsography, Waters, Land Cover, Toponyms, Boundary lines, Transportation & Utilities, Building & public facilities
23	TGI establishment		<i>Each person can produce T-GI</i>
27	Geospatial data collection	data (GD)	GD standards and collection method
28	Permit on geospatial data collection		Criteria GD collection that requires permit from government
32	Geospatial data processing		GD processing location, resources, and permission
36	GI presentation		Must refer to data source and objective of GI utilization
44	Endorsement		Appreciation for those who promote contribution on spatial data
45	Geospatial establishment	network	Network for GI dissemination provided by government
46	Legal consequences of GI		Competent authority approval of GI

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<b>49</b>	GI quality	Mandate to state quality of GI produced
<b>50</b>	Derivative product of GI	permission from GI owner for commercial purposes
<b>52</b>	TGI for disaster management	Mandatory TGI submission in case of disaster
<b>54</b>	Performer of GI	Each person can establish GI
<b>55</b>	Qualification of GI performer	Referring to #54
<b>57</b>	Capacity building activities	For producer and user of TGI
<b>59</b>	BGI modification and dissemination	Prohibition to publish altered BGI
<b>60</b>	TGI modification and dissemination	Prohibition to publish altered TGI
<b>61</b>	GI presentation and accuracy	GI presentation must correspond with the data accuracy
<b>62</b>	GI dissemination	Referring to #46
<b>63</b>	Administrative penalties	Referring to #20, 36, 46, 49, 50, and 55
<b>67</b>	Punishment for violation of GI	Referring to #61

### 3.2 Interview

Certain interviews carried out to get further and detailed information regarding a legal aspect of the PM activities. The respondents of the interview divided into three groups: PMO, GO and Academics as shown in the table below.

Table 3. Respondent groups

Respondent	Remarks
<b>Government [5]</b>	<u>National Mapping Agency of Indonesia</u>  Subdivisions of: Standardization for Geospatial Information Establishment, Disaster and Climate Change, Large-Scale Topographic Mapping, Legal Affairs  <u>Local Government</u>  District of Indramayu, West Java
<b>PMO [13]</b>  <b>(Organization Name)</b>	JKPP, AMAN-SS, YRBI, SLPP-Jambi, SLPP-Kalsel, LSDP SD INPERS, MITRA BENTALA, PADI Indonesia, SLPP-Kalteng, SandiFlorata, PPK, SLPP-SumBar, Navigasi.net.
<b>Academics [6]</b>	Geodesy & Geoinformatics of <i>Institut Teknologi Bandung</i> : 2  Geodetic Engineering of <i>Universitas Gadjah Mada</i> : 1  Faculty of Geography <i>Universitas Pendidikan Indonesia</i> : 2  <i>Universitas Paramadina</i> : 1

PMO as the main actor on the participatory mapping holds important role and interest on the establishment of legal basis in the PM activities and data since many of non-governmental organizations extensively mapping many areas and owning a significant amount of PM data. The certainty of the legal basis for their activity become more concerned, as in the Act itself introduced penalty/punishment for any person that produce geospatial information that leads to certain casualty. Furthermore, the vision of legal basis for PMO also came into the conversation, as PMOs still experiencing uncertainty in the legal subject, even after the enactment of the Act.

Government itself here mostly represented by BIG as the NMA of Indonesia. Additionally, one interview with local government that has a success story in PM collaboration also included. The Act explicitly stated as the main institution to govern every geospatial-related matter that takes place/exists in Indonesia region, based in this facts NMA interviewed in the details by interviewed four specific subdivisions that have the most role and contact with PM activity.

Academics supposed as the balancer and considered the neutral source for the research data. Since the enrichment of ASD itself mainly involves two parties (PMO & GO) that could have biased in the opinion and produce a statement that tends to benefit or protect the certain interest.

The academics who interviewed were chosen based on their expertise, experience, and interest in the PM subject.

PMO and NMA interviewed twice, the major initial interview conducted in 2014 and the second held on year after the first to see the development and change on the overall topic of PM and ASD enrichment. Further, in the 2017 additional minor interview and data collection were taken with NMA on the purpose gathering the most recent development on the legal aspect subject.

The major interview itself consist several other interlinked topics alongside the legal aspect, such as Inter-Organizational Relationship, Enrichment scheme for ASD and Application layer to facilitate the ASD enrichment. The detail of major interview themes that related to the legal aspect is as listed below:

Table 4. Interview questions

<b>Theme</b>	<b>Number questions</b>	<b>of Respondents</b>
<b>Identity</b>	7	GO, PMO
<b>Membership</b>	9	GO, PMO
<b>Activities</b>	5	GO, PMO
<b>Organization Positioning</b>	19	Academics, GO, PMO
<b>Spatial Data</b>	35	Academics, GO, PMO
<b>Legal Aspects &amp; spatial information</b>	9	Academics, GO, PMO
<b>Total</b>	84	

## 4. FINDING AND DISCUSSION

### 4.1 PMO's Legal Aspect

The research on the document and interview yield several interesting facts and vision regarding legal aspect for the enrichment of authoritative spatial data. Most of the interviewed PMO aware about the importance of legal aspect concerning their existence and activities. It disclosed in the number of PMO that possesses the certificate on the organization establishment, only one-third of interviewed PMOs that operate as a non-registered organization. In the term of organization mission, most of the PMO stated its goal, only one out of 13 respondents that do not officially declare any objective of the organization. Number of PMOs showed decent and orderly firm organization, most of them accordingly managed and documented its members and activities. More than half of the interviewed PMOs assured that the organization applies certain

norm for its member (e.g., member dismissal and cancellation), organization hierarchy on the chain of command, as well as perform periodic succession on its organizational structure.

Furthermore, more than half of the interviewed PMO actively practice advocating communities that require assistance on geospatial-related subjects, such as maintain their indigenous area or performed a civil action on land ownership dispute. Regarding the financial source, although nearly all PMOs allow accepting donation to run the organization, all strongly stressed that the financial help only passed to the organization after evaluation under strict terms and conditions (e.g., no political agenda, propaganda, intimidation, etc.)

#### **4.2 Legal Aspect of Spatial Data**

On the matter of spatial data legal aspects, most of PMOs have a deep concern on the PM data legalities and valuation. These affect the way of PMOs data collection and extends to the term and condition of PM data sharing and utilization (including government). For example, certain PMO only willing to share and let its data utilized (for enriching ASD) if NMA gives PMO equally full access to the ASD data. On the other hand, PMOs have been recognizing the rigidity of term and consequences of using ASD long before the enactment of the Act. This experience leads PMOs proposing for a clear formalization of accessibility on ASD for PM activity. Furthermore, to realize collaboration in enriching ASD, PMO request a facilitation infrastructure by the government of Indonesia alongside the formal document that reflects the mutual partnership between government and PMOs.

#### **4.3 PMO's View on Spatial-related Policy**

Surprisingly, despite most PMO certain of the legal aspect of their organization, data, and activities, the number of PMOs that aware of the effect on the Act enactment are low. Fewer than one-third of the PMO respondents acknowledged the Act would affect PMOs activities, the majority of PMO are unaware of the Act consequences, while the rest of PMO perceived that the Act would not make any effect at all on their activities. There are three main points stated by PMOs Regarding the outcome of the Act to PM-related activities in Indonesia. First, the Act should create a firm base for PM activities, whereas in the former era before the enactment NMA only functioned as a government institution. Second, the Act should encourage standardization on PM activities; it opens the possibilities for entities other than a governmental institution to participate in spatial data integration. More than half of respondents recommend the government to provide specific and detailed regulation over PM activities in Indonesia. In the last point, PMOs perceived that certain clauses of the Act tend to hamper and reduce the PM activities, as in the penalty and punishment clauses.

PMOs also pointed out the more specific opinion regarding the effect of PM data adoption by the government. First, PMO recognized the enriched Authoritative Spatial Data (eASD) that produced using NMA and PM data could have weak legal position compared to the “real” ASD.

Second, adoption of PM data could add the complexity of spatial data access and structure, as the collaboration will integrate external data source other than governments. Third, the PMO-NMA data integration could create conflict between the parties. It is possible that NMA and PMO have a different interpretation of a certain feature. Fourth, PMOs believed that the collaboration could encourage and build intensive cooperation and understanding between government (especially on the local level) and PMO, and lead to improve spatial data produced by both parties. Fifth, the data integration obviously will enrich the content of ASD, whereas the current NMA data tend to ignore the locality of the spatial information, such as the indigenous area or the improper toponym data. Finally, PMO believed the collaboration could upgrade the value PM data by standardization and improve policy produced by the government.

#### 4.4 Legal Aspect of Enriching Authoritative Spatial Data

Majority from all three groups of respondents (GO, PMO and academics) agree that technically and legally the enrichment of ASD (using PMO data) is possible. In the context of legal aspect, the “legally possible” infers to the certain prerequisite of the document to enable the data integration between the parties to happen. Certain PMO stated that a minimum document to support and enable the data integration could realize in the form of Memorandum of Understanding (MoU) between PMO and NMA that simply states the collaboration between two parties. A MoU can also have additional item as a support for the collaboration in the form of SOP on PM, training on data acquisition and processing, facilitation tools, and data sharing management. The easier choice is the government using a top-down approach, promulgating any required policy to support the subject. However, the top-down approach tends to run in one-way communication and might overlook the aspiration that comes from the PMO as the concerned entities.

The term of “ASD enrichment” generally understood and believed by all respondent groups one of many ways to enhance ASD using an external source. The foreseen benefits of eASD by all the respondents summarized in the table below:

Table 5. enriched ASD benefits

<b>Benefit of eASD</b>	<b>Remarks</b>
Accelerating ASD production	According to NMA, currently, occur the imbalance between resource and target to map entire Indonesia. NMA need an additional resource to accelerate map production. Adopting PM data is one of the alternatives to pacing up with the target.
Rich in Attribute	eASD could be richer in the attribute. PMO claimed that many of non-spatial (e.g., audio and video documentation on toponymy) data can add the validity of the mapped object.
Locally Accurate	PM data in Indonesia mostly sourced from the local community. Certain PMO demonstrated the example of an error in river flow and toponym from ASD.

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Turn PM data into “legal” document	PM data formerly considered as an informal/unknown data source, until Government recognized “Ancestral domain map” in 2012. However, the implementation still far from the finish.
Recognition of locality & community information	ASD map production based on the annual project within limited time windows. Data acquisition on object attributes (area, name, river flow, etc.) usually sourced from the local government, it tends to neglect the local information.

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Concerning legal aspect on the eASD, NMA expressed several additional points to consider. First, NMA pointed out that the enrichment of ASD is likely possible only to certain data/feature, such as toponym, administration boundary, transportation, and hydrology. Another theme such as human-made feature, land cover, and hypsography, NMA preference is mainly on the primary data sources (satellite image, radar, aerial photo, etc.) Second, to enable PM data adopted into eASD, NMA must have the right to do a cross-check and validation over submitted data. The verification would act as a filter for any possible major error that produced and to ensure the overall quality meet the standard for PM data. Last, NMA stated that any eASD that later being fully adopted by the government would be an ASD data. In another word, eASD (produced using PM data & ASD) that has fully pass a cross-check and validation the status will be “upgraded” to ASD data. Consequently, any error and mistake, as well as the right to the data, will be fully become NMA concern or any respective government institution that adopted eASD. The status will be slightly different with any eASD that not fully adopted by the government, it suggested for both parties (NMA/GO and PMO) to share the burden, especially to fix the data in case of any error, mistake or dispute exist.

#### 4.5 Academic’s views on the eASD Legal Aspect

The interview revealed unique information regarding the status of eASD. The majority of respondents positioned eASD in the middle between unofficial spatial data and ASD. The in-between position of eASD indicated that the status of eASD is possible being ASD when it adopted by certain GO or discarded it entirely as a new data production emerge or found inappropriate after the evaluation. There also exists another status of eASD as “temporary official.” The “temporary official” attributed to the eASD in the certain extraordinary condition, such as disaster, disease epidemic, and war.

The consequences of legal charges for certain misconduct on the spatial data stated in the Act led all the respondent groups to position eASD cautiously. The majority agreed that eASD is entitled and potential to legal charge. No distinction should remain despite the eASD produced collaboratively between PMO and GO or in the case of eASD status as “temporal” data (e.g., in an emergency such as disaster). However, as not all the respondents agree that eASD is subject to a legal charge, few of them stated that only ASD is relevant for a legal charge. Still, there are respondents from PMO fully opposing the Act to apply any legal charge to all kind of spatial data misconduct (either on PM data or ASD).

## 5. RECOMMENDATION

BIG as the representative of Indonesian government should intensify dissemination on the legal aspect of Participatory Mapping or any related activities data acquisition, production, and distribution of spatial data that conducted by any entity other than Government Organization. It includes the mechanism of the collaboration between these parties and NMA. The numbers of PMO still do not aware the consequence of the Act enactment indicated that BIG had not reached those participatory mapping entities properly. Even after the government publish numbers of regulation on each level (national to internal government orderly), without proper dissemination the effectiveness of the Act is rather dull.

Additionally, BIG as Indonesian NMA must reevaluate and reconsider its former function as the coordinating agency, since nowadays this function has not been optimized in the context to synchronize existing and upcoming regulations, especially the one that related to the Participatory Mapping. The former role must fully transform into the act that actively maintains the establishment of geospatial information in Indonesia. Moreover, the new NMA role should ensure the involvement of all entities that have a concern in the mapping of Indonesia in this context, including, but not limited to PMO.

The legal charges, penalties, and consequences to the spatial data utilization misconducts have to be applied carefully. Minor opposition to this point shows that certain party is not ready on the subject. Again, the appropriate way to approach entities -other than governmental agencies- seems become a vital point to convey the message that it tends to prevent the loss rather than to punish or intimidate. The recommendation that emerges from the respondents were to take pertinent steps to minimize the possible legal charge on the eASD. The main endorsement is to provide policy support for the eASD, quality control, and quality assessment document for the data (including manual/SOP for PM-related activity), concise and clear on the data disclaimer, and build comprehensive eASD metadata. In the case of legal charge occurred, the majority the respondents suggested that both parties (GO and PMO) must take responsibility, although certain respondents recommend returning the responsibilities either to PMO or NMA, depend on the source that led to the loss.

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## **BIOGRAPHICAL NOTES**

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