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### The Application of Etnomethodology Based on Sustainable Development to Know The Environmental Quality in Halim Perdanakusuma Airport

<sup>1</sup>Sungkono, <sup>2</sup>Sukoharsono Ekoganis, <sup>3</sup>Bisri Mohammad, <sup>4</sup>Djakfar Lutfi

<sup>1</sup>PhD Student, Doctoral Program of Environmental Studies, Graduate School, University of Brawijaya, Mayjen Haryono No. 169, 65145 Malang, Indonesia

<sup>2</sup>Professor, Faculty of Economy, University of Brawijaya, Veteran Malang, 65145 Malang, Indonesia

<sup>3</sup>Professor, Faculty of Engineering, University of Brawijaya, Veteran Malang, 65145 Malang, Indonesia,

<sup>4</sup>Lecturer, Faculty of Civil Engineering, University of Brawijaya, Veteran Malang, 65145 Malang, Indonesia

#### Address For Correspondence:

Sungkono, University of Brawijaya, Doctoral Program of Environmental Studies, Graduate School, Mayjen Haryono 169, 65145 Malang, Indonesia.

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#### ABSTRACT

**Background:** Good environmental conditions are needed to support sustainable development in order to maintaining ecological processes, the availability of sufficient resources, social, economic, and environment as appropriate (Soemarwoto, 2001). In the present, a lot of bad effects in the airport because of weak management. One of bad effect is polluted air and water. **Objective:** This paper will explain about the operational of enclave civil airport based on sustainable development from environment aspect in Halim Perdanakusuma airport. **Method:** This study use qualitative method by etnomethodological application. The data obtained from planning document, report, statistic, interview, and others related with airport and regional planning. **Results:** This paper have some results: 1) The great population around the airport which has potential by aircraft maneuver, it will affect environmental management in the area, 2) By observation, the environmental impact management of airport operation have been done properly and scheduled, 3) There no complaints from the public about the noise and environmental pollution caused by airport operations, 4) There is no plan to plant trees around the safe zone for flights. **Conclusion:** The environment and ecosystems around the airport are well preserved, but the social effect should be anticipated to prevent social effect.

#### INTRODUCTION

Good environmental conditions are needed to support sustainable development in order to maintaining ecological processes, the availability of sufficient resources, social, economic, and environmental as appropriate (Soemarwoto, 2001). One of bad effect is polluted air and water. The pollutants contained in exhaust gases of aircraft engines consisting mainly of carbon monoxide (CO), carbon dioxide (CO<sup>2</sup>), hydrocarbons, nitrogen oxides (NOX), soot, and other particles. The exhaust gas also contains organic acids and harmful pollutants that can be inhaled by humans and animals around the airport.

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Related aspects of the environment, destruction of ecology and hydrology on the construction and development of airports in Indonesia, PT Angkasa Pura II (2014) has made 12 reports to the management of the airport in Indonesia. Based on the report, it needs for integrated waste water treatment system that is structured systematically to address the issue of water used and to conserve water usage in order to keep the ecological sustainability of airports (Table 1). The existence of military defense equipment owned unit of the Air Force and other activities can cause noise and air pollution that needs to be organized in the use of space and time for the operation.

**Table 1:** Total Waste Management and Solid Waste Transportation Semester II, 2015

No.	Month	Total Waste (m3)	Total Transportation	Information
1	July	180	90 Rit	Twice per day by pick up transportation
2	August	186	93 Rit	
3	September	170	85 Rit	
4	October	180	90 Rit	
5	November	210	105 Rit	
6	December	200	100 Rit	
	Total	1126	563 Rit	

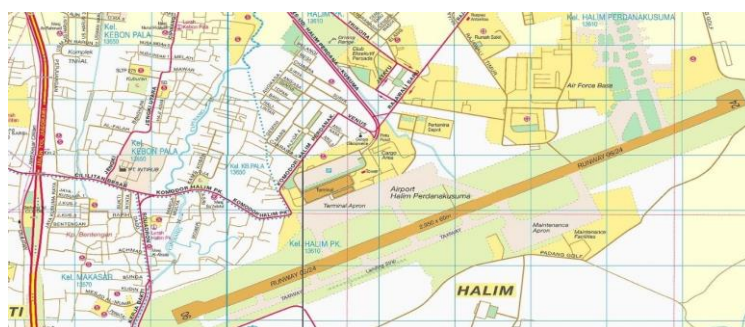
Source: Solid Waste Shelter in Halim Perdanakusuma Airport Semester II, 2015

Environment – friendly development concept is also referred to the concept of sustainable development. According to the Bruntland Report of the United Nations (1987), "The goal of sustainable development are reached how to fix the destruction of the environment without sacrificing the needs of economic development and social justice". This concept was also developed by the movement of green accounting Indonesia regarding the Global Reporting Initiative (GRI) which is used as the standard in sustainable development (Sukoharsono, 2005).

Etnomethodology is a theory in sociology who studies public resources, procedures and practices in which the members of a society to produce and recognize objects, events and social actions that can be observed with the five senses. Etnomethodology emerged as a reaction to some of the sociological perspective, particularly structural functionalism, which assumes that the behavior of causality was determined by factors of social structure. In social aspect, the fusion of monitoring and supervision in culture will be more focused on the door so that it become better monitored. The enclave civil airport in this study is Halim Perdanakusuma airport (Figure 1). This airport have been implemented sustainable development programs based on reports of PT Angkasa Pura II in 2014 – 2015 and the characteristics of this airports is located in the state capital as well as the airports is very busy. The purpose of this study is to formulate the development of airports based on sustainable development in environmental aspect.

### Method:

This study uses a qualitative method by etnomethodology, which according to Garfinkel (1967), the etnomethodological is decided to the base of an ad hoc judgenet not individual, but collective judgement, arising out of negotiation in the group (Fatchan, 2015). The data obtained from planning document, report, statistic, interview, and others related with airport and regional planning. The environment data have been collected subsequently processed by several methods of analysis, namely: Miles Huberman Data Analysis, Analysis of Participant Observation James Spradley and SWOT analysis.



**Fig. 1:** Location Map of Halim Perdanakusuma Airport

## RESULTS AND DISCUSSION

The implementation of environmental management at Halim Halim Perdanakusuma airport have been monitored and evaluated by PPLH – IPB in 2015. Table 1 and some figures (Figure 2 – Figure 4) are shown to explain the activities.

### *Miles Huberman Model Analysis:*

The obtained data have been collected in the form of the main points of the finding which relevant to the following discussion are presented in a narrative corresponding environmental, economic, and social aspect (Miles, 1994). The terrain condition around the airport Halim Perdanakusuma give effect on environmental pollution because of the number of trees around the area on the land side is rare. Some trees in the area is wild plant that can not drown out the sound of planes and not able to supply clean air from the assimilation of the tree.

The solid waste from airport operational, indoor and outdoor activity (office bulding, cargo, terminal includes shops, restaurants, banks, etc) can result in reduced level of fresh air which give effect to the health of the surrounding community. To overcome the problem of garbage is done by the separation between dry and wet garbage.

The domestic waste from the office and the overflow of rainwater with catchment area resulted in changes in the quality of chemical-physics of surface water and rivers around airports because of the increased content of organic/anorganic chemicals such as TDS, BOD, Cod, Mn, sulphide, nitrite, phenol, etc. The solution of this problem is drainage management, maintenance toilets and septictank. Runway operation and activities in the garage/workshop resulted in a decreased quality of ground water due to the use of chemicals from cleaning from cleaning activities rubber deposits and soil contamination from the spill or spill oil. There is a tank for used oil, special shelter for B3 waste, special shelters of B3 waste, and oil recycle effort.



**Fig. 2:** Waste Water Treatment Process



**Fig. 3:** Used Oil Shelter and The Main Channel of The Airport

Source: Report of Environmental Management and Monitoring Semester II, 2015

The climate at Halim Perdanakusuma airport and surrounding area is tropic throughout the year. The air quality changes indicated by some parameters such as SO<sub>2</sub> (sulfur dioxide), CO<sub>2</sub> (carbon dioxide), NO<sub>2</sub> (Nitrogen Dioxide), O<sub>3</sub> (oxidants), Hydrocarbons (HC), Dust (TSP), Lead (Pb), Ammonia (NH<sub>3</sub>) and hydrogen Sulfide (H<sub>2</sub>S) is derived from the activities of the movement of aircraft landing and takeoff, and land transportation in and out of the airport environment. The data is known that the most diseases suffered by many communities around airport is ISPA (Acute Respiratory Tract Infections), this disease can influence social conditions and public safety due to psychological pressure from the disease. Airport activity resulted in changes to types of vegetation including population and diversity, animal diversity in land and water. To anticipate the impact of flora and fauna existence, the airport management is focused on creating/maintaining the aesthetics of ornamental plants to the airport and collect data on animals around the airport.



**Fig. 4:** Flora Management in Landslide and Airside

Source: Report of Environmental Management and Monitoring Semester II, 2015

***Participant Observation James Spradley Data Analysis:***

This data analysis obtained from interviews and observations that includes domain analysis, taxonomic analysis, component, and theme analysis (Spradley, 1980). This below table is the result by James Spradley method (Table 2).

**Table 2:** The Results of Analysis and Discussion on Participant Observation James Spradley Data

No	Domain Analysis	Taxonomy Analysis	Component Analysis	Theme Analysis
1	The airport environment that greatly affects the sustainable development	<p>Climate and weather have a major influence on the operational airports</p> <p>Waste which can have implications on environmental pollution</p> <p>Noise can affect public health</p> <p>Surface water quality is very influential on the health of passengers and other airport service users</p> <p>Soil pollution is a result of the operation of the runway and activities in the garage/workshop</p>	<p>a. There are no big trees</p> <p>b. It is no yet to have cooperation to undertake tree plantation</p> <p>c. There is a urgency about the villagers around airport</p> <p>d. There is no information regarding social indication of noise impact</p> <p>e. Ecosystem or environmental aspects are still maintained and preserved</p>	<p>a. The number of trees at the airport is still lacking</p> <p>b. There is no cooperation between the airport and the air base to solve the noise problem</p> <p>c. It can give effect to the residents</p> <p>d. There is no problem in the noise</p> <p>e. The lack of coordination between the airport and airbase in environmental mitigation.</p> <p>f. Less preservation of ecosystems around the airport</p>

**SWOT (Strength, Weakness, Opportunity, Threats) Analysis:**

This method includes to identify strength, weakness, opportunity, dan threats. SWOT factor in this paper will be focused on environment aspect in Halim Perdanakusuma airport. Factor strength in this airport is as follows: 1) This airport is at strategic location, so it makes easy to reach by people, 2) Environment monitoring conducted twice per year, 3) The management of environmental impact of airport operations has been done properly and scheduled, 4) There is no complaints from public about the noise, 5) Environment and ecosystems around the airport is still preserved.

The weakness of this airport is 1) the existence of flying facilities were inadequate, 2) Greening the airport area is still lacking, 3) Airport area are close to the settlement give effect to the citizens, 4) Airport activity cause noise, 5) The waste is increasing. The third factor is opportunity is as follows 1) Religious life in society is well established to support the existence of the airport, 2) Vacant land that can be used to increase the production of oxygen as the lungs of the capital that will strengthen the presence of the airport. The last factor is threats: 1) Noise due to airport operations can cause discomfort in the community, 2) Inadequate flight facilities may endanger the flight.

**Conclusion:**

This paper have some conclusions: 1) The great population around the airport which has potential by aircraft maneuver, it will affect environmental management in the area, 2) By observation, the environmental impact management of airport operation have been done properly and scheduled, 3) There no complaints from the public about the noise and environmental pollution caused by airport operations, 4) The environment and ecosystems around the airport are well preserved, and there is no plan to plant trees around the safe zone for flights.

**Recommendation:**

- 1) To reduce the impact of air quality changes conducted by greening and planting the trees or park in the airport area.
- 2) To reduce the impact of noise generated planting trees, replacing dead trees and planting of noise barriers around administrative buildings, offices, and airport operations looks physically very less.

- 3) To keep the relation with the community to prevent the bad effect of airport noise.

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