

## **Analysis of Strategic Variables for Ecotourism Development; an Application of Micmac**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author NA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author AF managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.*

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### **ABSTRACT**

This study **aims** to determine strategic factors and its relationship in developing ecotourism areas. This research uses prospective structural approach. The analytical method uses Micmac to identify the most influential variables and its relation to Kedung Ombo ecotourism development. The **results** of analysis which realize the typology of strategic variables based on the strength of influence found 6 classifications of variable, namely: 1. The dominant variable consists of: regulation, and governance; 2. Key variable (Relay variable) consists of: institutional coordination, apparatus role, tourism marketing and tourism promotions. 3. Autonomous variable consists of: natural beauty, accessibility, potential of market tourism, local awareness of tourism. 4. The output variable consists of: funds for community, preservation of local wisdom, preservation of forest sustainability, conservation of reservoir function. 5. Regulators variable consists of: special permit policy for investment, retribution policy, tax policy, allowance policy, tourist attractions. 6. Secondary variable consists of: availability of tourism infrastructure, tourist interest of ecotourism, involvement of local community. The results of this study show a variety of information sources for policy makers in Kedung Ombo ecotourism development in a sustainable manner.

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## 1. INTRODUCTION

Tourism is one of sectors that are expected to become a new economic power in the future as availability of natural resources decreases. Tourism is considered as the fastest growing, environmentally friendly sector and has a high level of effectiveness in creating employment and high income. Based on this condition, developing a tourist destination requires comprehensive analysis about strategic variables related to the current situation and the future perspective to anticipate the uncertainties and unexpected future.

Tourism is a complex, systemic and evolutionary system. Tourism is also a socio-economic phenomenon that is spatially separated and bound by the attractiveness of local conditions. It is a phenomenon that requires high coordination and cooperation from all stakeholders [1]. So, to produce comprehensive scientific knowledge in the future, it cannot be judge tourism as merely sum of its constituent parts, as in traditional approach [2]. A tool is needed to take into account heterogeneous constituent elements, non-linear linkages, dynamic nature, and consider all the effects of changes in constituent elements, as well as being able to describe future situations. To achieve this goal, prospective analysis is needed.

One potential area that can become a tourist attraction is reservoir area. Utilizing reservoir area and its resource for tourism was a rational thing. This matter had been quite successful in several cases in China and other countries [3]. This research recommended that development of tourism around reservoir could be done as long as it could realize a harmonization between human, nature, social and economic development in a sustainable manner. This is to ensure that the important task of the reservoir must be maintained well, such as: flood storage and disposal, water volume adjustment, electricity generation, water supply for industry and agriculture and life in the city. If tourism arrangement in this area was not appropriate, the serious consequences would not be measurable anymore. Therefore, it was necessary to have an appropriate planning supported by a future comprehensive analysis in order to realize a sustainable tourism.

In Indonesia, Kedung Ombo Reservoir is one of the largest dams in Southeast Asia, with an

inundation area of  $\pm 4,500$  acre with volume of 723 million cubic, the reservoir area has a natural beauty. However, this dam has experienced massive siltation (an average of 0.87 cubic per year) since 2003 due to significant sedimentation. The sedimentation occurs as a result of conversion of land around the dam and other economic activities of local residents in the dam. This will disrupt the sustainability of the main function of the dam. Therefore, it is necessary to look for an alternative activity that can provide economic benefits but safe for the sustainability of the reservoir function. For these reason, we alternatively propose a developing ecotourism area in the dam surrounding area.

Since officially announced in 1989, the development of Kedung Ombo area as a real tourist destination has begun, but it has not succeeded yet until now. The main obstacle that can be identified is a number of parties involved in management but not accompanied by strong coordination and cooperation, each party tends to maintain its own interests. This is contrary to the statement that tourism is a phenomenon that requires high coordination and cooperation from all stakeholders [4]. Tourism is a heterogeneous form of relationship between stakeholders that forms a hybrid network having benefits for all members [5]. The success of ecotourism development is determined by several dimensions, like; the existence of product driven constraints, market understanding (market driven), institutional factors, and policy support [6]. Therefore, this reserch was conducted to provide input for decision makers about strategic variable conserning on developing Kedung Ombo ecotourism. The results of the study allow of arrangement of quality long-term policy recommendations, avoiding of problems and encouraging for future thinking.

## 2. THEORITICAL BACKGROUND

### 2.1 Ecotourism Concept

Ecotourism is a term that is often debated. Sometimes, this term is used to describe tourism activities that focus on natural observation, but it is often called natural tourism in other perspectives. Meanwhile, the original term ecotourism is interpreted as a proactive approach to mitigating negative influences and increasing positive influence on natural tourism. This is caused by a different perspective [6].

Some experts convey their perspectives from the aspect of travel to natural areas, while others emphasize on the form of tourism.

There are at least three notions of ecotourism which are formulated in the context of trips to natural areas as summarized by Drumm and Moore (2005: 15) and Wood (2002: 9) [6], namely: 1) ecotourism is a trip that is responsible for natural areas to preserve environment and improve welfare of the local community (The International Ecotourism Society, 1990), 2) ecotourism is a trip to a vulnerable, untouched and protected area but has a small scale impact. Ecotourism educates tourists to provide funds for conservation, direct benefits for economic development and empowering local communities, and having priority respect for cultural differences and human rights (Martha Honey, 1999), 3) ecotourism is a journey of being environmentally responsible and visits to natural areas, in order to enjoy and appreciate nature (as well as all past and present cultural traits) to promote conservation, have little impact and actively encourage socio-economic involvement of local communities as beneficiaries "(IUCN, 1996) [6]. As a form of tourism, ecotourism is defined as a form of nature-based tourism that seeks to preserve it ecologically, socio-culturally and economically by providing opportunities for appreciation and learning about the natural environment or other specific elements (Weaver 2001: 105) [6]. However, ecotourism is generally defined as a form of nature-based tourism that seeks to preserve ecologically, socio-culturally and economically by providing opportunities for appreciation and learning about the natural environment or other specific elements [6]. The failure of ecotourism development can be seen in the context of the tourism system itself, namely the existence of product driven constraints, lack of market understanding, many institutional constraints, and lack of policy support [6]. In this study, these four dimensions are used to determine strategic variables in the development of the Kedung Ombo ecotourism area.

## 2.2 Prospective Structural Approach

Prospective structural analysis is a method that is based on the development of future scenario based on the historical trends of a system. Prospective structural analysis is a robust method to identify key variables (driver domain) and study the relationship between dependent and independent variables of a system [2,7]. The main purpose of this method is to reduce future

uncertainties, build possible or desired scenarios and encourage the action needed to achieve them. Prospective analysis will be able to capture the existence of complex strategic factors and its independent relationships, which is needed to realize a long-term quality.

Prospective analysis techniques assume that the future is different from the past and not forced, but can be built. Prospective structural analysis techniques will analyze the complexity of the elements, factors and its relationship and understand the key variables of system in the current and future situations. The relationship between these variables is a rich source of information that will determine thinking about some problems in this future context (Guzmán, Malaver, and Rivera, 2009) in [8]. Through structural analysis, many variable functions will be identified so that makes it easier for decision makers to determine the right policies.

Prospective structural analysis is carried out by a work committee consisting of actors and experts from the field under study without excluding external advisors [9]. Structural analysis has distinctive advantages from other analyzes in such factors, like: allowing expert groups to find methods for sharing ideas among group members, giving group members the opportunity to explain views and thoughts about certain problems [8]. Structural analysis method was very useful as a decision making support, operational planning, impact determining strategy and the future alternative evaluation and it was operated in a matrix form. The structural analysis was structured in three stages.

Structural analysis was initially philosophical and qualitative, but later, changed and operationalized into a variety of quantitative methods [10]. Through structural analysis, many variable functions will be identified so that makes it easier for decision makers to determine the right policies. Structural analysis method was very useful as a decision making support, operational planning, impact determining strategy and the future alternative evaluation and it was operated in a matrix form.

## 3. RESEARCH METHOD

### 3.1 Research Design

This research was designed based on a prospective structural paradigm in the context of future thinking.

### 3.2 Data Collection

Data collection method was carried out focus on group discussion and workshop, that needed in prospective structural analysis. The discussions were held using world café method, which will drive knowledge sharing and experience transfer processes among participants. The focus of group discussions was aimed to identify and determine strategic variables in development Kedung Ombo ecotourism area. The scope of strategic variables in ecotourism systems is very broad. In this study, the strategic variables of ecotourism are: product driven, market driven, institutional and public policy support [6].

Participants who involve in a group discussion represented stakeholders of Kedung Ombo dam, that was Operational Director of Balai Besar Wilayah Sungai (BBWS) Pemali Juana, Regional Development Planning Agency officials, Head of Sports and Tourism Youth Services Department from Grobogan, Boyolali and Sragen District, lecturers of Solo Sahid Tourism College, students, tourism service business and community around reservoir. Before that, some interviews were held with Head of Balai Besar Wilayah Sungai (BBWS) Pemali Juana, Administrator of Perhutani Public Company, Head of Geyer- nearest village of the reservoir, community around reservoir and visitor the reservoir, to explore the possibility of development Kedung Ombo ecotourism idea and all participants stated agree with this idea.

### 3.3 Data Analysis

Data analysis was carried out based on the concept of prospective structural analysis using Micmac method. Micmac is a software compiled to perfect prospective structural analysis such as AHP (Analytical Hierarchy Process) and ISM (Interpretive Structural Modeling). Micmac method was developed by the Institute d'Innovation Informatique pour l'Etreprise in 1986, under the supervision of the Laboratory of Investigation in Prospective Start and Organization (LIPSOR) (Godet, 1999 in [8]; [9]. This software has changed future strategic analysis through a variety of quantitative methods which previously almost all future analyzes were qualitative [10]. According to Jimenez, 2009 [8], Micmac allows to analyze qualitative variables and explores diverse and uncertain futures.

Micmac aims to identify and analyze the main variables of a system, relationships and

hierarchies based on stakeholders' perception. Application of Micmac method consists of 3 stages, namely: define problems, identify internal and external variables, and analyze relationships between variables system. The first and two stages were carried out during the workshop while the third carried out by operating the Micmac software. Relationship level of mobility variables was assessed by scale: 0 = none relationship, 1 = weak, 2 = moderate, 3 = strong, P = potential.

The results of this qualification will identify variable relationship into 3 classifications: direct influence, indirect influence, and potential influence. Direct influence occurs if variable A has an effect on variable B. Indirect effects occur if variable A affects variable B and variable B affects variable C. With the transitivity process, C is indirectly influenced by A. Potential effects occur if the influence of variable A is against to B. If there is no direct influence from one variable on another variable, it is called no influence (Portillo and Ortega, 2004). This comparison between the classification of direct and indirect influences confirms the importance of certain variables and reveals that these variables may have long-term effects. Mobility and dependency between variables analysis was determined the location of variable indicators at Input-Output Quadrant (Fig. 1).

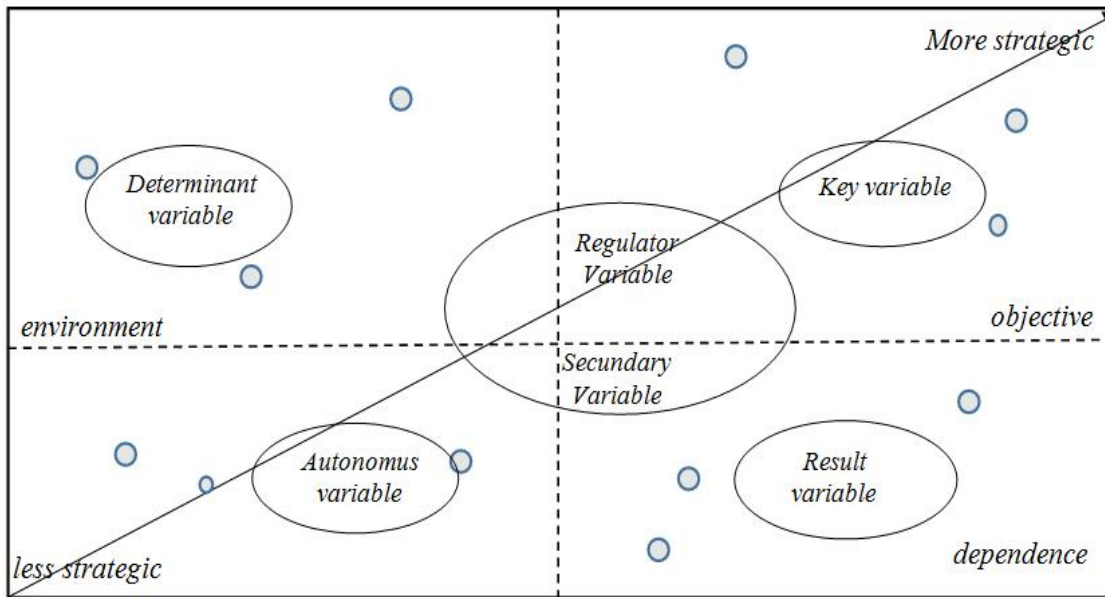
## 5. RESULT AND DISCUSSION

Focus group discussion (FGD) has identified factors that are considered as strategic variables of development of Kedung Ombo ecotourism. These variables are grouped into categories according to dimensions in the context of ecotourism (Table 1).

The next step is to identify type of each variable seen from intensity of its strength in influencing other variables or depending on other variables through visualization of interrelation graph (Fig. 1). Identification is done by considering data of previous changes, characterizing the current situation and identifying upcoming trends. At this stage, all participants of FGD agree to fill out the data in the Direct Influence Matrix (MDI), with the following scale: 0 = no influence, 1 = weak influence, 2 = moderate influence, 3 = strong influence and P = potential influence. MDI will provide an overview about position of group variables related to intensity of variables influence on other variables. From this mapping, it will be known several variables that have a

strong direct influence on other variables and there are several variables that have a little. This mapping also shows that variable actions will have an impact on other variables and also

as feedback on these variables. The results of the analysis of the MDI matrix obtained a typology map of the direct influenced variables in Fig. 2.



**Fig. 1. Variable classification based on input-output and strategic logic**

Source: Godet (2001) in Delgado, et al. (2015), Zali, et al. (2015)

**Table 1. List strategic variable of development Kedung Ombo Ecotourism**

No.	Variable	Short label	Dimension	No	Variable	Short Label	Dimension
1	Natural Beauty	NB	Product Driven	12	Funds for Community	FC	Policy
2	Local Awareness of Tourism	LA	Product Driven	13	Allowance Policy	AC	Policy
3	Involvement of Local Community	ILC	Product Driven	14	Preservation of Forest Sustainability	FS	Policy
4	Accesibility	AC	Market Driven	15	Concervation of Reservoir Function	RF	Policy
5	Availability of Tourism Infrastructure	AI	Market Driven	16	Tax Policy	TP	Policy
6	Potential of Tourism Market	PTM	Market Driven	17	Special Permit Policy for Investment	SPI	Policy
7	Tourism Attraction	TA	Market Driven	18	Preservation of Local Wisdom	LW	Policy
8	Tourist Interest of Ecotourism	TI	Market Driven	19	Governance	Gov	Institutional
9	Tourism Promotion	TP	Market Driven	20	Regulation	Reg	Institutional
10	Tourism Marketing	TTM	Market Driven	21	Institutional Coordination	IC	Institutional
11	Retribution Policy	RP	Policy	22	Apparatus Role	AR	Institutional

Source: Focus Group Discussion (2018)

Based on Fig. 2, typology of strategic variable in Kedung Ombo ecotourism development can be grouped into the six qualifications as follow:

1. Input variable (Dominant variable) consist of: regulation, and governance.
2. Key variable (Relay variable) consist of: institutional coordination, apparatus role, tourism marketing and promotions.
3. Autonomous variable consist of: natural beauty, accessibility, potential of tourism market, local awareness of tourism.
4. Output variable consist of: funds for community, preservation of local wisdom, preservation of forest sustainability, conservation of reservoir function.
5. Regulator variable consist of: special permit policy for investment, retribution policy, tax policy, allowance policy, tourist attractions.
6. Secondary variable consist of: availability of tourism infrastructure, tourist interest of ecotourism, involvement of local community.

Furthermore, we can see the intensity of the variable influence from the strongest to the weakest. Intensity of the influence of variables is indicated by the color of e connecting line intervariable, namely: 1) red line indicated that influence was very strong; 2) thick blue line indicated that influence was relatively strong; 3) thin blue line indicated that the influence was moderate; 4) black line indicated that the influence was weak; and 5) dashed line indicated that influence was very weak. (Fig. 3 in percentage 10%). Information of the direct influence variable qualification is very important for policy makers. The result of this analysis could be a direction for the decision makers to focus on variables having the strongest influence, because these variables will determine directly to the behavior of other variables. Based on Fig. 3, we know that tourism promotion, governance, regulation, institutional coordination, as the strongest variable influenced preservation of local wisdom as one of the goals of ecotourism. The intensity of the influence to other variables as a whole can be seen in Direct Influence Graph with a percentage of 100% at Micmac Software.

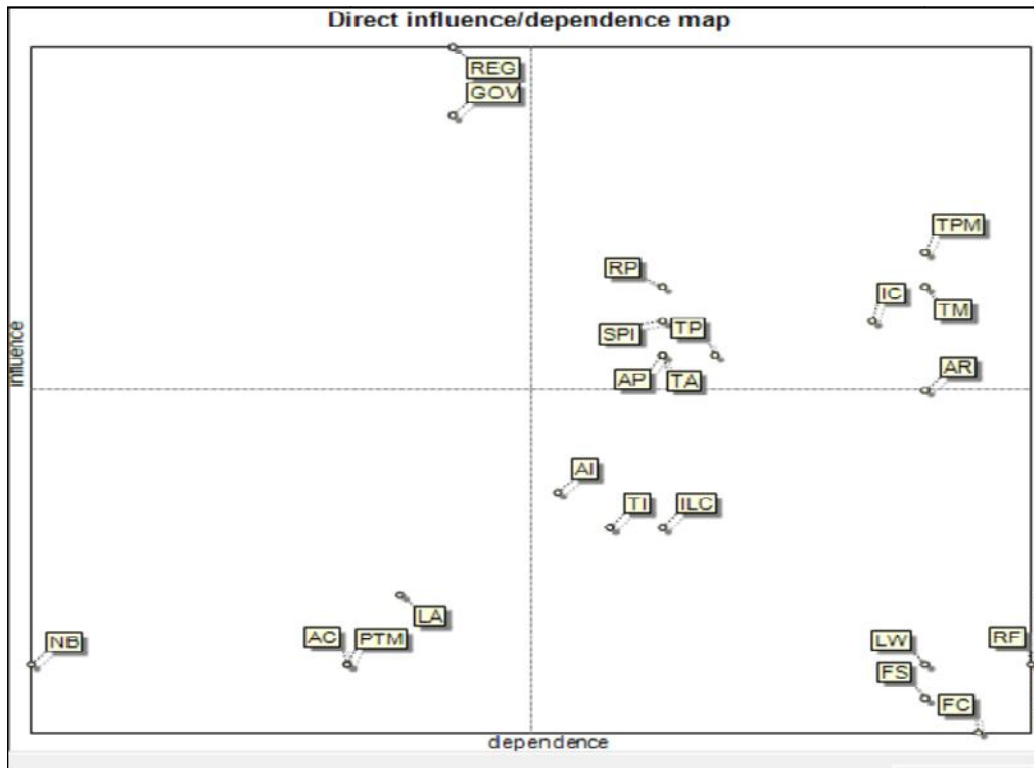
To test stability, results of variables classification based on direct influence, re-identification is carried out based on indirect influences. The process of analyzing indirect effects is further

explained in the matrix MII (Matrix of Indirect Inflation). Results of indirect effects analysis will show more satisfying stability in terms of qualifying variables. Output of indirect classification model will confirm of system stability. If there are many changes in the position of the variable from the map of direct influence, then the system has a low stability. The results of indirect effect analysis indicate that there is no change in the position of the variable from the direct effect classification (Fig. 4). These results indicate that the system and the typology of variables that have been classified in the direct effect are stable.

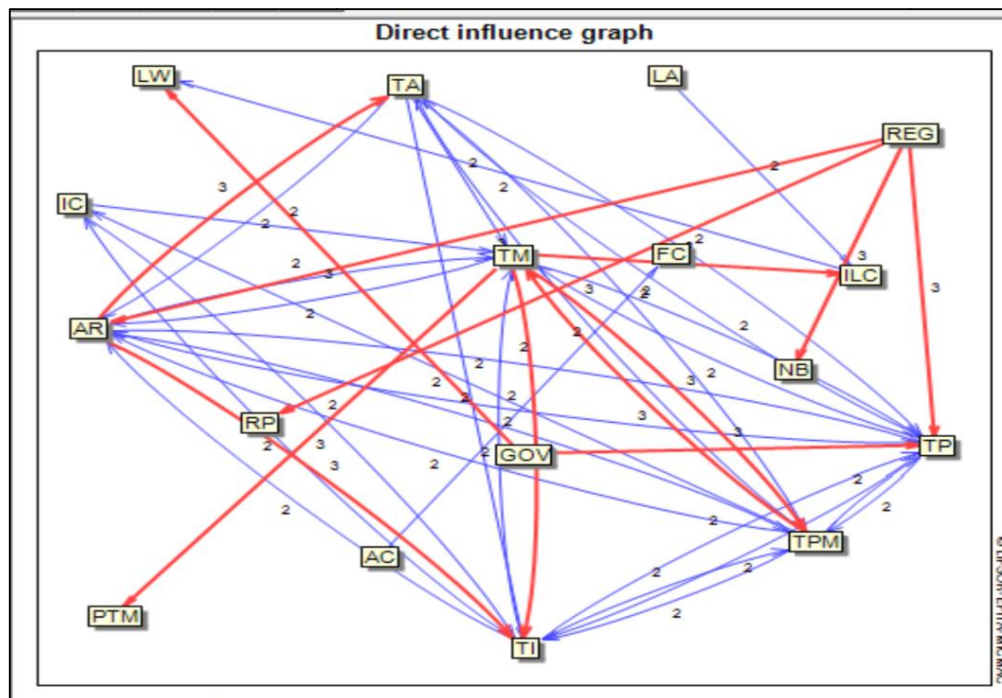
However, viewed from the intensity of its influence, the classification of variables based on indirect influences experience significant changes. This can be seen from the colour change of the line that connects to the variable (Fig. 5). From Fig. 5, it can be seen that compared to the direct influence, the analysis of indirect effects is obtained by more variables which have very strong influence, while in the direct influence analysis, there are more variables which have a relative strong influence.

Furthermore, the MicMac method provides an analysis of potential direct influences that illustrate the possibility of variable classification changes if certain actions are taken on the system, which is called aspotential influence. Results of potential influences analysis are explained in the Direct Effect Potential Matrix (MPDI) in Fig. 6. Based on Fig. 6, it can be seen that there is no change in position of the direct variable influence (Matrix of Direct Influence-MDI) or Matrix of Indirect Influence (MII). Base on this analysis it can be said that the grouping of variables based on direct influence is stable.

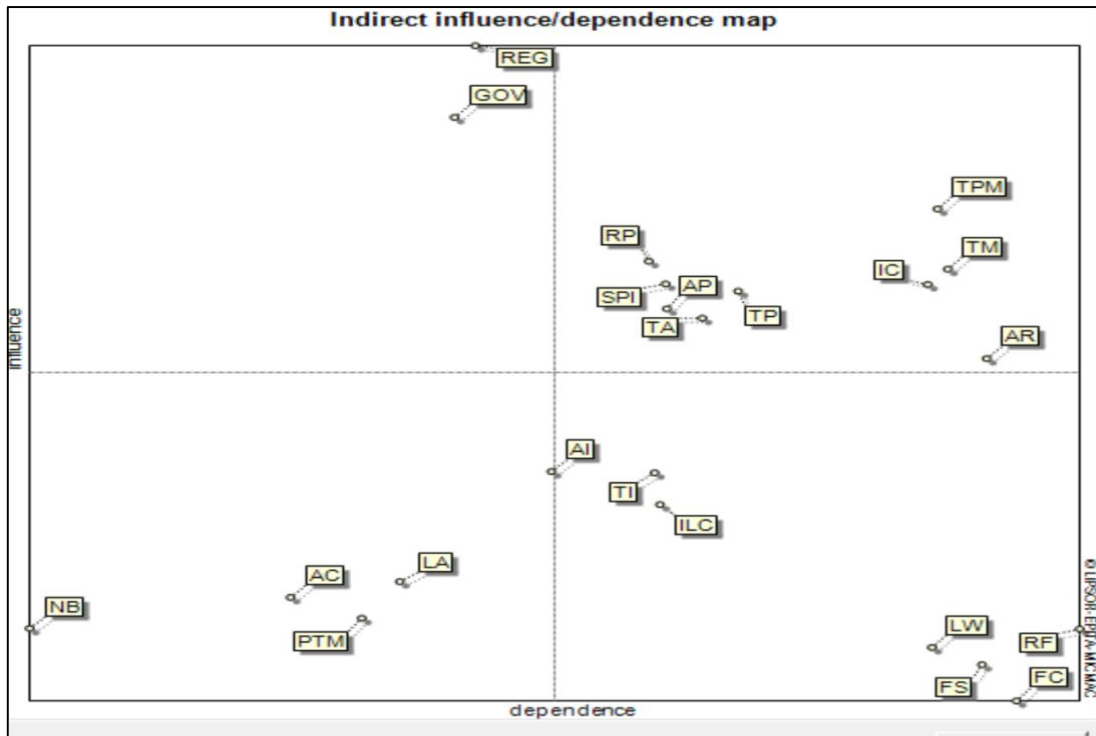
As found in the classification of direct effects, Micmac analysis also provides a potential analysis of the effects of indirect variables, which referred to the Indirect Influence Potential Matrix (MPII). The results of the MPII analysis are presented in Fig. 7. From Fig. 7, it can be seen that there is no change position variable from the previous analysis, so that it can be said that the variable classification in the six types of Matrix Direct Influence (MDI), Matrix Indirect Influence (MII) or Matrix Potential Influence Analysis (MPDI) are stable. So, it can be used as a conclusion of strategic variables in the development of Kedung Ombo ecotourism area.



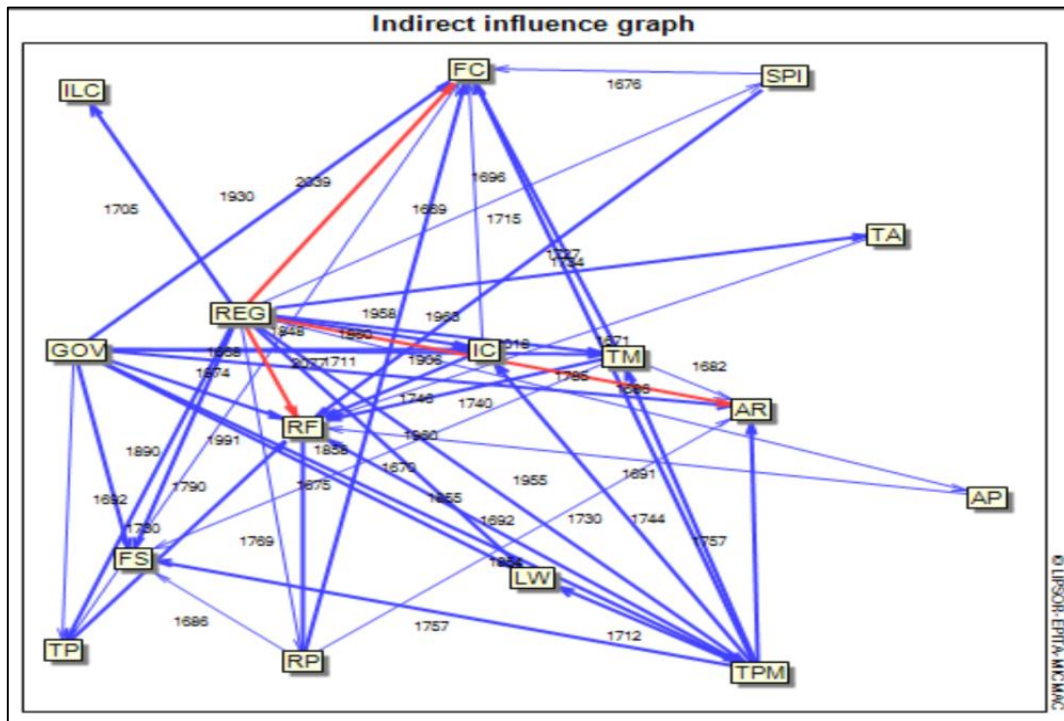
**Fig. 2. Map of direct influence (MDI)**  
 Source: *Strategis Variables Analysis based on Mimax (2018)*



**Fig. 3. Intensity of direct influence variable**  
 Source: *Strategis Variables Analysis based on Mimax (2018)*



**Fig. 4. Map of indirect influence (MII)**  
 Source: Strategis Variables Analysis based on Mimax (2018)

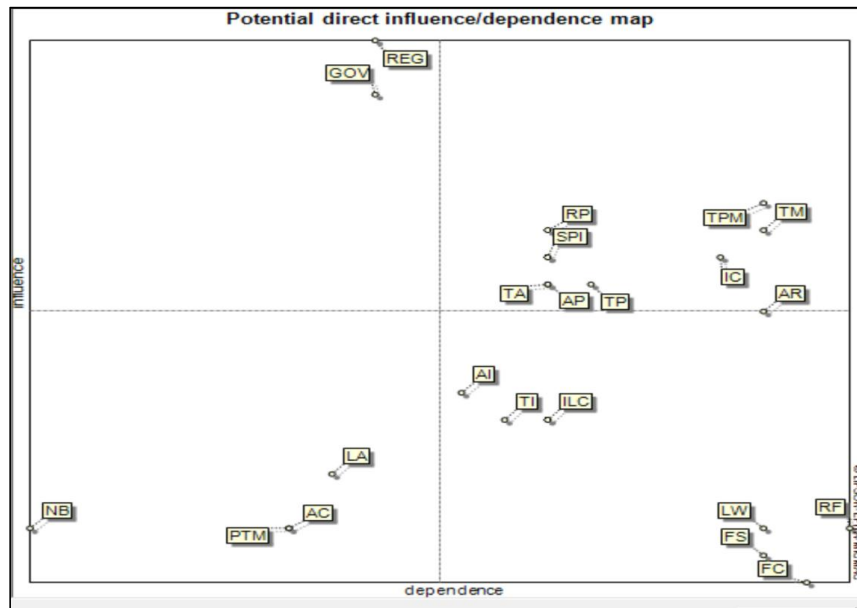


**Fig. 5. Intensity of indirect influence variable**  
 Source: Strategis Variables Analysis based on Mimax (2018)



From the various carried out analysis, the overall results show that the variable grouping in the development of ecotourism area at Kedung Ombo Dam built in this study is stable. This is indicated by the absence of significant changes in typology of variables from the initial analysis, which is based on direct influence, as well as indirect effects to potential direct effects and potential indirect effects, not significantly changing. Based on these findings, we can finally find out the level of influence variables in development Kedung Ombo ecotourism as

shown in Tabel 2. This finding is very helpful for policy makers to develop Kedung Ombo ecotourism area in determining the priority scale of which variables should be added in its development rather than other variables. Variables that have a top level must be prioritized gradually before the other variables which are in the next ranked. Based on Table 2, the variable that must be prioritized in the development of Kedung Ombo ecotourism area is that governance and new regulations continue to focus on other variables.

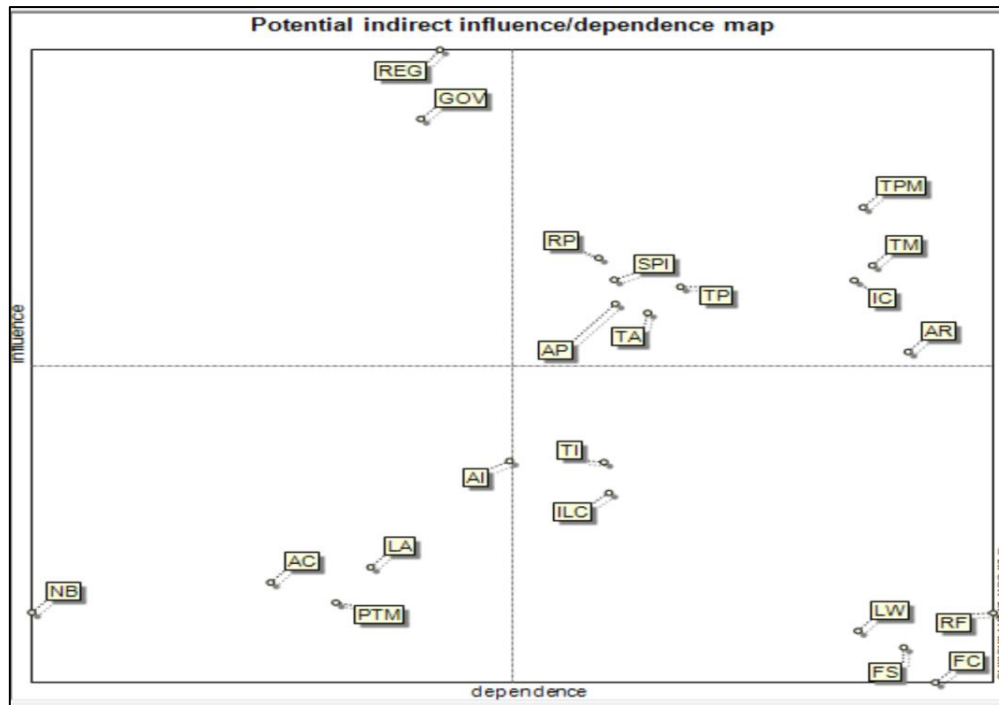


**Fig. 6. Map of potential direct influence (MPDI)**  
 Source: Strategis Variables Analysis based on Mimax (2018)

**Table 2. Level of influence variables**

Ranking	Variable	Ranking	Variable
1	12 - Government (Gov)	12	4 - Availability of Tourism Infrastructure (AI)
2	13 - Regulation (Reg)	13	2 - Involvement of Local Community (ILC)
3	22 - Tourism Promotion (TPM)	14	21 - Tourist Interest of Ecotourism (TI)
4	6 - Retribution Policy (RP)	15	5 - Local Awareness of Tourism (LA)
5	20 - Tourist Marketing (TM)	16	1 - Natural Beauty (NB)
6	8 - Special Permit Policy for Investment (SPI)	17	3 - Potential of Tourism Market (PTM)
7	16 - Institutional Coordination (IC)	18	11 - Conservation of Reservoir Function (RF)
8	9 - Allowance Policy (AP)	19	14 - Accesibility (AC)
9	18 - Tax Policy (TP)	20	15 - Preservation of Local Wisdom (LW)
10	19 - TaxAllowance (TA)	21	10 - Preservation of Forest Sustainability (FS)
11	17 - Aparatus Role (AR)	22	7 - Funds for Community (FC)

Source: Strategis Variables Analysis based on Mimax (2018)



**Fig. 7. Map of potential indirect influence (MPII)**  
 Source: *Strategis Variables Analysis based on Mimac (2018)*

## 6. CONCLUSION AND SUGGESTION

### 6.1 Conclusion

This study has succeeded in identifying 22 variables which are considered by stakeholders as the most important variable in the development of Kedung Ombo ecotourism area. These variables are spread in four dimensions, namely: supply (product driven), market driven, institutional and public policy support. This finding confirms the statement at the previous study that tourism is a complex system that must be analyzed based on a multidimensional approach and considering its dynamics.

The results of the Micmac analysis of the strategic variables typology based on strength of influence found 6 classifications of variables, namely: 1. The dominant variable consists of: regulation, and governance; 2. Key variable (Relay variable) consists of: institutional coordination, apparatus role, tourism marketing and tourism promotions. 3. Autonomous variable consists of: natural beauty, accessibility, potential of market tourism, local awareness of tourism. 4. The output variable consists of: funds for community, preservation of local wisdom, preservation of forest sustainability, conservation

of reservoir function. 5. Regulators variable consists of: special permit policy for investment, retribution policy, tax policy, allowance policy, tourist attractions. 6. Secondary variable consists of: availability of tourism infrastructure, tourist interest of ecotourism, involvement of local community. This qualification has been tested using the Independent Matrix and Matrix. The potential consistency test for this qualification has also been tested and the results are stable.

Among the 6 typologies of these variables, the dominant variables and relay variables must get greater attention from policy makers than other variables. The dominant variable is the variable that has a very high influence with low dependency, while the relay variable also called the betting factor is a variable that has a high influence and high dependency. This variable will not only provide a boomerang effect but also can be an indication of a potential system breakpoint.

In this study, the dominant variable is regulation and governance. The results of the study indicate that institutional variables are variables that must receive priority scale for decision makers in the development of Kedung Ombo ecotourism area. Whereas, the variables include: institutional coordination, apparatus roles, tourism marketing

and tourism promotions. These findings are suitable with the statement on the background that governance, regulation and coordination are very important factors in the development of projects involving many parties such as tourism. The marketing, promotion and attraction variables representing the marketing driven dimension are also very precise as variable relay, to encourage the development of market orientations that are generally weak in the types of natural tourism.

Other findings from this study are the level of influence variables in development Kedung Ombo ecotourism. This finding is very helpful for policy makers on the development of the Kedung Ombo ecotourism area in determining the priority scale of which variables should be added in its development rather than other variables. Variables that have a top rank must be prioritized before proceeding to other variables which are in the next rank. Based on Table 2, the variable that must be prioritized in the development of the Kedung Ombo ecotourism area is that governance and new regulations continue to focus on other variables.

These findings have implications for policy makers in developing the Kedung Ombo ecotourism region that they must seriously supervise relay variables and direct all managerial efforts to these variables towards the evolutionary path as desired. At the same time, policy makers must also be aware of the relative shortcoming of the current relay variable which is one of the problems must be resolved to achieve the desired results. Based on the results of the qualifications of the variables found in this study, especially in relay variables, the potential of ecotourism in the Kedung Ombo Reservoir can still be optimized without having to worry about disturbing the function of the dam.

This finding is a very strong foundation for all parties involved in policy making to realize a sustainable Kedung Ombo ecotourism area. By understanding the results of this study, all the main stakeholders of the Kedung Ombo reservoir can be involved in the decision making process through the appropriate governance system by economic policies, social policies, land use policies, reservoir conservation policies and a balanced environment. Finally, we state that the method used in this study is a new way in building a systematic analysis of variables role to determine system stability. The application of prospective structural analysis with the Micmac method in the decision-making process that

considers the position and intensity of the influence of variables in the form of direct or indirect influence (and no causal relationship) has clarified the validity and strength of the approach in determining the most desired variable involved in development of Kedung Ombo reservoir ecotourism area as expected in the future.

## 6.2 Suggestion

1. To guarantee the development of the ecotourism area in Kedung Ombo will run successfully and sustainable, the policy makers must seriously control the dominant and the relay variables and direct all managerial effort toward the desire result.
2. The development policy of Kedung Ombo ecotourism based on the finding of this study will produce benefits in preservation of forest sustainability, conservation of reservoir functions, availability of funds for community and preservation of local wisdom.
3. All of the main stakeholders of the Kedung Ombo reservoir can be involved in the decision making process through the appropriate governance system which supports economic policies, social policies, land use policies, and environmental policies.
4. For further research, we recommend to continue the use of the application test of structural analysis methods, especially when it is difficult to obtain published statistical information.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Vystouopil Jiri, Sauer MRO. Quantitative analysis of tourism potential in the czech republic. *Acta Univ Agric Silvic Mendelianae Brun.* 2017;65(3):1085–98.
2. Delgado-Serrano M del M, Ambrosio-Albalá M, Amador F. Exploration de l'analyse structurale prospective pour évaluer l'importance du développement rural territorial en Espagne et Nicaragua. *Cuad Desarro Rural.* 2015;12(76):35–56.
3. Qin Z. Reseaonable development of tourism resources of reservoir. *Res Found Zhejiang Water Resour Dep Zhejiang Water Conserv Hydropower Coll* (No xky-201005), PRChina [Internet]. 2011;1–2.

- Available: <https://ieeexplore.ieee.org/document/5893391> -
4. Hermans LM, Thissen W. Actor analysis methods and their use for public policy analysts. Eur J Oper Res [Internet]; 2009. Available from: [https://www.researchgate.net/.../223408712\\_Actor\\_analysis\\_](https://www.researchgate.net/.../223408712_Actor_analysis_)
  5. Johannesson GT. Tourism translations: Actor-network theory and tourism research. Tour Stud [Internet]; 2005. Available: [https://www.researchgate.net/publication/249631333\\_Tourism\\_translations\\_Actor-Network\\_Theory\\_and\\_tourism\\_research](https://www.researchgate.net/publication/249631333_Tourism_translations_Actor-Network_Theory_and_tourism_research)
  6. Asmin F, Layout D, Asmin F, Dan E, Berkelanjutan P, Dari D, et al. Ekowisata dan pembangunan berkelanjutan: Dimulai dari konsep sederhana [Internet]; 2017. Available: [https://www.academia.edu/36181512/Buku\\_Ekowisata\\_dan\\_Pembangunan\\_Berkelanjutan\\_Dimulai\\_dari\\_Konsep\\_Sederhana](https://www.academia.edu/36181512/Buku_Ekowisata_dan_Pembangunan_Berkelanjutan_Dimulai_dari_Konsep_Sederhana)
  7. Godet M. The art of scenarios and strategic planning. Technol Forecast Soc Change [Internet]. 2000;65(1):3–22. Available: <http://linkinghub.elsevier.com/retrieve/pii/S0040162599001201>
  8. Arias MLB. Structural analysis of strategic variables through micmac use: Case study. Miditerraen J Soc Sci. 2016; 7.
  9. Omran A. Structural analysis with knowledge-based MICMAC approach; 2014.
  10. Go A, Fernandez GS. Foresight analysis of agricultural sector at regional level. Future. 2009;41(2009):313–24.

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