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Perception and Participation on Co-Management of Green Open Space in Coastal Reclamation Area Manado

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Abstract Reclamation on coastal area in Manado were functionally developed into Central Business Distric (CBD) BAM. The reclamation changed the coastal area includes reduce the accessibility to Green Open Space (GOS), decrease the sustainable GOS function, restrict the flexibility access of community to GOS and enclosed the GOS into private-domain public area. It lead to the disconnection of social interaction. This research was aimed to assess the correlation of community perception and participation toward activity of GOS in coastal reclamation area Manado. We used proportional random sampling by questionnaire. Total of a hundred respondents represent the government, businessman, and community in the converted land area. The results showed that there are influence of public perception and participation on shared management of GOS in the reclamation area. The higher public perception resulting higher public participation.

Keywords Community Participation, Community Perception, Green Open Space, Reclamation Area, Structural Equation Modelling

1. Introduction

One of important things in urban area is public open space which physically changed according to the community development. Public open space is accessed freely and applicable to everyone for their community activity. Public open space shaped as path (green line, lake's edge, riverbanks, railroad, and networks of electrical voltage) and city nodes (home garden, neighborhood and city parks, cemetery, etc) [1]. Public open spaces contribute in improving the quality of life and offer a healthier life for the community by providing the opportunities for physical and recreational activities. In other words, public open space enhances physical and psychological community welfare as well as facilitating the social integration of the user [2].

Generally, Green Open Space (GOS) is part of public open spaces in urban areas which filled by plants, crops and vegetation (endemic or introduced) [3]. The provision of this area is beneficial in the ecological, psychological, social-cultural and architectural aspects that provide economic benefits and human welfare [4]. Green open space offer the opportunity to build social interaction and contribute in enhancing the sense of place, thus increase the community's identity, solidarity, security and improve community comfort [5, 6].

Based on the structure, form and composition of GOS is an ecological landscape configuration, e.g. protected area, mountains, river, lake and coastal area [3]. Green open spaces in coastal area are useful to improve the water quality, prevent the flood, protect coastal area from abrasion, reduce the air pollutant, prevent the tsunami and reduce the air temperature.

Manado as a city in Indonesia located at coastal area. The city developed the center of human activities, both recreation or earns living. All of these activities influence the existing public space in coastal area; where the development of reclamation area indicate the lost of public space [7].

The reclamation of coastal area in Manado lead to the risk of abrasion, change the shorelines and threaten the safety of the community settlement. The reclamation also reduce the accessibility to GOS, decrease the sustainable GOS function, restrict the flexibility access to GOS and enclosed the GOS into private-domain public area.

It also implied on the degradation of GOS social function as an area in forming the social interaction. This activity is the main requirement for the occurrence of social activity and social reality. Generally, the social reality is based on individual motivation and its social actions [8]. Therefore, we assessed the correlation of GOS activity in coastal area of Manado towards community perception and participation in this reclamation area.

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2. Research Method

2.1. Study Site

This studies conducted in four District within the center of Manado, i.e. Wenang, Sario, Malayang and Tuminting. Manado is located in North Sulawesi, with total area of 157.26 km^2 (Fig. 1).

Source: Bappeda of Manado [9]

Figure 1. Research Site of Manado Coastal Area

The population of Manado city is dominated more by women than man, however both in the productive age. The education level of the labor is mostly high school graduates of 46.4%, and qualified diploma/bachelor by 17.8%. The most preference works are in the sectors of services by 78.9%, manufacturing by 16.6%, and agriculture by 4.5%.

2.2. Data Collection

Quantitative data sample was selected by proportional random sampling method using questionnaire. The sample size was adjusted to Structural Equation Modeling (SEM) [10]. This study used 100 respondents consisting of representatives from government, businessman and land conversion affected community.

2.3. Data Analysis

Data were analyzed descriptively by providing an overview and interpreting the tabulated primary data. The aim of this analysis was to obtain a description of each studied variables, e.g. level of perception and participation community on GOS co-management, the characteristics of frequencies and percentages of each variables, and general overview on the research object. Interpretation criteria for measuring the public perception were classified into five levels (Table 1).

Table 1. Classification of community perception

Score	Classification community perception
1.00-1.80	very low
1.81-2.60	low
2.61-3.40	medium
3.41-4.20	high
4.21-5.00	very high

We used seven indicators in measuring the level of community perception (Table 2) and participation (Table 3). Analysis followed by analyzing the correlation of perception and participation on GOS co-management in reclamation area of Manado using Structural Equation Modeling (SEM). This technique tested the multiple dependent variables and multiple independent variables simultaneously [10]. The steps of SEM data analysis [11] are as follows: 1) Preparation of path diagram; 2) Testing of each variable; and 3) Selection of input matrices and estimation models.

Table 2. Indicators of community perception

Indicator	Code
Knowledge of GOS concept	PS1
Willingness to provide time in managing the GOS	PS2
Other expectation on following GOS management	PS3
Other interest (profit) on following GOS management	PS4
Participated in other places' GOS management	PS5
Participated in GOS management to follow the trend	PS6
Willingness to provide time and effort in managing GOS	PS7

Table 3. Indicators of community participation

Indicator	Code
Respondent became a member in local forum in managing GOS	PR1
Respondents actively participate in planning GOS management	PR2
Respondents actively participate in voting or discussion for the fluency of GOS management	PR3
Respondents actively participate in GOS management, especially in plant handling	PR4
Respondents already getting the results of managing GOS	PR5
Respondents has been planting for GOS as recommended by government	PR6
Respondents monitoring the GOS management	PR7

The value of variables was used to determine the level of community participation in Manado referred to Arnstein typology [18]. The minimum and maximum scores determined the distance of the interval score in the Arnstein Ladder. According to Arnstein [18], there are eight levels of participation rate based on the strength of the community in influencing the plan. The overall community participation was also categorized in the typology of Arnstein (Table 4).

Table 4. Community participation level by Arnstein

Community participation level	Score
Citizen Control	384.82 – 432.00
Delegated Power	337.56 – 384.81
Partnership	290.30 – 337.55
Placation	243.04 – 290.29
Consultation	195.78 – 243.03
Informing	148.52 – 195.77
Therapy	101.26 – 148.51
Manipulation	54.00 – 101.25

3. Result and Discussion

3.1. Community Perception on GOS Co-Management

Level of community perception on GOS co-management in Manado reclamation area measured from seven indicators (Fig 2). Indicator with the highest average score was willingness to provide time for managing the GOS (PS2). Perception about GOS management was able to provide a positive impact for community surround reclamation area in Manado. These results were similar to Peters *et al*. [6] which reported public perception is not only stimulated by intense, formal and structured interaction among familiar person or group, but it also could be started from informal and casual interaction, e.g. brief chat. Through social inter-action, people feel greeted, connected with others and at the same time feel comfort. The main factors that establish the public perception about GOS is inclusive and accessible public open space to all community from various ethnic and socio-economic statuses.

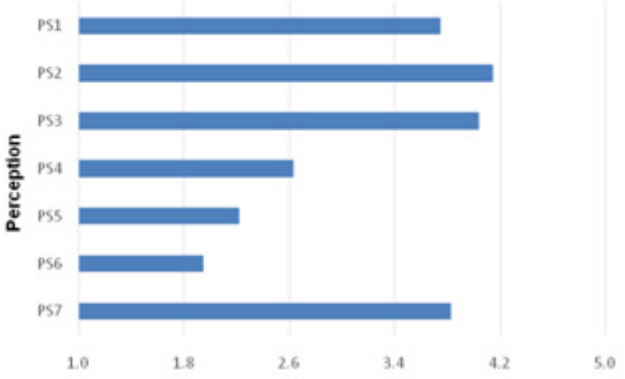


Figure 2. Community perception indicators on GOS Co-management

This research showed that public perception defined as a process of person or group in organizing and interpreting messages from their senses to obtain an understanding towards their environment. Arnberger and Eder [12] reported same study that involves 602 participants. The results showed that community solidarity could be perceived by messages or images interpretation about availability and quality of GOS and its recreational behavior within. Mechanisms that might be describe this relationship proposed by Lea *et al*. [13], reported that anonymity (as contained in visitations and activities in GOS) could raise self categorization that becomes one of social identity component. The next process would produce mutual attraction based on social identity and community interest in within the context of group alliance.

Level of public perception on GOS management in Manado reclamation area also accordance with the theory proposed by Halim [14]; perception is process of someone to obtain information from their environment. Perception is an active thing that requires a real encounter with an object, cognitive and affective processes. Perception helps indivi-duals to describe and explain their activities. Perception also explained as experience about an object, event or relation-ship obtained by inferring and interpreting information that involves sensation, attention, expectations, motivation and memory [15]. In this study, communities in Manado have willingness to provide time for learning more about GOS in reclamation area.

Related to the condition of the Manado community, public perception can be concluded as a series of community cognitive and affective processes (interests) toward an object and events obtained by concluding information and interpreting messages using the medium of senses. Perceptions that formed in this process were influenced by new information from the environment. It involves sensing process towards surrounding area and produces holistic and high constant physical form, which applies also to other places and objects [16].

3.2. Public Participation on GOS Co-Management

3.2.1. Indicators on Community Participation

The level of community participation also used seven indicators on GOS co-management in Manado coastal reclamation area (Fig. 3). The third indicator (PR3) has highest average score than other indicators. It means that Manado community already aware about the importance of participation on GOS management in Manado reclamation area. This awareness is encouraging community to be actively providing any advice, input and suggestion during discussion to create fluent implementation of GOS co-management.

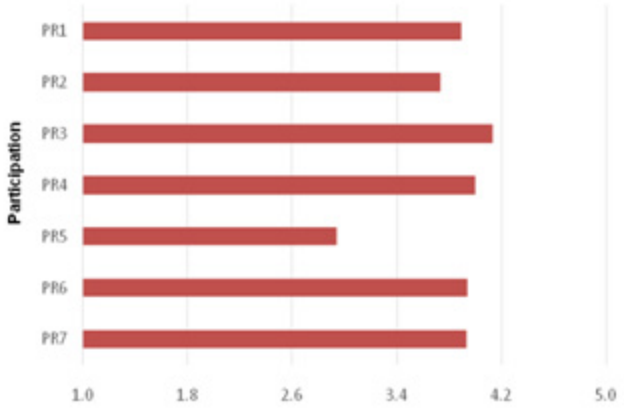


Figure 3. Community participation indicators on GOS Co-management

A case study in Jamaica explored the practice of participatory development based on joint aspiration among community and government. A successful participatory development requires external resources and communica-tion with the existing structural authority. Participation should be seen as a complement rather than an alternative for government and implemented with top-down approach. This type of participation is risked due to the possibility for government to use this participation as an excuse to avoid the shared-responsibility. Thus it is important for recog-nizing community complexity [17].

Empirical evidence from Gelcich *et al*. [19] showed that artisanal fishers have been empowered through the coastal co-management experience. However, their willingness to participate were mainly determined by their occupational mobility. Chilean artisanal fishers strongly support conservation of marine biodiversity in a bottom-up process besides the top-down steering and guidance.

3.2.2. Typology of Community Participation

The score level of community participation on GOS co-management in Manado reclamation area was 379. Thus, participation level of Manado community was included in *Delegated Power* category. It implies that government has been encouraging Manado community to actively participate in managing the GOS in Manado reclamation area.

This study showed that Manado community was optimally participating in GOS management program in reclamation area and absolutely incorporates in programs' planning and implementation. At this level, government gave authority to communities in providing dominant decision on a particular plan or program. The government should negotiate with the community and avoid any pressures in solving the problems within the management. However, the authority to make decisions and approved plans were legitimated by the government [20, 21].

Folke *et al.* [22] explained that the participation of politicians and governmental administrators seems to increase the integration of conservation and development; producing gratify outcomes.

Similar to governmental participation, stakeholder holds crucial role in maintaining the co-management. Sandström and Windmark [23] also found that co-management system in which the uneven power between stakeholders would be unsustainable. However, it is unclear how the consequences of the disparity might have for the viability and stability of the management system. It is proposed to use the consultation procedures as tools for co-managing, as conducted in the management of forest resources in Northern Sweden.

3.3. Correlation of Perception and Participation

3.3.1. Assumed Test of Structural Model

Linearity assumed by *Curve Fit* Test in SPSS software. We used parsimony principle, where the model considered linear if all of the model have significant or non-significant score. The variables of perception and participation in this study were assumed to have a linier correlation (Appendix 1) in the GOS co-management.

3.3.2. Model Suitability

Suitability evaluation of correlation model on perception and participation in this study were presented in path diagram. Results tests of *Overall Goodness of Fit* showed that CMIN/DF classified as recommended good model. Criteria of good model implies from the value of Chi Square/DF of ≤ 2.00. In this study, the value CMIN / DF has fulfilled cut-off value (Appendix 2). Therefore, the proposed SEM models in this research (Appendix 3) is suitable and feasible, thus possible to be interpreted for a further discussion.

3.4. Measurement Model of Perception and Participation

3.4.1. SEM Analysis

The SEM analysis showed that the third indicator (PS3) has the highest value of Standardize Coefficient (Table 5). This indicator informs that community has other expectations or interests for participation of GOS co-management.

The highest standardize coefficient obtained from the seventh indicator (PR7). It means that this indicator is the strongest indicator variable that determined the Community Participation (Table 6). Therefore, the main Public Participation (PR) was in the form of monitoring in GOS co-management.

Table 5. SEM Analysis of Community Perception Variable

Indicator	Standardize Coefficient	p-value
PS1	0.585	0.000
PS2	0.787	0.000
PS3	0.788	0.000
PS4	0.544	Fix
PS5	0.568	0.000
PS6	0.503	0.000
PS7	0.725	0.000

Table 6. SEM Analysis of Community Participation Variable

Indicator	Standardize Coefficient	P-value
PR1	0.663	Fix
PR2	0.622	0.000
PR3	0.682	0.000
PR4	0.649	0.000
PR5	0.598	0.000
PR6	0.681	0.000
PR7	0.699	0.000

3.4.2. Structural Model

Structural model measuring direct influence or correlations between community perceptions and partici-pation on GOS co-management. The positive structural model coefficient (0.731) indicates that community perception and participation had positive influence or uni-directional (Table 7). It implies the higher community perception (PS) resulting a higher community participation (PR) level and in reverse.

This result supported Taylor [24] opinion on a person's perception on an object could be true or false. In this study, the object of GOS co-management in Manado reclamation area was not be directly perceived by the community. Community tends to wait for stimulus from socialization or

training on this management program. Although these activities bring benefits to community, they felt to be forced (not their own willing). Whereas, a program will correctly runs if it is carried out voluntarily by community, without coercion [25]. Although most of them follow these activities, especially supported by the wages, then they are forced to participate in the management activity.

Table 9. Structural Model Direct Effect

Independent Variable	SEM Coefficient	p-value	Description
Community Perception (PS)→Community Participation (PR)	0.731	0.000	Significant

Initially, the community has a positive perception of the implementation. However, during the process, they showed medium or low participation. Some of them showed negative perception, but conversely showed a high partici-pation.

Development on the reclamation and revitalization of coastal area must also be integrated to the regional planning. It must generate additional value through cross-subsidies [26], especially for the surround coomunity.

Co-management should be adaptive to achieve conservation goals. It is not only to earn "conventional" conservation goals, but also enhance the effectiveness in reaching sustainable development goals. In this sense, conservation becomes part of development through adaptive co-management [22].

4. Conclusions

Community perceived the GOS co-management in Manado reclamation area positively and lead to high participation level on the managemnet. Manado communi-ties aware the importance of participation in GOS co-management, thus they actively provide suggestion during management. Community perception is positive linear related to the participation in GOS co-management. Public perception and participation influence on the shared management of GOS in the reclamation area. The higher public perception resulting higher public participation.

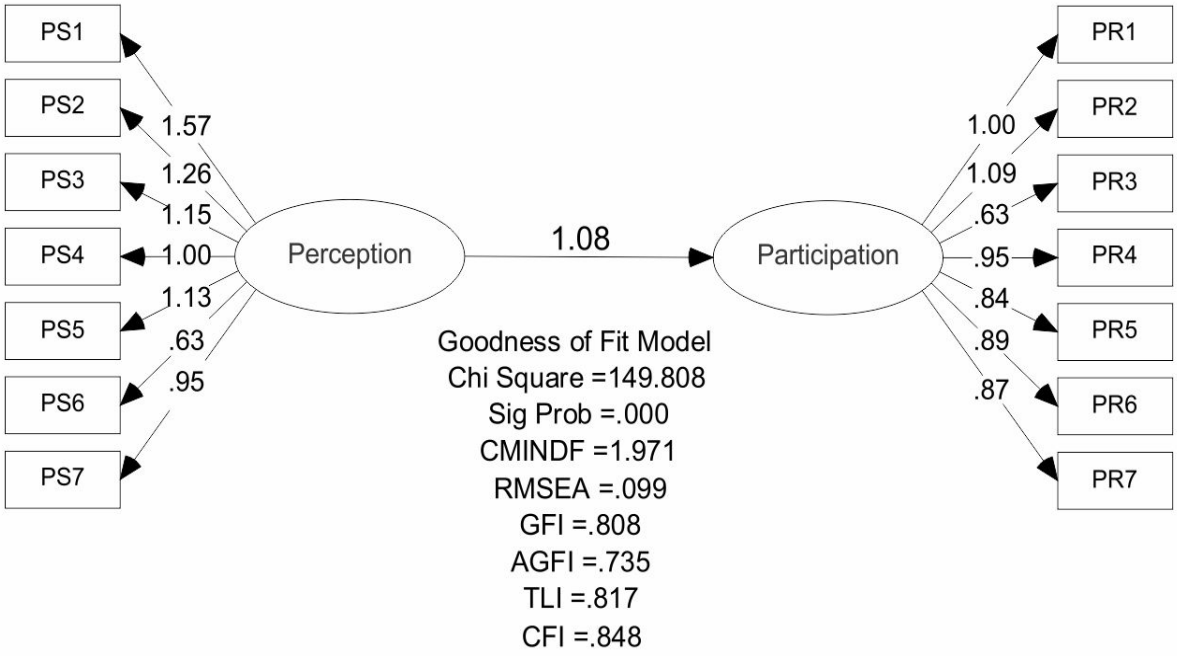
Appendix

Appendix 1. Linearity Assumption Test

Variables		Test Results	Decision
Community Perception (PS)	Community Participation (PR)	All model >0.05 (significant linier model)	Linier

Appendix 2. *Goodness of Fit* Overall Model

Criteria	Cut-off value	Result test	Description
Sig Prob	≥ 0.05	0.000	Marginal Model
Chi Square/DF	≤ 2.00	1.724	Good Model
RMSEA	≤ 0.08	0.086	Marginal Model
GFI	≥ 0.90	0.829	Marginal Model
AGFI	≥ 0.90	0.764	Marginal Model
TLI	≥ 0.95	0.872	Marginal Model
CFI	≥ 0.95	0.893	Marginal Model



Appendix 3. SEM Path Analysis of Correlation on Community Perception and Participation towards GOS Co-Management

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