

# Effectivity and Efficiency of Environmental Management and Monitoring by Private Sector (EEEMMPS) in South Sumatera

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## Effectivity and efficiency of environmental management and monitoring by private sector (EEEMMPS) in South Sumatera

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**Abstract.** Environmental management and monitoring could be improved following commitments by companies. Questions arise on how to measure effectivity and efficiency of environmental management and monitoring by the private sector, specifically in Musi Banyuasin and Banyuasin Districts of South Sumatra Province, inside the project boundary of Kemitraan Pengelolaan Lanskap Sembilang Dangku (KELOLA Sendang). The research aims to develop simple guidance to measure effectivity and efficiency of environmental management and monitoring for the private sector. The method used was an interview with respondents from companies on environmental monitoring systems, commitment and implementation in the field. Results show divisions of effectivity and efficiency categories into comprehensiveness of environmental management and monitoring systems, such as environmental regulations compliances; vision, mission, policy and commitment statement on the environment. Companies with a complete system show more confident in the effectivity and efficiency of environmental management and monitoring programs, while the other focuses on the environmental regulations compliances. Factors affecting effectivity are inter-department relationships as well as synchronization on policy and commitment between holding and subsidiaries. Factors affecting efficiency are budget and expenditure on environment management and monitoring with good programs. Fully functioning standard operational procedures (SOPs) and relationships with other stakeholders are also considered affecting effectivity and efficiency.

**Keywords:** effectivity, efficiency, environment, management, monitoring

### 1. Introduction

#### 1.1. Background

South Sumatra Province has an area of 91,592 km<sup>2</sup> [1]. As an illustration of production area size of South Sumatra, Musi Banyuasin District has 14,477 km<sup>2</sup> [2], which is around 15% of South Sumatra Province and gives the permit to largest land management business to the oil palm plantation, around 2,710 km<sup>2</sup> (or 271,000 ha) [3]. With the largest land management in the oil palm plantation sector aside forestry and plantation spatial problems are triggered by several reasons [4].

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Environmental problems occur due to poor environmental management include lack of quality or availability of clean water, and poor air or soil quality. Not only does it provide inconvenience to humans, but poor environmental management can also have consequences such as disturbances in wildlife, as well as a good habitat for wildlife. Poor environmental management will disrupt human life, animals and their habitat, even a violation of regulations or reduce the buyer's trust in products produced by oil palm plantation companies.

Analysis of environmental impacts must be carried out to avoid the negative effects of a development project as far as possible, both on wildlife life and on the environment [5]. EIA was carried out to estimate the consequences that may arise in the environment by industrial activities in the present and the future [6]. EIA should be part of the precautionary approach not to stop [7] the development and investment process but as an effort to plan the environmentally and socially responsible, sustainable production. The environment, social and economic aspects are utilized according to the needs of sustainable and environmentally sound economic improvement by the private sector, society and government. This requires insight and interdisciplinary and inter-jurisdictional studies so that they can or be handled through collaboration between organizations [8]. Government and non-government also play an important role in the processes, stages and monitoring of practices and performance in managing environmental impacts [9].

The private sector in practice should carry out its production operations in an environmentally sound and environmentally friendly manner, safeguarding the environment related to the conservation of protected animals and their habitats, as well as potential disruption of operational activities, and other factors. In fulfilling obligations and maintaining the environment (maintaining, improving environmental aspects, reducing disturbances), good environmental management is needed including in terms of planning, implementation, monitoring and evaluation. Good environmental management and monitoring are needed to ensure good environmental conditions are maintained. Several ways to measure management effectivity [10] can be evaluated using various approaches including self-evaluation, where all routine reports contain aspects of evaluation; evaluation by the head office, where head office staff will evaluate progress by comparing it with the expected plan or comparing it with other protected areas as a picture of work results; free assessment by outside experts, where a panel of several professional people provides free evaluation of the results of the management of each region; the local advisory committee, which involves local people, users of protected areas, concessionaires, members of other land use agencies or surrounding communities; direct response from visitors, using a questionnaire; compare spending and budget; evaluation of progress in terms of schedule; assessment of achievement of goals; evaluate cost-effectiveness; use of a checklist in evaluating management.

The benefits of environmental monitoring [11] are test the impact estimation so that it can be seen the conditions that exist or things that pass estimates; test the effectivity of activities and technology used to control the negative impacts that occur in the environment; obtain and understand early warning indications regarding unwanted changes in the ecosystem due to actions or activities. This is a corrective action that can be taken and refined. While the benefits of monitoring, in general, are obtained information and knowledge about critical circumstances and problems that will be able to provide input for the preparation of environmental policies in the future; helping environmental management efforts by providing input that can be used to assess the success or failure of past activities; test the effectivity of the truth of the provisions and restrictions given by the government.

Environmental and natural management can be carried out effectively if with reliable information about changes in the environment and the causes of these changes [12]. Emphasizes the importance of identifying potential indicators and evaluating their suitability [13] and to include all sources of uncertainty (potential risks) into the framework [14]. Detecting changes in ecological systems requires engineering and logistics and is a truly difficult challenge [15].

Regarding the efficiency of monitoring, it is important to consider between expenses and benefits in the process of designing a monitoring program [12]. Tools to analyze this cost and benefit could use the cost-benefit equation (CBE); a modern financial analysis tool for commercial operations in

measuring investment and profits [16]. Recognize and budget all program costs as a key factor in the age of the program [17]. A structural solution, institutions [18] for monitoring must be separate from management, and the rapid use of existing data in decision making [19]. In the long term, it is important for long-term and synoptic time series based evaluations from monitoring data to help determine whether to be reallocated in space or time to optimize the use of finance and human resources [20].

### 1.2. Aim

This study aimed to find out how to measure the effectivity and efficiency of environmental management and monitoring in the oil palm plantation sector in the Musi Banyuasin and Banyuasin Districts, South Sumatra Province.

## 2. Methodology

The research method used is the survey method, a namely descriptive survey using questionnaires/interviews and analytical surveys using rating [21] [22]. The method of determining the sample is purposive and accidental/incidental sampling [23] because the target of data collection is homogeneous and non-probability. Primary data collection methods are using interviews [23]. Data/information obtained from data collection will be analyzed by measurement of relationships [23]. Data collection was carried out in the Musi Banyuasin and Banyuasin districts of South Sumatra Province. Companies of 8 were interviewed from June until July of 2019. Respondents are representatives of companies related to sustainability which interviewed on the queries list (**Table 1**). The answer for each query was scored on the value of 1 if the answer was confirmed available/applied in the field, 0.1 to 0.9 or 0.5 for answers confirmed partly available/applied in the field, and 0 for confirmed not available/applied in the field. Information on interview results then divided into a ranking table which is then described. Analysis of the data, all queries are merged into the average for each respondent (company sustainability representatives). Values of queries average of each company then divided into levels which are then described based on condition (query answers and common internal situation; inter-department and staff). The levels separated into tables of effectivity and efficiency, consists of generalization on internal conditions.

## 3. Results and Discussion

### 3.1. Effectivity and Efficiency Queries

Environmental management and monitoring effectivity and efficiency factors are listed under complete queries (table 1) asked respondents on behalf of sample companies. The list itself comprises of the management and relationship aspects with internal or other stakeholders. The list developed from references regarding conservation area management and the observation of the process of engagement with the private sector during activities of production theme in KELOLA Sendang project on the environmental management, monitoring, organization and implementation aspects.

**Table 1.** Queries list to assess effectivity and efficiency of environmental management and monitoring.

Queries for Environmental Management and Monitoring Effectivity and Efficiency	
A	Comply with applicable regulations
B	Obtain location permit and business license
C	Conducting a baseline assessment
D	Doing what is recommended for management and environmental monitoring based on baseline and impact assessments
E	Have a vision, mission, policy and commitment related to the environment
F	Having an institution/organization for environmental management and monitoring
G	Has standard operating procedures for environmental management and monitoring
H	Have a department/sustainability section

**Queries for Environmental Management and Monitoring Effectivity and Efficiency**

I	There is good cooperation between departments
J	Monitoring information/data is used as a basis for direct repairs, reports to related parties, input for further management and monitoring plans
K	Has an environmental socialization program to employees/workers and the community
L	Has a neighborhood community economic assistance program
M	Neighborhood communities and employees/workers participate in maintaining the environment
N	Get support from academics, communities, non-government organizations in environmental management and monitoring
O	Neighborhood companies participate in maintaining the environment
P	Management and monitoring following standards under applicable regulations
Q	Creating and submitting environmental management and monitoring reports to related institutions
R	Get full control and support from the government
S	Budgeting every year sustainability activities
T	Measuring the success of environmental management and monitoring based on budget-expenditure
U	Measuring the success of environmental management and monitoring based on findings-actions
V	Measuring the success of environmental management and monitoring based on good reports
W	Measuring the success of environmental management and monitoring based on activities that run as planned
X	Recognizing law enforcement
Y	Believing the success of environmental management and monitoring based on internal factors (institutional, planning, budget, monitoring, evaluation), inter-department/division support, good community assistance program, good partnership with various stakeholders, law enforcement runs well
Z	Synchronization of environmental commitment between holding and subsidiaries

**3.2. Effectivity and Efficiency Leveling**

Companies of 8 are interviewed regarding the aspects of effectivity and efficiency (table 2). The answer of each company for each query were scored on the value of 1 if the answer was confirmed available/applied in the field, 0.1 to 0.9 or 0.5 for answers confirmed partly available/applied in the field, and 0 for confirmed not available/applied in the field; resulting 3 companies on level 1, 3 companies on level 2, 1 company on level 3 and 1 company on level 4. The level shows the effectivity and efficiency of environmental management and monitoring of all respondent companies in an effective and efficient state, with no respondents under no level state. This is due to companies have clear area and comply with the regulations and area permits, no companies having overlap with conservation area.

**Table 2.** Leveling results from respondents.

	PTA	PTB	PTC	PTD	PTE	PTF	PTG	PTH
A	1	1	1	1	1	1	1	1
B	1	1	1	1	1	1	1	1
C	1	1	1	1	1	1	1	1
D	1	1	1	1	1	1	1	1
E	1	1	1	1	0.5	0.5	1	0.5
F	1	1	1	1	0.5	0.5	1	0.5
G	1	1	1	1	0.5	0.5	1	0.5
H	0.5	1	1	1	0.5	0.5	1	0.5
I	1	1	1	1	1	0.5	1	1
J	1	0.5	0.5	1	0.5	0.5	1	0.5
K	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5
L	0.5	0.5	0.5	1	0.5	0	1	0.5
M	1	1	1	1	1	0.5	1	1
N	1	1	1	1	0.5	0.5	1	1
O	1	1	1	1	1	1	1	1
P	1	0.5	0.5	1	0.5	0.5	1	1
Q	1	0.5	0.5	1	0.5	0.5	1	0.5
R	1	1	1	1	1	1	1	1
S	1	1	1	1	1	0	1	1
T	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5
U	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5
V	1	1	1	1	1	1	1	1

Yes	=	1
Partly	=	0.1 - 0.9 or 0.5
No	=	0



	PTA	PTB	PTC	PTD	PTE	PTF	PTG	PTH	
W	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	
X	1	1	1	1	1	1	1	1	
Y	1	1	1	1	1	1	1	1	
Z	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	
	0.87	0.83	0.83	0.98	0.73	0.63	0.92	0.77	AVG
	II	II	II	IV	I	I	III	I	Lvl.

  

No Level	<	0.61
Level 1 (I)	=	0.61 - 0.80
Level 2 (II)	=	0.81 - 0.90
Level 3 (III)	=	0.91 - 0.95
Level 4 (IV)	=	0.96 - 1.00

Level 1 is of minimum environmental management and monitoring system but effective and efficient, yet this would provide troublesome (0.61 – 0.80) to a certain degree for the staff(s) in the field for the lack of resources and relationship with other departments are production-oriented if not combined department. Level 2 is more increase in the management and monitoring system, effective and efficient, yet would be exhausting for the staff(s) in the field (0.81-0.90), the purpose of the management and monitoring would be questioned by staff(s) due to lack of resolve or connection between information gathered in the field and management activities. Level 3 is more advance in management and monitoring system, effective and efficient, yet have slight difficulties in budgeting and to verify the achievements (0.91-0.95) of the environmental management and monitoring program. Level 4 is of synchronization of environmental commitment between holding and activities, budgeting shouldn't be difficult, effective and efficient, yet still have challenges (0.96 – 1.00) from internal and other stakeholders. Challenges for implementation would occur for every level of environmental management and monitoring programs.

The effectivity of long-term monitoring depends on the various characteristics that make up an effective monitoring program, such as: good questions and questions that continue to evolve, the use of conceptual models, selection of appropriate entities for measurement, good design, partnerships developing well, strong and dedicated leadership, continuous financing, frequent data usage, scientific productivity, maintenance of data integrity and field technical calibration [24]. Small things that are also important to note are field transportation, field staff, access to the location, the time needed in the field. Emphasize the importance of managing monitoring data for decision making [25].

### 3.3. Effectivity Factors Leveling

The leveling for effectivity (table 3) would comprise the organizational and implementation of SOPs. Regulations compliance and permits are essential before the development of concession as an area of production. Control and support from the government also essential for the private sector to perform the compliance of regulations. The internal process, organization and implementation are factors in the effectivity of the environment management and monitoring. The level of inter-department relationship and synchronization of environmental commitment between holding and subsidiaries would likely affect the implementation in the field. The connection between environmental and stakeholder/community engagement program also affecting the implementation in the field.

**Table 3.** Effectivity factors by levels.

Effectivity Factors			
Level 1	Level 2	Level 3	Level 4
Regulations compliance and permit	Regulations compliance and permit	Regulations compliance and permit	Regulations compliance and permit
Control and support from the government	Control and support from the government	Control and support from the government	Control and support from the government
Vision and mission exist	Vision, mission, policy exist	Vision, mission, policy, commitment exist	Synchronization of commitment between holding and subsidiaries
Sustainability Department co-exist	Sustainability department exist or co-exist	Sustainability department exist and have a good relationship with other departments	Sustainability department exist and have a good relationship with other departments
SOP exist	Functioning SOPs	Functioning SOPs	Functioning SOPs

Effectivity Factors							
Level 1		Level 2		Level 3		Level 4	
Monitoring following surveillance schedule		Routine monitoring exist		Functioning routine monitoring		Functioning routine monitoring	
				Monitoring results used for corrective action, report to related officials, inputs for the next management plan		Monitoring results used for corrective action, report to related officials, inputs for the next management plan	
A good relationship with other stakeholders		A good relationship with other stakeholders		A good relationship with other stakeholders		A good relationship with other stakeholders	
CSR by proposal		CSR by proposal		CSR by proposal		Community economic improvement program exist	
				Support from academics, community and NGOs		Support from academics, community and NGOs	

### 3.4. Efficiency Factors Leveling

Factors for efficiency (table 4) are close to the budget availability and the evaluation of the environmental management results. The expenditure of the environment management and monitoring program would affect the budget availability for next year's program. The orientation and way of the company to evaluate the program also affecting the availability of the budget following commitment and implementation in the field.

**Table 4.** Efficiency factors by levels.

Efficiency Factors							
Level 1		Level 2		Level 3		Level 4	
Budget exist		Budget exist		Budget support management and monitoring plan		Budget support management and monitoring plan	
		Evaluate budget-expenditure		Evaluate budget-expenditure		Evaluate budget-expenditure	
						Evaluate monitoring-corrective action	
Evaluate plan-process-results		Evaluate plan-process-results		Evaluate plan-process-results		Evaluate plan-process-results	
Create a good report		Create a good report		Create a good report		Create a good report	

Effective can be interpreted as giving effect or impact on aspects that are targeted [26]. Effectivity or effectiveness means influential conditions to support the goal or level of achievement of goals that compare and evaluate the planning, process, and results. Efficient can be interpreted as appropriate in doing something by not wasting time, energy, and cost (usefulness) [26]. Meanwhile, efficiency means the ability to carry out tasks (business, work) properly and correctly (not wasting time, energy, and costs). Management is the process of using resources effectively to achieve predetermined goals [26]. Environmental management means the process of using the resources owned by the company to achieve its goals and objectives in improving, maintaining environmental quality, reducing interference. Good management will show good performance results by maintaining management effectivity both in achieving goals and efficiency of resource use in management activities. Monitoring is to monitor, observe, or check carefully, especially for special purposes; regulate or control the work of a process and so on [26].

### 4. Conclusions

The effectivity close to the evaluation of the state of the organization, SOPs and implementation, while efficiency close to availability of the budget to support the environmental management and monitoring evaluation of the budget and expenditure. Effective and efficient mean that information of the actual condition in the field is used for corrective action, report to related officials and as input for next management and monitoring plan. Note that efficiency is not mean by cut, minimize the budget and expenditure. The guidance for measuring effectivity and efficiency of environmental management



and monitoring should not be used to judge certain entity, but a tool to self-evaluate the current management and monitoring system and implementation. Also, note that the environment is not for the company itself to manage and monitor but also the responsibility of all include government and community.

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