One Map Policy of Indonesia: Status, Challenges, and Prospects

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SUMMARY

The One Map Policy of Indonesia (OMP) is the program to integrate and synchronized the thematic maps of Indonesia to have one georeference, one standard, one database, and one geoportal. This program is regulated by the Indonesian Presidential Regulation no. 9/2016 regarding the acceleration of the implementation of One Map Policy on 1:50.000 scale map accuracy, issued on 4 February 2016. The program handles 85 thematic maps of 19 ministries and agencies and covers 34 provinces in Indonesia.

The program consists of four main stages, namely compilation, integration, synchronization, and data sharing. At the compilation stage, 85 thematic maps that have been produced by ministries and agencies were compiled and verified. The validated thematic maps are then integrated with the standard base map. Integrated thematic maps sometimes still contain several problems, such as overlapping land use permits and inconsistencies with existing spatial plans. All these problems are resolved at the synchronization stage. Since this stage is usually quite complicated and takes time to resolve, the process of sharing the OMP products is carried out after the integration stage is completed. Data sharing is done using a geoportal managed by the Indonesian Geospatial Information Agency, especially for participating ministries and agencies, as well as all provincial and local governments.

The integrated and synchronized thematic maps of OMP should be used by the central and local governments as a reference, among others, for improving the quality of spatial planning and land use, resolving land-use conflicts, natural resources management, the realization of sustainable development goals, and disaster risk reduction management.

The status of OMP will be presented in this paper, especially the achievements related to integration, synchronization, and data sharing activities. Problems and challenges encountered during the program execution are also discussed. The prospects for further strengthening of OMP is also discussed.

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One Map Policy of Indonesia: Status, Challenges, and Future Plan

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1. INTRODUCTION

Indonesia has a vast land and maritime territory (about 5000 km by 2000 km), many islands (more than 17.500 islands), and abundant land and marine resources. Geospatial data and information are very much needed to develop and manage this vast territory and its natural resources in an effective, efficient, and sustainable manner. It should also be integrated with other non-spatial data and information, to make it more beneficial.

In Indonesia, according to the Law no. 4/2011 on Geospatial Information and the Law no. 11/2020 on Job Creation, the geospatial information is categorized into basic and thematic geospatial information, as shown in Figure 1. The basic geospatial information includes the information from geodetic control networks and base maps.
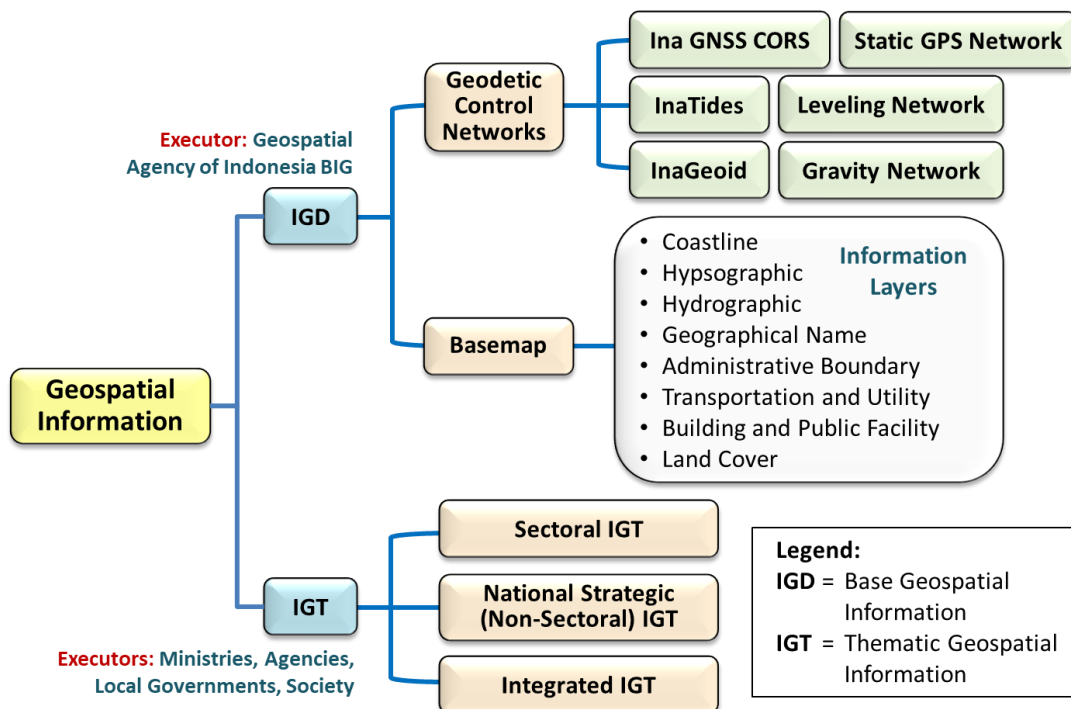

Figure 1. Geospatial data and information in Indonesia.

Geodetic control networks of Indonesia consisted of static GPS geodetic control points (7209 benchmarks up to the end of 2019), Static Leveling Network (5785 benchmarks up to the end of 2019), GNSS CORS stations (237 stations up to the end of 2019), Continuous Tide Gauge

Stations (159 stations up to the end of 2019), Main Gravity Control Networks (50 benchmarks up to the end of 2018), and the Indonesian geoid with the present accuracy of about 10 to 15 cm. More detail information on those geodetic control networks can be seen in (*SRGI,* 2021).

Currently, the base map of Indonesia is named the Rupa Bumi Indonesia (RBI) map, which is a three-dimensional digital map with 8 layers of information, namely coastline, hypsographic, hydrographic, geographical name, administrative boundary, transportation, and utility, building and public facility, and land cover. Base maps of Indonesia are covering land and sea areas, including the coastal area. The scales of these base maps are 1:1000 (specific area according to needs), 1:5000, 1:25.000, 1:50.000, 1:250.000, and 1:1.000.000. At present, the complete land coverage of Indonesian base map is at 1:50.000 scale, which part of it is derived from the base map of 1:25.000 scale. The Indonesian Geospatial Information Agency (BIG) is currently accelerating the establishment of a 1: 5000 scale base maps for land areas outside forest areas, and a 1: 1000 scale base map for certain target areas, such as metropolitan cities and certain economic development areas.

Thematic maps in Indonesia have many themes and are usually based on an appropriate base map. Sources of thematic maps in Indonesia are ministries and agencies, local governments (provinces, districts, cities, and villages), private parties, non-governmental organizations (NGOs), and society at large. Due to the various sources of thematic maps, it is possible that these maps have unexpected characteristics, such as not using the same base map, unequal mapping standards, non-uniform quality, one theme that can be produced by several parties, and the existence of each thematic map is not always known to the public.

Based on the Regulation of the Minister of National Development Planning/Head of the National Development Planning Agency of the Republic of Indonesia no. 5/2018 concerning procedures for preparing government work plans, it was stated that the national development paradigm is THIS (Thematic, Holistic, Integrative, Spatial). Based on this paradigm, all national development planning must be based on accurate and accountable geospatial data and information, in addition to other non-spatial data such as statistical data.

In fact, all the other stages of the development process, i.e., implementation, monitoring, evaluation, and controlling will require geospatial data and information in various forms, as illustrated in Figure 2. In this case, data and information from geodetic control networks, base maps, and thematic maps will all be useful with their respective roles and functions.

For thematic maps, because they can be made by various ministries, agencies, and other non-governmental parties, it is necessary to pay attention that all these thematic maps must be integrated and synchronized through One Map Policy program, before being used to support programs and programs related to national development activities. In addition, to make it more useful to support the national development process, geospatial data and information, including from the One Map Policy product, should be integrated with non-spatial data and information (such as statistics, population, finance, and other sectoral data), through One Data Indonesia program. One Data Indonesia (ODI) is a government data management policy that aims to create quality data, easily accessible, and can be shared between central agencies and local governments. This policy is contained in the Presidential Regulation no. 39 of 2019 concerning One Data Indonesia. More detailed information about this program and its products, can be seen at (*ODI*, 2021).

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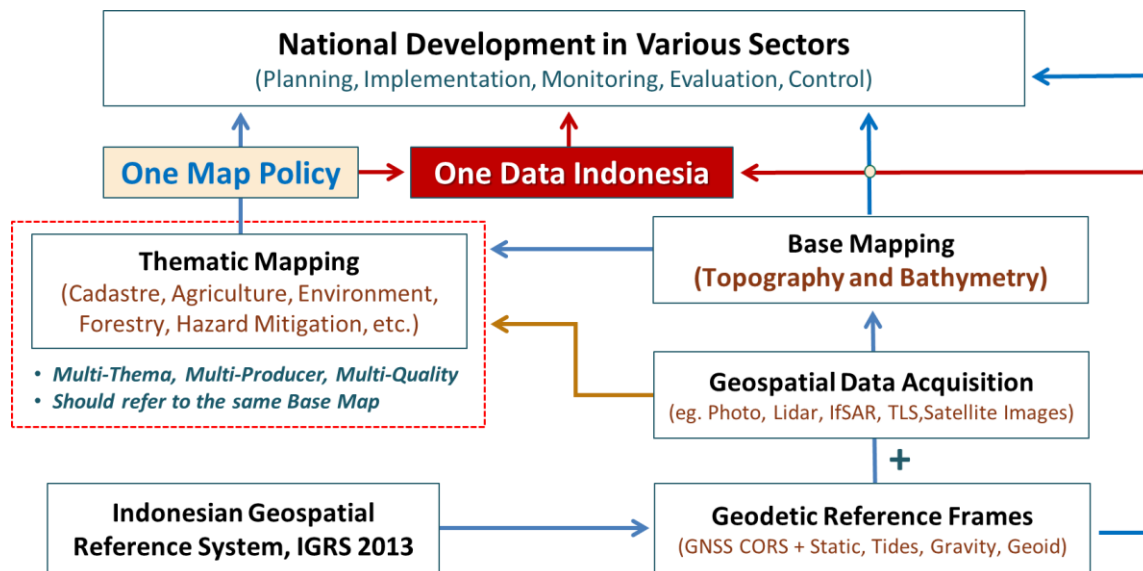Virtually in the Netherlands, 21–25 June 2021

Figure 2. The roles of geospatial information for national development.

2. ONE MAP POLICY: STATUS

2.1 Thematic mapping problems in Indonesia

Geodetic control network measurement for mapping purposes in Indonesia has been started since the Dutch colonial era in 1862, mainly based on the method of measuring triangulation and astronomical observations (*Schepers & Schulte,* 1931). Therefore, it is estimated that base mapping and thematic mapping in Indonesia was carried out systematically after the procurement of those geodetic control networks.

If we study the history of base mapping in Indonesia, usually in a certain period there is only one government agency that is responsible for making the base map (*Bakosurtanal,* 2019). Currently the institution that is legally responsible is the Geospatial Information Agency of Indonesia (BIG), an agency formerly known as the National Coordinating Agency for Surveys and Mapping (Bakosurtanal). The main challenges in base mapping are generally in the updating of map contents, establishment of base maps at a larger scale and wider coverage, modernization of the geodetic datum for mapping, and modernization of mapping technology.

Thematic mapping is generally done after base mapping because thematic maps must be made on top of the base map of the area concerned. In contrast to base mapping, thematic mapping in Indonesia can be carried out by ministries and agencies, local governments (provinces, districts, cities, and villages), the private sector, non-governmental organizations (NGOs), and the wider community. This will then lead to several unwanted problems. Figure 3 shows some of the problems related to thematic mapping and thematic maps in Indonesia that we often encounter in the field, along with the negative impacts that occur.

THEMATIC MAPPING:
✓ Thematic mapping carried out by the central and local governments and non-governmental institution has not been well coordinated.
✓ The number of thematic maps is relatively large and not all of them are clear who their custodian are.
✓ The same thematic maps are often published by more than one party without coordination;
✓ Thematic maps often use different base maps;
✓ Thematic maps have not all been stored in a digital database that is easy to access and share quickly.

THEMATIC MAPS :
✓ The references and standards are not uniform.
✓ Map accuracy is still diverse.
✓ Not always up-to-date.
✓ Accessibility is still a problem.
✓ Data sharing is often difficult.

• Provide less or inaccurate spatial information.
• The low quality of spatial based decision making.
• Overlapping and conflicts in land use and area boundary.
• Land use that is not in accordance with the Spatial Plan.

• The climate of development and investment becomes not conducive.
• Achievement level of local and national development is decreasing.
• Fostering a culture of corruption, collusion and nepotism in the land use sector.
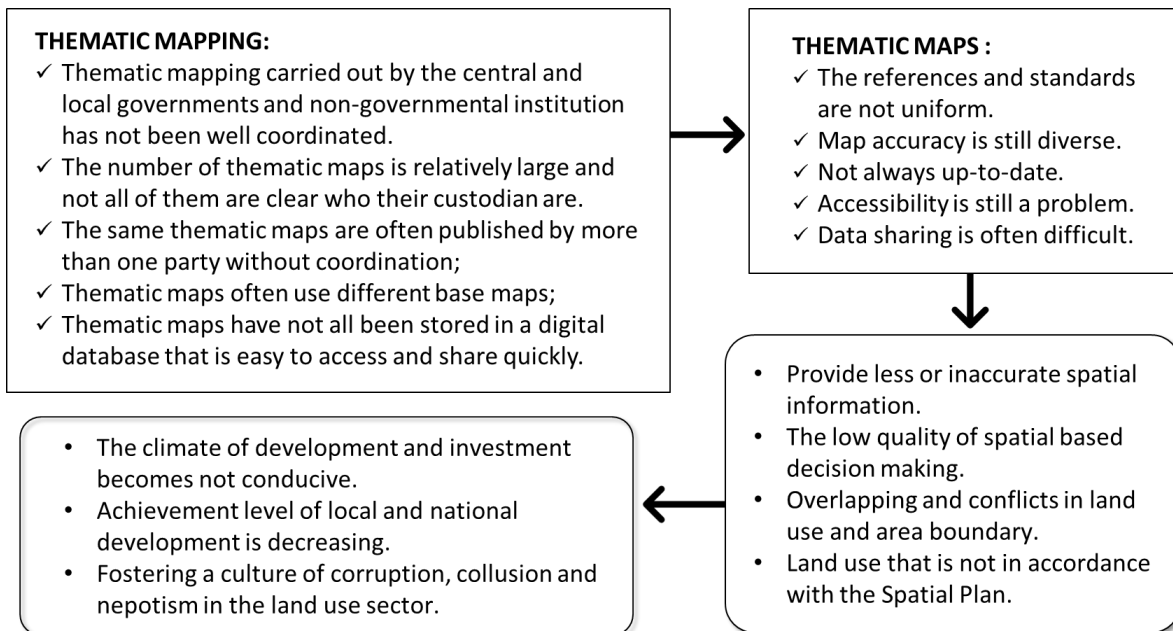
Figure 3. Several thematic mapping problems in Indonesia and their impacts.

2.2 The Needs of One Map Policy in Indonesia

Due to the existence of several problems related to thematic mapping and thematic maps in Indonesia so far as indicated in previous Figure 3, in the field it is often found that there are overlaps in land use. Overlapping land use between mining, plantation, and forestry areas often occurs. In this case, more than one authority from different regions sometimes issues permit in the same location (overlapping borderline), which leads to border area conflict. In another case, various land use permits sometimes overlapping in the same region, which leads to land disputes. Sometimes this overlapping problem is also made more complicated because it also violates the spatial planning regulation in the area. These overlapping problems will in turn create legal, social, economic, and environmental conflicts which in turn result in unattractive investment conditions, hinder the development process, delay project completion, and waste development energy.

To overcome this problem, a standardized, accurate and accountable thematic map system is needed as a reference for all stakeholders in preparing development planning and related aspects. For this reason, the Indonesian government on 4 February 2016 issued the One Map Policy program which is expected to solve several problems in land use. This is regulated in Presidential Regulation No. 9 of 2016 concerning the Acceleration of the Implementation of the One Map Policy at a map accuracy of 1: 50.000 scale. The general characteristics of One Map Program is depicted in Figure 4. More detailed information about the One Map Policy program can be seen in *Karsidi* (2016) and *Sarbini* (2019).

The goal of this OMP program is to compile, integrate and synchronize 85 thematic maps selected from 19 participating ministries and agencies to have one georeference, one standard, one database, and one geoportal. In this case, one georeference means that all thematic maps

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use the same base map and the same geodetic reference system, namely the Indonesian Geospatial Reference System, SRGI 2013 (*SRGI,* 2021). One standard means that all thematic maps use the same standard regarding the geographic elements, attributes, metadata, and thematic mapping methods used. One database means that all thematic maps from OMP must be in one database and not spread over several locations, making it easy to find and access. One geoportal means that all OMP products must be managed with one geoportal system to streamline and optimize the data sharing of OMP products between stakeholders through a national geospatial infrastructure network. The 85 thematic maps of OMP can be categorized into several large themes, namely Infrastructure (21 maps), Forestry (6 maps), Natural Resources, Environment, and Disaster (29 maps), Regional Boundary (5 maps), License and Permit (7 maps), Regional Planning (9 maps), and Specific Area and Transmigration (8 maps).
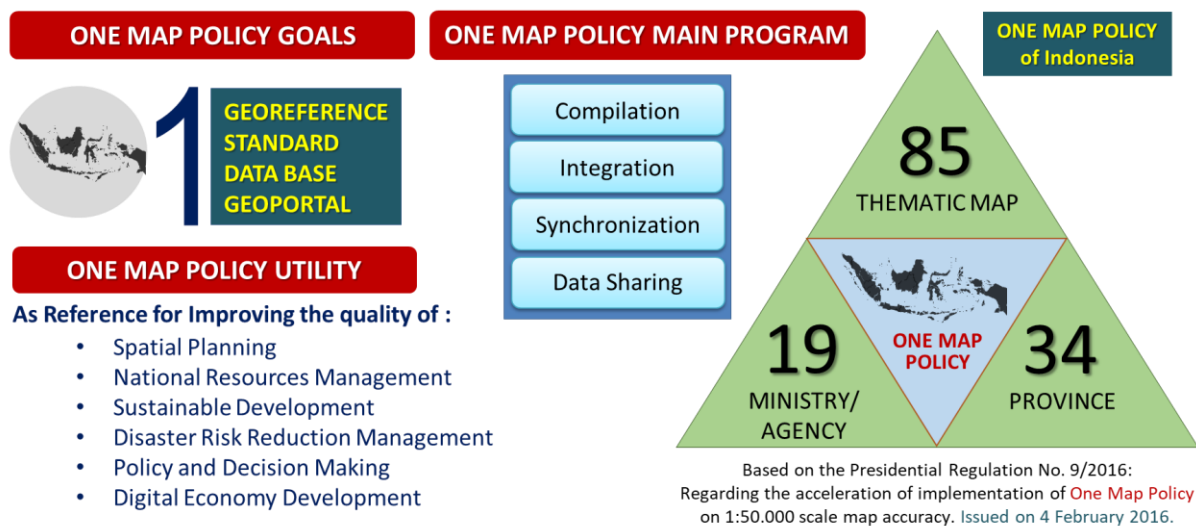

Figure 4. General characteristic of One Map Policy (OMP) program.

The implementation of OMP involves many government agencies at the central level (19 Ministries/Agencies) and Local Governments in 34 Provinces. To accelerate the implementation of OMP, the Government formed the OMP Acceleration Team chaired by the Coordinating Minister for Economic Affairs and consisting of several Ministries and Geospatial Information Agency.

2.3 Compilation and Integration Stages

The One Map Policy program consists of four main stages, namely compilation, integration, synchronization, and data sharing. The compilation is the activity stage of collecting, submitting, and storing thematic maps from various ministries/institutions which are custodians of the corresponding thematic maps. The purpose of compiling thematic maps is to collect them for integration and synchronization. Integration is a phase of activities to align thematic maps with base maps and standard geospatial databases. This integration activity includes verification

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and editing of thematic data collected from the map custodian. The objective of integration is to ensure the quality of the thematic maps according to the base maps and predefined standards.

The compilation and integration stages of One Map Policy are carried out in stages region by region as shown in Figure 5. 2016 begins with the Kalimantan region, 2017 for the Sumatra, Sulawesi, Bali and Nusa Tenggara regions, and 2018 for the Java, Papua, West Papua, Maluku, and North Maluku regions.
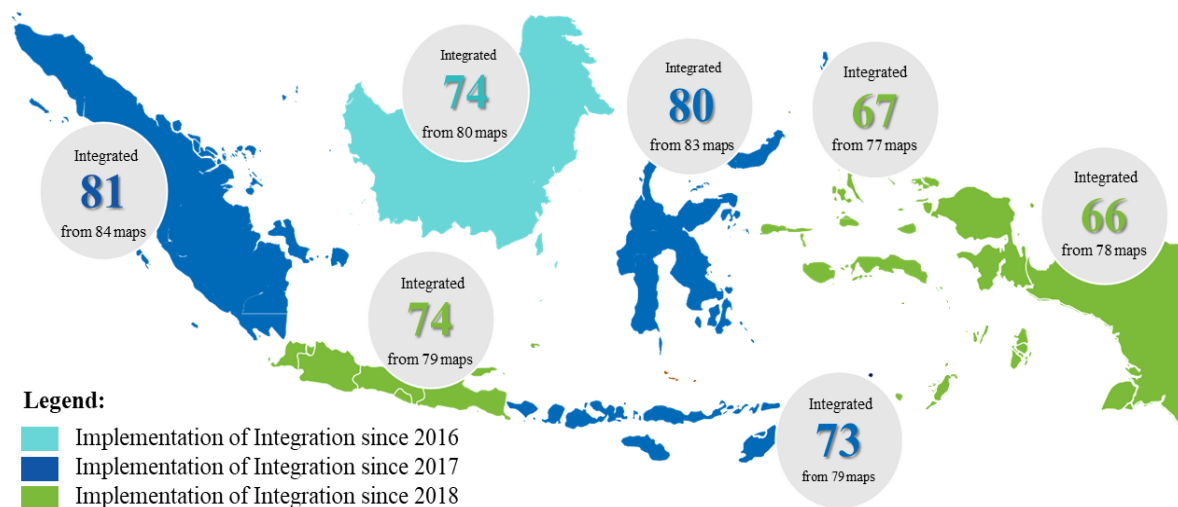

Figure 5. The status of integration stage achievement by February 2020.

In general, the stages of compiling and integrating 85 thematic maps for the entire territory of Indonesia have been carried out relatively well. Until February 2020, the compilation stage of 85 thematic maps has generally been completed, with a note that the most recent compilation is the village/*kelurahan* boundary administrative maps with a scale of 1: 10.000 are mostly still an indicative (cartometric) maps, and only 362 village/*kelurahan* maps have been definitive, out of more than 83,400 villages/*kelurahan* of Indonesia.

The achievements of the integration stage of the One Map Policy in each island region or island group are shown in Figure 5. The achievements are different for each region. As of February 2020, in the Kalimantan region 74 of the 80 thematic map targets have been integrated (92.5%), in Sumatra 81 of the 84 thematic maps have been integrated (96.4%), in Sulawesi 80 of the 83 thematic maps have been integrated (96.4%), in the Bali and Nusa Tenggara region 73 of the 79 thematic maps have been integrated (92.4%), in Java region 74 of the target 79 thematic maps have been integrated (93.7%), in the Maluku and North Maluku region 67 of the target 77 thematic maps have been integrated (87.0%), and in the Papua and West Papua region 66 of the 78 thematic maps have been integrated (84.6%).

It should be noted here that the thematic map targets for each region do not reach the 85 thematic maps. This is because not all thematic maps naturally exist in all regions, for example, maps of peatlands on the island of Java, as well as maps of the distribution of railway networks and railway stations in Papua and West Papua regions. In addition, there are thematic maps that have not been integrated because they are still under procurement or nationally note yet

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complete, for example, land cover map, land system map, morphometric map, and village boundary administrative map.

2.4 Synchronization Stage

The main objective of the synchronization phase of the One Map Policy is to synchronize the integrated thematic maps with the main objective of resolving overlapping land uses. Synchronization of thematic maps is carried out through 3 (three) activity stages, namely identification of overlaps, analysis of overlapping solutions, and implementation of overlapping solutions. The data source for synchronization is integrated thematic maps, especially those related to land use status.

Figure 6 shows one of the products of the synchronization stage, namely the Indicative Map of Overlapping Thematic Geospatial Information (PITTI) for Indonesia. More detailed PITTI for the six regions as shown in Figure 5 have also been produced. PITTI for the six regions has been legally established through a Decree of the Coordinating Minister for Economic Affairs of Indonesia, each with a detailed number as follows, namely for Sumatra Island (No. 280/2019), for Kalimantan Island (No. 281/2019), for Java Island (No. 308/2019), for Sulawesi Island (No. 309/2019), for Bali Island and Nusa Tenggara (No. 310/2019), and for Papua Island and Maluku Islands (No. 311/2019)**.**
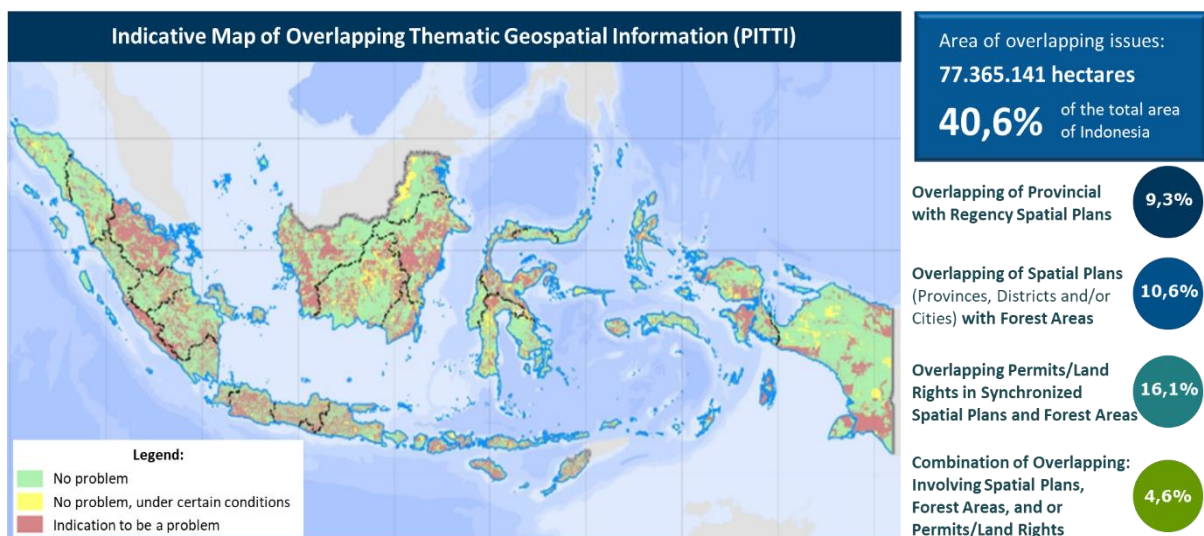

Figure 6. One of the achievements of the synchronization stage in February 2020.

After identifying and analyzing indications of overlapping thematic maps which are then outlined in the form of PITTI, it is necessary to formulate base rules to address existing overlapping problems. As of February 2020, the One Map Policy Acceleration Team has prepared 15 bas**e** rules to resolve overlaps between thematic maps, both for overlapping problems in Forest Areas and in Non-Forest Areas. The team has also formulated that solving overlapping problems is based on the following four basic principles: (1) legal legitimacy, where each overlapping problem resolution mechanism is based on a legal basis that is valid

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and has binding power; (2) <u>respect for people's rights</u>, where people's rights take precedence over other interests, as long as these rights can be proven physically and administratively; (3) <u>investment certainty guarantee</u>, where the resolution of overlapping problems is carried out to encourage investment through guaranteeing the rights of a legal business entity; and (4) <u>paying attention to sustainable development</u>, where base rules are applied while still paying attention to the preservation of ecosystems and environmental sustainability.

It is noteworthy here that the 2019 One Map Policy Acceleration Team has conducted trials to resolve overlapping land use problems in 3 districts, namely Kotawaringin Timur Regency (Central Kalimantan), Muara Enim Regency (South Sumatra), and Mukomuko Regency (Bengkulu). Henceforth, with the availability of PITTI for each region and the existence of base rules to address the overlapping land use problem, the process of resolving overlaps in the field can be carried out, especially by the relevant local governments (province, district, and city) with assistance from related ministries and agencies.

It should be noted here that the government has enacted Government Regulation of the Republic of Indonesia No. 43 of 2021 concerning "Resolving Inconsistencies in Spatial Planning, Forest Areas, Permits, and/or Land Rights", which is a derivative of Law No. 11 of 2020 concerning Job Creation. The PITTI map produced from the One Map Policy program has a strategic role in the implementation of this new government regulation.

2.5 Data Sharing

The results of the One Map Policy (OMP) activity in the form of a dataset of 85 integrated thematic maps are published in the OMP Geoportal, which then is shared via the National Geospatial Information Network (JIGN). In accordance with Presidential Regulation No. 27/2014, JIGN functions as a means of sharing and disseminating geospatial data and information in Indonesia through the network nodes of the JIGN geoportal built by the Geospatial Information Agency of Indonesia (BIG). The JIGN geoportal is called the InaGeoportal, whose more detailed characteristics can be seen in *InaGeoportal* (2021). The OMP geoportal (*GeoportalKSP,* 2021) is part of the JIGN InaGeoportal. Currently, the public can access geospatial data and information on this InaGeoportal for free, except for One Map Policy products.

The implementation of data sharing in the OMP Geoportal is regulated in Presidential Decree of the Republic of Indonesia Number 20 of 2018 and Regulation of the Coordinating Minister for Economic Affairs of the Republic of Indonesia Number 7 of 2018. In accordance with the mandate of the Presidential Decree, data sharing from the One Map Policy is aimed at access holders consisting of the President and Vice President, the Coordinating Minister for Economic Affairs, the Minister for National Development Planning/Head of National Development Agency, Head of Geospatial Information Agency, Ministers and Heads of other Agencies, Governors, and Regents/Mayors.

Each holder of access rights has different access rights to various layers of information. Based on these rules, data access to OMP geoportal through JIGN are classified into 3 (three) categories, namely: (1) <u>downloading</u>, where the access holder has the authority to view and download the OMP products, (2) <u>viewing</u>, where the access holder has the authority to view OMP products but cannot download, and (3) <u>closed</u>, where the access holder does not have the

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authority to view and download the OMP products. It should be noted that to access the OMP geoportal, those with access rights still need a username and password.

2.6 Presidential Directive on Further Development

In the launching of the One Map Policy Geoportal on 11 December 2018, the President of the Republic of Indonesia Joko Widodo gave several directions regarding the further development of the One Map Policy program, namely (*Setkab*, 2021):
1. Ministries and agencies should immediately add thematic maps as needed to solve overlapping land use problems.
2. Ministries, agencies, and local governments should immediately utilize the Indicative Map of Overlapping Thematic Geospatial Information (PITTI) as a working map to resolve overlapping land use issues.
3. Ministries, agencies, and local governments should immediately utilize the One Map Policy product in spatial-based development planning.
4. Ministries, agencies, and local governments should collaborate to resolve overlapping land-use problems in the field.
5. Local governments must strive to accelerate the determination of village boundaries and coordinate technical aspects related to mapping with the Geospatial Information Agency of Indonesia (BIG).
6. BIG should establish an effective data updating mechanism and prepare base maps at a larger scale so that ministries, agencies, and local governments can initiate thematic mapping on a larger scale.

The above Presidential directives have been followed up by the ministries and agencies involved in the implementation of the One Map Policy program, although the level of progress of the follow-up of each of the above points is not the same.

3. ONE MAP POLICY: CHALLENGES AND PROSPECTS

After the implementation of the OMP program since 2016, according to the president's direction above and based on the experience of implementing the OMP so far, there are several challenges and opportunities that need to be followed up. Some of them are briefly discussed below.

3.1 Addition of New Thematic Maps and Map Updating

Based on the president's direction number 1 above and based on the perceived need in the planning and implementation process of development in various sectors, it is necessary to increase the number of thematic maps that need to be integrated and synchronized. Several thematic maps have been proposed by Ministries and Agencies to be added to the planned revision of Presidential Regulation no. 9/2016 on One Map Policy, in addition to the existing

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85 thematic maps. The proposed new thematic maps will include themes of maritime, disaster, spatial planning, land, licensing/permit, economy, finance, and synchronization support.

In the revision of the above presidential regulation, which is almost final, it is planned that the number of thematic maps will be 158 from the previous 85 thematic maps, and the participating Ministries/Agencies will be 24 from the previous 19 Ministries/Agencies. The exact number of the new thematic maps and Ministries/Agencies involved in the OMP program for the next period (2020-2024) will be known after the latest Presidential Regulation is signed.

It should be noted here that increasing the number of thematic maps and related Ministries/Agencies will increase the functional capacity of the OMP program. On the other hand, the coordination and implementation burden at all OMP stages (compilation, integration, synchronization, and data sharing) will also increase.

Another challenge that must be kept in mind is that the thematic maps involved in the OMP program must be updated periodically, both in terms of content and the basemap.

3.2 Utilization of the One Map Policy Products

The thematic maps of the One Map Policy (OMP) have begun to be used by Ministries, Agencies and Local Governments to support various spatial-based priority programs, at the central and regional levels. This is in accordance with presidential directives number 2 and 3 above. The development programs that can take advantage of the One Map Policy products include:

1. Improving the quality of the spatial plan, where in this case the thematic maps that have been standardized and updated from the integration stage of the OMP are used in the preparation of spatial plans.
2. Agrarian Reform, where in this case the OMP thematic map indicating resources for Land Objects for Agrarian Reform (TORA) is one of the composing components of the Indicative Map of Overlapping Geospatial Information (PITTI map) which is used to monitor the implementation of Agrarian Reform and resolve overlapping land uses.
3. Online Single Submission (OSS), where in this case the thematic maps of the One Map Policy program can be used in the process of identifying areas with good potential for development by investors.
4. Compilation of Detailed Spatial Plans to support the acceleration of good conditions for business and investment, which in this case will also encourage related ministries, agencies, and local governments to accelerate the preparation of Detailed Spatial Plans.
5. Settlement of overlapping and conflicting land uses; where in this case the Indicative Map of Overlapping Geospatial Information (PITTI map) which is a product of the One Map Policy is used as a reference in resolving overlaps and land use conflicts in the related area.
6. The Palm Oil Moratorium, where in this case certain thematic maps from the One Map Policy can assist the verification process of oil palm cover in forest areas.
7. National Movement to Save Natural Resources (GNP-SDA), where in this case the synchronized PITTI map from OMP program is used as one of the bases in implementing GNP-SDA.
8. The Master Plan for the Acceleration of Economic Development (RIPPE) in East Java and Central Java, where in this case the thematic maps from the OMP program will be useful

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in the preparation of the Master Plan, particularly those related to increasing connectivity and overall economic development.

The biggest challenge in utilizing the OMP product for the above programs is to build a culture of effective and efficient collaboration between related ministries, agencies, and local governments. As the president direction no. 4 given in previous section, it is necessary to have good cooperation between those parties to resolve overlapping land use issues, which is one of the main objectives of the OMP program.

3.3 Availability of Geospatial-related Human Resources and Institutional Units

From the experience of implementing the OMP program for the (2016-2019) period, it was found that one of the factors that determined the success of the OMP implementation was the availability of geospatial related human resources with adequate quantity and quality, within the ministries, agencies, and local governments participating in the OMP program.

Based on the observations made in the field, from the 19 Ministries/Agencies participating in the OMP program, only about 25% have adequate geospatial-related human resources, and even most of these institutions do not have a special unit that handles their thematic mapping activities. The condition of geospatial related human resources and institutional units at the local government level (province, district, city) is also relatively similar, and the conditions need to be continuously improved.

It needs to be emphasized here that without the support of good and reliable human resources and a special unit related to geospatial in the related ministries, institutions and local governments, the implementation of the OMP program in the future will not be optimal. Especially considering the number of thematic maps and the ministries/agencies involved will also increase. The challenge related to the provision of adequate human resources and good implementation units related to geospatial at the ministry, agency, and local government levels is not a small challenge, given the vast area of Indonesia with its diversity of geospatial infrastructure. This challenge needs to be followed up seriously and resolved systematically by the central and local governments.

3.4 Improving the Data Sharing System

One of the most important stages of the OMP is sharing data through a geoportal among participants who have access rights to the One Map Policy product. Because sharing this data uses the National Geospatial Information Network (JIGN) facility, JIGN's performance must be continuously improved, and the number of its network nodes must be increased so that it can connect all Ministries, Agencies, and Local Governments. Currently, InaGeoportal of JIGN is connected via network nodes to 29 ministries (out of 60), 34 provinces, and 201 districts/cities (out of of 514) (*Simojang,* 2021). The biggest challenge today is connecting network nodes to remote districts/cities, especially in eastern Indonesia, where the communication and internet infrastructure is relatively inadequate.

In addition, the access speed of OMP products through JIGN also needs to be improved. Ideally, this access speed is relatively the same in all regions of Indonesia, from Sabang to

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Merauke. Given that the number of thematic maps involved in OMP will increase soon, the capacity and security of the OMP data center also needs to be improved.

In this case, the use of 4IR technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), Big Data Analysis, Cloud Computing, and Blockchain Technology also needs to be considered to improve the performance of the data sharing system of OMP.

3.5 Going to Larger Scale

Currently the thematic maps of the OMP program generally have a scale of 1: 50.000. This is mainly due to the availability of a complete base map at this scale for the entire mainland area of Indonesia. Although large scale base maps such as 1: 1000 and 1: 5000 are also available, they are still relatively minimal in coverage and scattered over several locations. To support various current government programs, large-scale thematic and base maps are increasingly needed, namely for village mapping (1: 5000), detailed spatial planning (1: 5000), peatland management (1: 2500), development of special economic zones, and industrial areas (1: 1000), smart city development (1: 1.000), acceleration of land certification (1: 500 to 1: 5000), as well as for disaster mitigation and adaptation (1: 1000 to 1: 5000).

It is not an easy task to establish large-scale base maps for Indonesia's vast and archipelagic territory, with its heterogeneous topographical and meteorological conditions. Several challenges that must be faced namely are that the completion time will not be short, a relatively large budget is required, relatively sophisticated mapping technology is required, good support from the geospatial industry is needed, and the need for mapping-related human resources in sufficient quantity and quality. Currently, the Indonesian government through BIG will soon begin a large-scale national mapping program on a systematic basis, and it is estimated that it will take several years to complete.

3.6 Integration with One Data Indonesia program

To be more useful for decision making, geospatial data and information must be integrated with other non-spatial data and information, such as statistical, demographic, social, economic, environmental, and other data. Therefore, the One Map Policy program should be combined and synchronized with the One Data Indonesia program (*ODI*, 2021), as depicted in Figure 7. The integration of these two major government programs will be very useful in supporting various activities, such as development planning and budgeting, realization of the Sustainable Development Goals (SDGs), and handling urgent conditions, such as in the case of natural disasters and disease pandemics.

3. CLOSING REMARKS

The One Map Policy Program currently integrates and synchronizes thematic maps of the government sector. As we know, thematic maps in Indonesia can also come from the non-government sector, such as from the private and industrial sectors, NGOs, and society in general. For example, the non-governmental sectors engaged in agriculture, plantation, environment, forestry, mining, and energy have produced quite a lot of thematic maps to

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support their respective work activities. Combining thematic maps of the government and non-government sectors will have many benefits, and therefore it is necessary to think about their realization in the future. For this thematic map integration process to run well, of course it needs to be supported by the required regulations and standards.
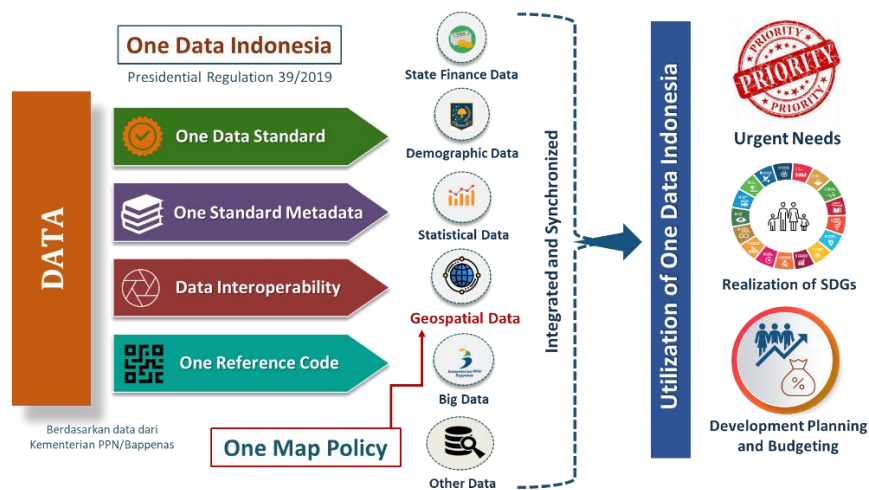

Figure 6. Possible integration of One Map Policy and One Data Indonesia programs.

It should also be noted that currently One Map Policy products generally can only be accessed by parties from the government sector who have access rights. Currently, there are requests from non-governmental parties so that they can also access One Map Policy products within certain limits. This request needs to be considered properly by the government in the future, especially if it brings positive benefits to the public. This request needs to be considered well by the government in the future, especially if it brings positive benefits to the community. In this case, if the government later approves the access of non-government parties, even though it is still limited, it is necessary to prepare related rules, mechanisms, and protocols.

DISCLAIMER

In this paper, statements and ideas related to challenges and prospects of the One Map Policy program, do not or do not necessarily represent the official stance of the Coordinating Ministry for the Economy and/or the Indonesian Geospatial Information Agency of Indonesia. Generally, these are the statements and ideas of the main author.

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