

Integrated Spatial-Development Planning (InS-Dep) for Marine Space Utilization of the Coastal Village Communities

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Abstract. Marine space is inseparable from the livelihood of the communities in coastal villages in terms of utilizing marine resources, as the main occupation of the people is fisherman. They need to secure marine areas in front of the village, however, the village government hold authority neither in planning nor managing the marine space for village development in the formal spatial planning. This study attempted to identify challenges and opportunities in developing a village master plan for utilizing of marine space. This study carried out through participatory action during the process of village development planning (RPJMDes) by implementing Integrated Spatial-Development Planning (InS-DeP) model. This model integrates spatial plan into the development plan by constructing a village masterplan that includes plans for utilization of the marine space that complements development programs. From a series of FGDs, it is observed that InS-DeP model faces challenges in technical mapping and lack of knowledge regarding alternative livelihood options in developing the plan for future uses. Through this experience, by implementing InS-DeP model, coastal village government can prepare a master plan for marine space as a consensus with the community to ensure a balance between exploitation and conservation activities.

1 Introduction

Spatial planning is one of the functions of the public sector (government) that influences the spatial distribution of future activities. The aim is to create a more rational, organized land use and inter-regional linkage to balance development demands and the need for

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environmental protection and achieve social and economic objectives [1]. Spatial planning coordinates and enhances the impact of other sectoral policies on land use to achieve equitable economic development within the planned area [2].

Regulations regarding spatial planning are contained in Law Number 26 of 2007, later updated in Law Number 11 of 2020 concerning Job Creation, regulated in Government Regulation Number 21 of 2021 concerning Implementation of Spatial Planning. Formally, the spatial plan is compiled into a Regional Spatial Plan (RTRW) document starting from the national, provincial, city/regency levels (Regulation of the Minister of Agrarian Affairs/Head of BPN No. 11 of 2021 concerning Procedures for Compilation, Review, Revision, and Issuance Approval of the Substance of Provincial, Regency, City Spatial Plans and Detailed Spatial Plans), in which the implementation of spatial planning is regulated in the Regulation of the Minister of Agrarian and Spatial Planning/Head of the National Land Agency of the Republic of Indonesia Number 21 of 2021 concerning Implementation of Control of Spatial Utilization and Supervision Spatial planning.

In this case, spatial planning is planning the development of a space (land, sea, air) according to its designation to achieve specific goals. In practice, spatial planning goes hand in hand with development planning. Development planning is an effort to use limited development resources (including economic resources) to achieve specific goals based on better socio-economic conditions effectively and efficiently.

In Indonesia's national spatial planning system, the most detailed spatial planning is at a scale of 1:5000, namely in the Detailed Spatial Planning (RDTR) document. RDTR is the detail of the RTRW in a predetermined planning area (BWP). BWP is determined based on criteria, namely whether the existing condition has urban characteristics or is planned to be developed into an urban area. So, in this case, the use of space in rural areas refers directly to the Regency RTRW, whose scale is 1:50,000.

Villages are areas with the authority and budget to prepare development plans, producing a product as a Village Medium Term Development Plan (RPJMDes). Details of the implementation of the RPJMDes are outlined in the Annual Work Plan, which is supplemented by the Village Expenditure Budget (APBDes). Village spatial planning refers directly to RTRW, which is still general. However, in practice, village spatial planning at a detailed scale is needed to accommodate village development programs that utilize space directly or indirectly.

Preparing the RPJMDes based on strategic planning emphasizes the formulation of programs implemented in exploitation and conservation activities, which are very closely related to spatial use. Spatial aspects need to be integrated into the development plan so that the programs in the development plan can be mapped explicitly by designating locations (points, lines, polygons) and quantities (amount, length, area). Integrating spatial aspects into development plans, in this case, the RPJMDes will clarify the direction of development in optimally utilizing and developing space in village areas; this will also have implications for budgeting and permitting village development activities.

In the context of a coastal village, the use of space for community activities is limited to the land area and the sea area. Marine areas must be kept from the livelihoods of communities in coastal villages that utilize marine resources. Even so, the coastal village government needs administrative authority in planning or managing the sea area in front of its village as part of village development. In addition, natural marine ecosystems that support the livelihoods of coastal village communities need to be preserved for long-term sustainability. Therefore, a policy set is needed to direct the use of space to ensure a balance between utilization and conservation activities in marine space.

By considering village development needs and authority over formal spatial planning, Integrated Spatial-Development Planning (InS-DeP) model is introduced to accommodate village spatial plans integrated into short-term, medium-term, and long-term village

development plans outlined by a Village Masterplan. The Village Masterplan is prepared in a participatory manner and is oriented towards sustainable development (SDGs), in which the use and development of space complements development programs. This integrated planning model focuses on land space, which is the administrative area, and places sea space in the village space management planning section. In this integrated planning model, the interconnectedness of functions, patterns, and spatial structures between land space and sea space can be described explicitly in comprehensive spatial dimensions, complementing development planning, described in partial and thematic program narratives. The Village Masterplan is the basis for decision-making regarding stakeholder policies, both government from the village to the national level, community, and other parties regarding the use of land and sea space and the resources contained therein for the development of coastal villages. In implementing InS-DeP model in wider scale, it is necessary to identify challenges and opportunities of its process in the real case. This study observed the practical implementation of InS-DeP during the process of RPJMDes preparation in a coastal village to find what obstacles and potential that the stakeholders faced. So that it will be followed up with the suitable strategies to address, and the coastal village communities could carry out the model properly in order to achieve sustainable marine space utilization.

2 Methodology

This study takes place in Bulutui Village, part of Likupang Barat District, North Minahasa Regency, with a land area of 1.63 Km² [3]. The village community relies on fishery and recently developed octopus fishery as their alternative livelihood. In purpose to protect the octopus collection sites, the *hukum tua* (village head) issued Peraturan Kepala Desa (Village Head Regulation) regarding octopus fishery management [4]. Figure 1 below shows the marine space utilized by the community for octopus fishery activity extended further from their land area.

Integrated Spatial-Development Planning (InS-DeP) is a model for carrying out sustainable village development that internalizes spatial planning based on activity and environment in a participatory manner in the RPJMDes preparation process. Its application is in synergy with the preparation of a coastal village development plan based on the Village SDGs with an emphasis on spatial aspects as the basis for the utilization and development of village space as well as being a means of controlling spatial use by coastal village communities, both in land and sea spaces. The product of this planning model is the village master plan, which is agreed upon, ratified, and implemented by all stakeholders in the village. The InS-DeP model is implemented by starting from a comprehensive understanding of village characteristics to preparing a spatial plan and its implementation (Figure 2). At each step, active collaboration between stakeholders is needed to produce a mature plan that can positively impact all parties. The emphasis on spatial planning is oriented towards development for the benefit of human life and the natural environment to realize sustainable development.

This study is attempted to identify the challenges and opportunities in implementing InS-DeP model using real case through participatory action. A series of FGDs held in January 2023, participated by the village head, fishermen communities, women communities and youth communities. These FGDs goes hand in hand with the process of preparing the RPJMDes. Hence, the consensus obtained in this forum become noteworthy inputs in constructing development programs in the RPJMDes. Challenges and opportunities obtained through observation towards the FGD process.

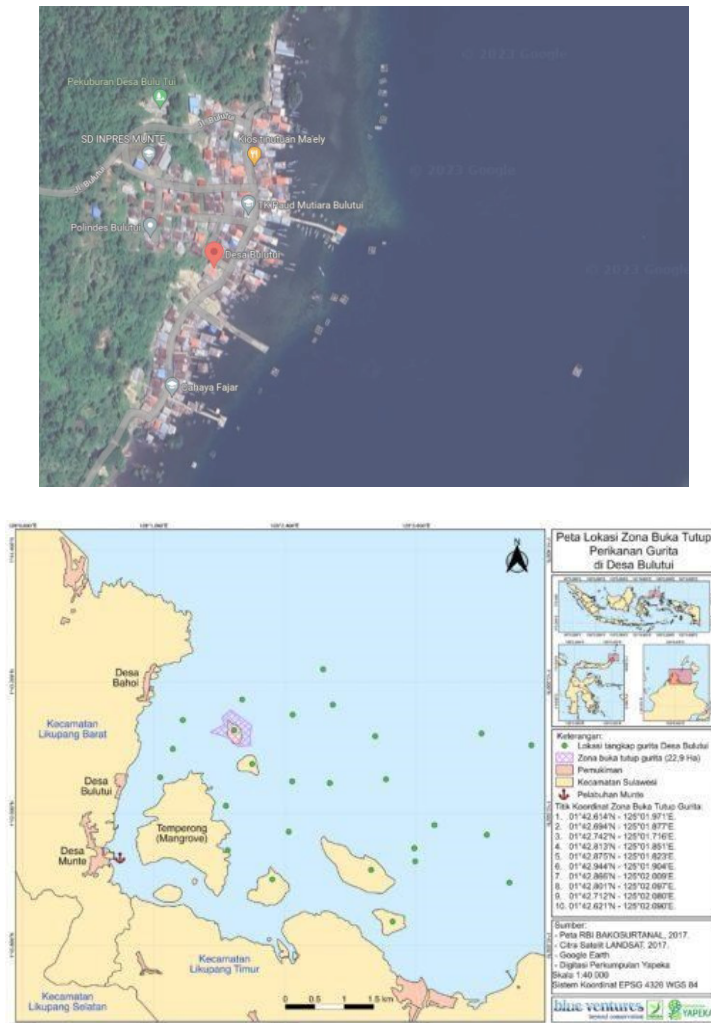


Fig. 1. Bulutui village position and their octopus fishery sites.

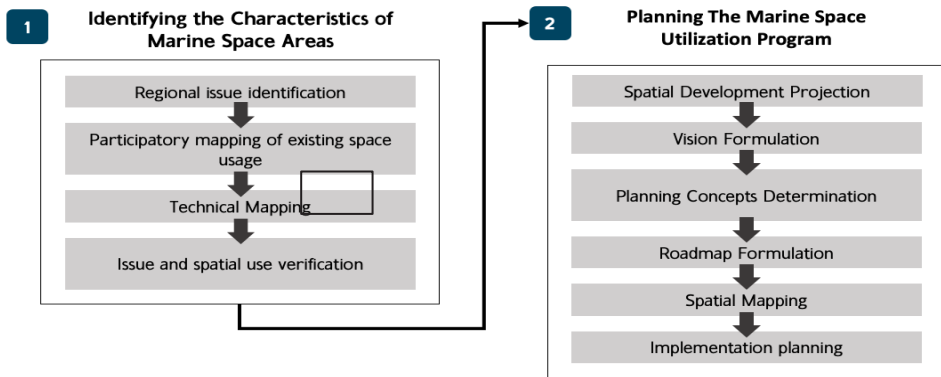


Fig. 2. Integrated Spatial-Development Planning (InS-DeP) model framework.



Fig. 3. Integrated Spatial-Development Planning (InS-DeP) workshop with village administrators and community representatives.

3 Results and Discussions

3.1. Identifying the characteristics of marine space areas

Identification aims to identify, find out the village's identity and find out the needs required by the village. In this process, data and information are collected regarding village characteristics as a whole/comprehensive, identification of village assets, and village development issues in the form of potential and existing problems. Potential refers to everything that supports village development in a better direction, while problems are everything that hinders village development. In addition, it is essential to identify activities (exploitation and conservation) and use of existing space on land and sea. Inland space identification uses space for activities within the delineation of village boundaries and their interactions with the surrounding area. Meanwhile, in marine space, space utilization includes marine space in front of the village, particularly within a 2-mile radius, i.e. octopus fishery field.

This process carried out by field observation, secondary data collection, SWOT (Strength, Weakness, Opportunity, Treat) analysis, and focused group discussions (FGD). The identification results can be a short description or points that are priorities in completing village construction and development. The result of this process is a comprehensive village profile that represents the conditions and dynamics occurring in the field.

The data and information collection results from the previous process are then inventoried systematically and organized in a well-managed database system. A tabular database can monitor village dynamics, such as changes in characteristics, assets, issues, and community activities. This is done as a database in the plan preparation process and as measurable monitoring and evaluation.

Mapping the use of existing space is the creation of maps carried out by village community members regarding history, regional spatial planning, land use, use of natural resources, and boundaries of the areas where they live. This stage is a simultaneous process along with the regional issue identification process, namely data and information inventoried in spatial information in the Village Information System, outlined in a map to show spatial location (points, lines, polygons) in precise coordinates. This map functions as a tool to

communicate local community knowledge to outsiders. At this stage, the village community creates the map using a participatory mapping approach (Figure 4).

Society generally has a strong bond with maps because human thoughts and activities are directly and indirectly related to the space around them [5]. The map can be in the form of verbal information or unwritten thought ideas, which can then be extracted and translated into written knowledge in the form of a mental map. Participatory mapping is implemented through a series of FGDs or other informal village meetings. The public is asked to observe basic maps in printed format, which cover land and sea areas. Next, people are asked to identify and delineate every object on land and sea that can be recognized from the base map using writing tools. Finally, the public is asked to provide information about the object's name, size, and area identified and de-initiated by drawing a boundary line to form and mark a particular object or area.

The activity of making technical maps using GIS tools, both hardware and software, carried out by professional personnel or trained village officials. Making technical maps using map sources from credible data guardians. Referring to the One Map Policy, the resulting map must be synchronized with the Geospatial Information Agency (BIG) mapping system.

Spatial data and information regarding village resources, which are only stored in the mental maps of local communities, can be transmitted in the form of spatial data, which has a clear and standard basis for determining location (coordinates, quantities, lengths, areas, units), and can strategically support spatial information. The community confirms every object described in the field (field tour). This activity aims to ensure the truth and accuracy of spatial data and information. In this case, efforts must be made to increase the community's capacity for a sense of place, namely, the community's ability to understand boundaries and thresholds, place systems, place character, identity and orientation, and the spirit of place [6]. In verifying objects, people can use tools such as GPS to help record coordinates and verify with Google Maps.



Fig. 4. Participatory mapping process through field observation (left) and technical mapping (right).

3.2. Planning the marine space utilization program

This stage is the step in forecasting or projecting future situations and conditions. The development projections that will be estimated are population growth, settlements, activities, public and social facilities, water needs, energy needs, and food needs. Generally, the stage of projecting future situations and conditions is through considering and comparing existing tendencies/trends through available data from year to year. Next, the data shows whether it

is increasing or decreasing, which coincides with projected future trends (for example, population projections in the next 5 - 10 years).

In the vision formulation stage, data from various sources is internalized into a vision. A vision is a general formulation regarding the desired conditions at the end of the village development planning period, which is based on the potential and needs of the village. Having a vision makes it easier to direct all resources to create the desired final condition. Generally, the vision is determined through discussion and direct observation of the community, and then a vision is formulated based on common interests. Observation through extracting ideas and ideas from all community groups through FGD or village deliberation approach.

The predetermined vision needs to be realized and developed through a concept. A concept is an abstraction of the main idea that binds all actions and decisions to achieve that vision. Concepts are expressed in narrative form with distinctive names or labels. Later, the concept chosen will direct all resources to achieve the vision that has been created. The concept chosen must be adapted to the village's potential, both natural and human resources and local wisdom. It is necessary to provide special characteristics and adjustments in the concept chosen by the village according to the knowledge of the local community, which will later encourage a village through developing a unique image of each village.

Prepare a future village development roadmap using a specific period (short, medium, long) that refers to the development vision. The village development vision needs to be detailed in regional development goals. Regional development objectives are also reduced to strategies, policy directions, main targets, indicators/programs, and activities in more detail. The vision also needs to be translated into targets. Goals are conditions that will be realized to achieve the vision. Good targets need to be equipped with indicators to measure each development goal's achievement. These indicators, equipped with achievement times, will then be arranged according to a specific period to form a village development roadmap.

Preparing a roadmap can be carried out through workshops inviting facilitators from relevant stakeholders to accompany the RPJMDes preparation team. Next, the results of the workshop were discussed and arranged according to short (3, 6, 12 months), medium (24 and 36 months), and long (48 and 60 months) time frames. The results of this process can be input into a systematic Village Development Program and demonstrate the village government's commitment to achieving the village development vision.

Village spatial planning is carried out by presenting programs in spatial allocation (spatial patterns and spatial structures) as maps as a guide for implementation in the field. Spatial pattern planning is allocating village space into zones that can be utilized (cultivation areas) and protected zones (protected areas). The spatial pattern plan also accommodates the conservative zone of natural resources that the village can own. In preparing a space pattern plan, it can be done according to the stages below:

1. Counseling/education regarding land spatial planning, namely Regency/City RTRW and marine spatial planning, namely RZWP2K, by relevant stakeholders.
2. Evaluate the spatial pattern by comparing the existing and spatial patterns in the applicable plan.
3. Determine space requirements for developing programs contained in the roadmap into a mental map of spatial pattern planning through participatory mapping (Section 2.1 Participatory Mapping).
4. Discuss and determine through village FGD the approval of the village spatial plan in the form of a spatial plan pattern.

Apart from that, space allocation that ensures the activities and life of the community needs to be carried out in the form of village spatial structure planning. The spatial structure plan includes plans related to activity nodes and networks that connect village nodes

(distribution and reach of village facilities and infrastructure). Preparing a village spatial structure plan can be done through the following stages:

1. Inventory of facilities and infrastructure owned by the village in accordance with the scale of service contained in SNI 03-1733-2004 concerning Procedures for planning housing environments in urban areas.
2. Evaluate the existing spatial structure using field observations with relevant stakeholders to pinpoint facilities and infrastructure in the village on the map.
3. Create a mental map and determine landmarks that become POIs (Points of Interest) or interesting objects owned by the village through participatory mapping.
4. Prepare projections for infrastructure development in accordance with the program contained in the future roadmap (what infrastructure you want to build, where (area and coordinate points), with what area).
5. Discuss and determine through village FGD the approval of the village spatial plan in the form of a planned spatial structure.

This spatial plan must consider and accommodate long-term vision, concepts, strategies, and policy directions. Another aspect that can be considered is the existence of natural resource reserves and the village's leading economic sectors. A spatial plan can become crucial in preserving the environment, avoiding conflicts regarding land and resource use activities, and controlling population growth. The results of this process become an attachment to the Village Program Plan as an integrated part of the development plan (RPJMDes), which contains locations (points, lines, and polygons) with specific coordinates for each village development program.

3.3. Challenges and opportunities applying InS-DeP model

In order to sustainably maintain the utilization of marine space for livelihood, the village community must spatially recognize the exact location for their current uses, i.e., fishery, mangrove, etc. Hence, they must draw their mental map to the technical map to inventory the village's livelihood assets. However, using a geographical information system (GIS) for mapping is rare for the village community, so an introduction to basic mapping is essential, particularly for village administrators (Figure 5). Community development programs should address this issue with training and assistance in conducting technical mapping.



Fig. 5. Discussion of marine space utilization plan for village development.

3.4. Challenges and opportunities applying InS-DeP model

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Village development programs that accommodate community activities that use marine space are oriented towards current use and future use. The community and village government urged to collaboratively plan village economic development programs by projecting their future needs. Coastal village livelihood, which mainly relies on marine resources, requires maintaining marine space for fisheries or other alternative livelihoods. Therefore, apart from existing marine space utilization, it is also necessary to identify the potential to develop alternative livelihoods for village communities.

Spatial planning at the village level is generally not legally accommodated in the current spatial planning system. However, the village administrator could suggest space utilization for the regional spatial plan (RTRW) or the detailed spatial plan (RDTR). Nonetheless, this scheme only occurred in spatial planning at the regency level, so there is a gap in spatial planning at the lower government levels, namely sub-districts and villages. Regulations regarding marine space utilization need to be continuously informed and discussed at the village level; thus, the community could reasonably understand their rights and limitations towards marine spatial use.

Marine spatial planning is currently contained in the Marine Spatial Plan (RTRL) at the national level and The Zoning and Small Islands Zoning Plan (RZWP3K) at the provincial level, so spatial use by villages on a scale is not visible on provincial maps. In addressing this gap, the village government can prepare a master plan as a consensus with the community, which can legally be ratified as a village head regulation. This master plan contains marine spaces that will be part of the village development plan (RPJMDes), clearly described as points, lines, and polygons on the map. This also requires assistance in conducting workshops to prepare a village master plan (Figure 3). This development planning, equipped with a spatial plan, can be implemented further by bringing it as an attachment to the application for facilitation of Suitability of Marine Space Utilization Activities Approval (PKKPRL), which can be carried out collectively in region-wide.

4 Conclusion

From a series of FGDs, spatial recognition towards the uses of marine space obtained through participatory mapping, the community could spatially locate their current uses of marine space. However, the community needs further training and assistance in conducting technical mapping. In terms of preparing marine space utilization plan, it is necessary to identify the potential to develop alternative livelihoods for village communities, beside the existing uses. InS-DeP model can be applied by the coastal village government to prepare more comprehensive village development plan (RPJMDes), which includes spatial uses of marine space. Hence, the coastal village could secure marine areas in front of their village to preserve the sustainability of natural marine ecosystems.

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