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Reconstruction of the Accounting System for the Bioposka Fertilizer Inventory: The Application of Soft Systems Methodology in the Botanic Garden of Indonesia

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The government must have an accounting system that contains the procedures for and requirements of managing resources owned, as a reliable accounting system is a reflection of the government's accountability for the public and is useful in designing policies to realize good governance. This study identifies several key issues related to the implementation of an accounting system for the bioposka fertilizer inventory, such as: inadequate recording of bioposka fertilizer, measurement of bioposka fertilizer based on selling price, inadequate presentation of the bioposka fertilizer inventory in the Balance Sheet and of expenses in the Operational Report, insufficient disclosure notes to financial statements, and supporting issues including a lack of employee competency and the less-than-optimal role of General Bureau as inventory manager. Using Soft Systems Methodology (SSM[1]), this research performs a reconstruction of the accounting system through four stages, namely: identifying the problematical situations which are then depicted in a rich picture, creating a conceptual model, carrying out a discussion, and formulating recommendations. It is suggested that those problematical situations be resolved by the related actors and institutions undertaking the following actions: repairing the inventory accounting procedure of the bioposka fertilizer, improving employee competency, and optimizing the role of General Bureau as the inventory manager. This research can be used as the basis on which to design an accounting system consisting of procedures and policies related to the accounting treatment of the bioposka fertilizer in the Botanic Garden of Indonesia.

Keywords: Government Institutions; Accounting System of Fertilizer Inventory; Soft Systems Methodology.

1. INTRODUCTION

Inventories are an important component of an entity because inventory compositions can account for up to 30% of total assets[2]. Good inventory management will bring economic benefits, profitability, and image organization, and one of the determining factors of the success of inventory management is the quality of personnel[3]. Inventory information should exist in a system as a control[4]; this is in line with the explanation stated that inventory records are documents that provide information about inventory movements[5]. The inventory manager will use an integrated system to produce information that can be useful in decision making[6]. In addition, some of the ways in which to control inventory are to recruit, train, and develop the capacity of supply managers[7].

Relating to the management and administration of inventories, the government has issued Regulation of the Director General of Treasury Number PER-40/PB/ 2006 concerning Inventory Accounting Guidelines to ensure that government agencies are able to achieve uniformity of inventory administration.

Although the government provides a variety of regulations and systems to improve inventory management and administration, various issues persist. The Supreme Audit Board (2016) disclosed that the weakness of the Internal Control System Central Government Financial Statements related to the administration inventories at seventeen Ministries and Institutions was IDR 5.60 trillion. One of the inventory- related issues is that the balance of inventories in the Balance Sheet is not presented fairly and no physical examination is carried out at the end of the year.

The Botanic Garden of Indonesia has various types of supplies, one of which is a bioposka fertilizer obtained from the production. The administration of the inventory at the Botanic Garden is undertaken by the Sub Division General, who is directly responsible to the Head of Administration. The factual issues discovered by the Supreme Audit Board in the process of measuring bioposka fertilizer using its selling price are never disclosed as inventory in the financial report.

Several previous studies have made findings related to inventories. Previous research identified issues concerning the inventories of the Ministry of Health in Kenya including discrepancies between inventory records and physical goods, inventory being lost due to inaccurate records, and a lack of qualified supplies officers[4]. Another research disclosed problems related to the management of medicine supplies at RSUD Abdul Wahab Sjahranie Samarinda, namely: irregularities in the recording of drug supplies due to an unrecorded purchase transaction resulting in a discrepancy in the inventory at the end of the year[8].

Of the several problems, it is important to note that the calculation of the cost of bioposka fertilizer production requires the application of cost accounting. Askarany and Smith conducted research on composting production in New Zealand which resulted in the determination of compost production costs using a Time-Driven Activity-Based Costing approach with a single driver method for each cost hierarchy[9]. Meanwhile, research conducted by Lim on newly industrialized countries revealed that the Full Cost Accounting approach may be used by waste management industries because it makes it possible to include the external costs of environmental decision making, specifically relating to encouraging sustainable development in various fields[10]. Currently the Government of Indonesia does not utilize cost accounting guidelines. The importance of cost accounting by the government in calculating the actual cost per unit of a product or service generated and in fulfilling the need for financial reform as a means of tracking the unit cost of a service and comparing the efficiency of some service providers have been emphasized[11]. The international world, the study on the perspective of government cost accounting conducted by the International Federation of Accountants Public Sector Committee, explains that one of the functions of cost accounting is to set prices and costs, as well as to control and reduce costs; there is no material difference between the application of cost accounting to the government and to the private sector.

As a research reference, this reconstruction explores the problems in the Botanic Garden of Indonesia concerning production inventory, and is based on various findings related to inventory management which have previously been disclosed. In this research, a reconstruction of the bioposka fertilizer inventory will be conducted. Through Soft Systems Methodology (SSM), the researchers solve problems concerning the human activity system from the perspectives of all parties related to the application of the bioposka fertilizer inventory. Furthermore, the researchers will formulate recommendations agreed upon by all parties involved in the reconstruction of the accounting system of the bioposka fertilizer inventory.

2. LITERATURE REVIEW

A simple mathematical model in order to optimize the inventory policy not only of firms but also of government agency units has been created[12]. Those concepts included finished goods being produced by single cast and some of the inventories arising when needed to enable a flexible future. An inventory model must include cost elements such as capital cost, deposit cost, insurance and tax, along with material handling and all costs related to inventory acquisition[13].

Inventory measurement and supervising are not only conducted through inventory stock checking, but also through checking the information flow regarding the inventory[14].

INVENTORY RECOGNITION. Recognition is a process undertaken to fulfill a measurable Balance Sheet relevantly, including an account description in monetary values. An account should fulfill certain definitions and elements of a claim, including time estimation, and involves the recording of transactions[15]. An inventory includes current assets, and is recognized when the government gains its benefits and profits. Moreover, an inventory states how much product has been owned, sold or consumed in a normal cycle of twelve months. The inventory amount recognized as an expense is based on previous costs including the amount of inventory sold and distributed, and the production overhead.

INVENTORY MEASUREMENT. Measurement is the process of numbering used to represent quality based on classification[16]. One of the requirements for the recognition of a financial statement is a reliable measurement. Reliability refers to two aspects: the accuracy and certainty of measurement, and disclosure that represents the underlying transactions and economic events[17]. The first statement is that “no measurement is free of error except counting.”

INVENTORY PRESENTATION AND DISCLOSURE. IPSAS 1 states that an entity must present assets and liabilities, and revenues and expenses separately. The classification of assets and liabilities should be presented in the financial statement by combining each asset and liability with the expected amount within twelve months or more after the reporting date[18]. An entity is given permission to present the inventory as a current asset and to classify several other accounts based on liquidity measures, in order to provide more reliable and relevant information.

Inventories should be disclosed in the main financial statements or in the notes to the financial statements covering: (a) the accounting policies used in measuring inventories, including the cost formula used; (b) the total number of inventories recorded and the classification of its value to the entity; and (c) etc.

3. RESEARCH METHOD

This study is designed to improve the problems in applying the accounting of the bioposka fertilizer to government agencies. Owing to the complexity of the problems occurring, and as the inventory accounting reconstruction process is a human activity system, this research uses the SSM approach. The study also designates the researchers as an integral part of the human activity system in the Botanic Garden; this may complicate the

issues, and influence the interrelations between the parties involved[19].

SSM is an action-oriented finding process that may be implemented to solve real-life, everyday problems[1]. SSM users carry out the learning, which starts with recognizing the problematic situation, followed by formulating actions to improve it. One characteristic of SSM as an action research method is that it involves the participation of the relevant parties. As such, this method is expected to answer the research question, and to provide recommendations of actions that are systematically desirable and culturally feasible. The four stages of SSM are: identifying the problematic situation, creating a purposeful activity model, holding a discussion, and defining/taking action[1].

A rich picture is an image created to capture the relationship situation, the structure of the object studied, the process taking place, and the issues that are the subject of attention[1]. Problematic situations occurring in the accounting treatment of the bioposka fertilizer in the Botanic Garden of Indonesia become the concern of the parties illustrated in the following figure:

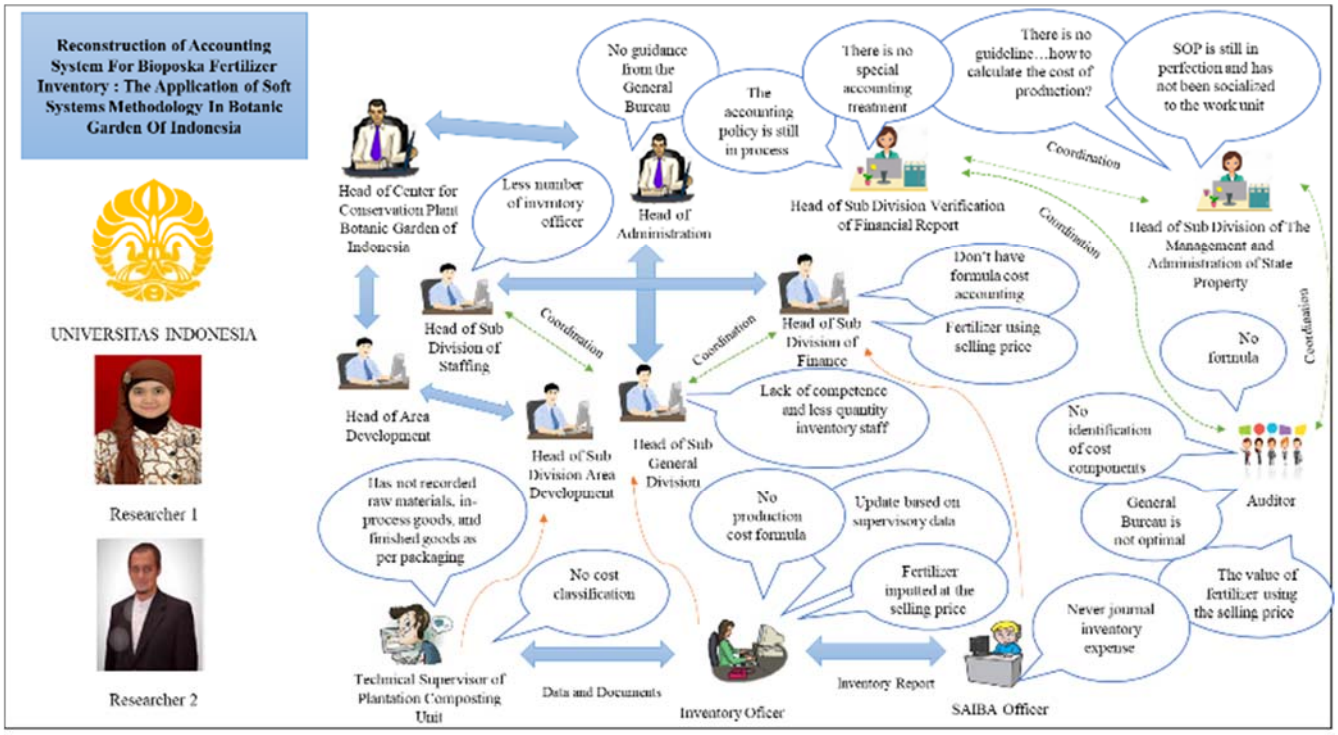

Fig.1. Rich Picture

4. RESULTS AND DISCUSSION

Based on the rich picture, several concerns of the parties relate to the management and administration of the bioposka fertilizer inventory at the Botanic Garden of Indonesia, in every stage of the accounting process.

At the recording stage, this institution does not have records of the raw material and goods used in the process on the inventory cards. The record of the goods inventory of the bioposka fertilizer has also not been classified. IPSAS 12 states that goods and raw materials inventory in process must be recorded according to their classification; this information will also be useful for the financial statement user. The inventory recording system is an instrument used to store information in order to control the inventory[4]. An inventory record is a document providing information about inventory flow[5].

At the measuring stage, this institution quantifies bioposka fertilizer based on its selling price. However, an inventory must be measured and should include a goods conversion cost in its process to produce a finished goods inventory, such as direct related cost with production unit[15]. IPSAS 12 explains that the inventory acquisition in the production process of the government bureau can be measured by standard cost. Moreover, the inventory officer never reviews the records of the bioposka fertilizer inventory and never conducts stock-taking of bioposka fertilizer. However, inventory personnel should review inventory records to ensure the accuracy of the information and stock-taking with recognition of inventory expenses at the end of the period[4].

At the presentation stage, this institution has not presented goods and raw material inventory in the process of creating the Balance Sheet, nor have inventory expenses been presented in the Operational Report. IPSAS 12 states that an inventory is an asset classification that must be presented in financial statements, and each decrease in the amount of inventory should be recognized as an expense in that period.

At the disclosing stage, this institution has not reported the inventory appropriately in the Notes of Financial Statement. IPSAS 12 states that a financial report must contain the accounting policy used to measure the inventory status, such as the cost formula, the amount of inventory as expense, etc.

The composting activity level consists of the amount of food and green waste to be processed into raw materials, raw material preparation and mixing, thermophilic phase, maintaining screening, and final mixing before selling[11]. Generally, the composting system is divided into two categories: the passive aeration system in which the air flows without the use of any tools, and the active aeration system in which air flows as a result of machine pressure.

This research formulates three transformations to be implemented in reconstructing the bioposka fertilizer accounting system "repairing of inventory accounting procedure of bioposka fertilizer", which have been tested using the CATWOE analysis, as described in the following table:

Table.1. CATWOE Analysis of the Bioposka Fertilizer Accounting System Transformations

Customer	Botanic Garden of Indonesia
Actor	Botanic Garden of Indonesia, Sub Division State Property Management and Administration General Bureau, Sub Division Verification of Financial Report
Transformation	Inappropriate accounting procedure of bioposka fertilizer inventory → Appropriate accounting procedure of bioposka fertilizer
Weltanschaung	All transformation will increase the relevancy and validity of inventory value and information on financial statements, so that the inventory accounting system of bioposka fertilizer can be applied appropriately.
Owner	Head of Botanic Garden of Indonesia
Environment	Budget, Time, Human Resources, and Production cost accounting policy in Government.

The planned transformations can be conducted by the researcher through some logic steps formulated in a conceptual model. These steps are a series of human activity systems applied to the activity of fertilizer management and administration. Those activities can be seen in this conceptual model:

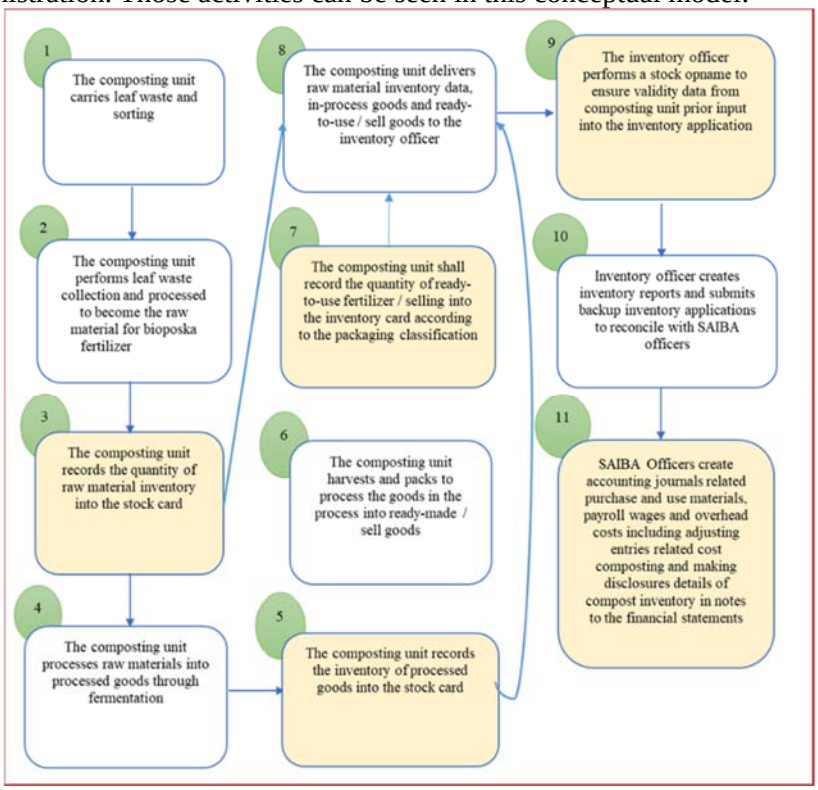

Fig.2. Conceptual Model of the Repairing of the Inventory Accounting Procedure of the Bioposka Fertilizer

The discussion about the conceptual model of the repairing of the inventory accounting procedure of the bioposka fertilizer (figure 2) has been conducted at the Botanic Garden of Indonesia. Debating with all the actors

has led to agreement on a recommendation. The recommendation asks the Botanic Gardens of Indonesia to take the following actions:

a. Record the quantity of raw material and finished goods inventory in inventory cards, including preparing the inventory card type;
b. Conduct stock-taking before inputting data to the inventory application by adding the stock-taking bioposka fertilizer procedure into the standard operating procedure of the inventory; and
c. Synchronize the journal of bioposka fertilizer inventory during every stage of the bioposka fertilizer accounting procedure.

5. CONCLUSION

This research confirmed that SSM is suitable for use in conducting participatory learning in the Botanic Garden of Indonesia in order to develop the bioposka fertilizer inventory accounting system. Some of the recommendations produced meet the requirements of being systematically desirable and culturally feasible[1]. The recommendation relating to the accounting procedure has been agreed upon and will be implemented by the Botanic Garden of Indonesia to improve the problematic situation currently present in the accounting process of the bioposka fertilizer.

This research has some limitations. These are that: (1) this study was conducted in only one of the four botanical gardens; and (2) this research, in the process of identifying problems, received limited agreement from certain parties. Based on these results, some suggestions may be made. These are: (1) for the Botanic Garden of Indonesia to follow up the recommendation; and (2) that the object of future research may be expanded.

REFERENCES

[1] P. Checkland, J. Poulter. Learning for action: a short definitive account of soft systems methodology and its use for practitioners, teachers and students, John Wiley & Sons Ltd., London, (2006).
[2] K. J. Ng'ang'a. An assessment of the factors influencing effectiveness of inventory control: Ministry of State for provincial administration and internal security, Nairobi-Kenya. International Journal of Business and Commerce. 3(1)(2013) 33-53.
[3] E. Osei-Mensah. The effect of inventory management practices on service delivery at ST. Martin's Hospital, Agroyesum, Amansie-West, KNUST School of Business, Ghana, (2015).
[4] M. E. Mwangi. An assessment of the effectiveness of stock records system; Ministry of Public Works, Kenya. International Journal of Business and Commerce, 3(1)(2013) 15-32.
[5] N. A. Saleemi, N. A. Storekeeping and stock control simplified, Saleemi Publications, Nairobi, (2007).
[6] R. McLeod, G. Schell. Management informastion system, 10th Edition, translated by Ali Akbar Yulianto dan Afia R Fitriati, Salemba Empat, Jakarta, (2008).
[7] P. Bailey, D. Farmer. Managing materials handbook, Gower Press, Aldershot, (1982).
[8] Arniati, D. R. Deviyanti, D. M. Sari. Analisis perlakuan akuntansi persediaan obat-obatan pada RSUD Abdul Wahab Sjahranie Samarinda, Publikasi Ilmiah Universitas Mulawarman, 1(1)(2013).
[9] W. C. Rivenbark. A historical overview of cost accounting in local government. State and Local Government Review, 37(3)(2005) 217-227
[10] M. Lim. Full cost accounting in solid waste management: the gap in the literature on newly industrialized countries. JAMAR. 9(1)(2011) 22-36.
[11] A. Davood, A. W. F. Smith. Cost benefit analysis of organic waste composing systems through the lens of time driven Activity Based Costing. JAMAR, 12(2)(2014) 59-74.
[12] K. J. Arrow, T. Harris, J. Marschak. Optimal inventory policy. Econometrica, 19(3)(1951) 250-272.
[13] R. H. Bock. Measuring cost parameter in inventory models. Management Technology, 4(1)(1964) 59-66.
[14] R. L. Ballard. Methods of inventory monitoring and measurement. Logistics Information Management, 9(3)(1996) 11-18.
[15] International Public Sector Accounting Standards Boards. International public sector accounting standard 12, Inventories, IFRS Foundation, United Kingdom, (2011).
[16] R. Chambers. Measurement in accounting. Journal of Accounting Research, 3(1)(1965) 32-62.
[17] J. Godfrey, A. Hodgson, A. Tarca, J. Hamilton, S. Holmes. Accounting theory 7th Edition, Milton Qld: John Wiley & Sons Australia, Ltd, (2010).
[18] International Public Sector Accounting Standards Boards. IPSAS 1, Presentation of Financial Statements, International Public Sector Accounting Standards Boards, London, (2006).
[19] D. Nordiawan, E. Prasodjo, S. Hardjosoekarto. Reconstruction of performance-driven culture: application of soft systems methodology at East Java Province, Indonesia. Proceedings of the 16th European Conference on Research Methodology for Business and Management Studies, Dublin Institute of Technology (DIT), Dublin, United Kingdom, (2017).

APPENDIX

Proposed Production Cost of the Bioposka Fertilizer

No.	Description	Quantity	Value (IDR)
Raw Material Cost			
Main Raw Material			
1	Leaf litter	70 tons	0,00
Supporting Raw Material			
1	Decomposer/starter	30 kg	900.000,00
2	POH/Microbes	7 liters	140.000,00
		Total of Cost Raw Material	**1.040.000,00**
Direct Labor Cost			
1	Labor 1	Freelancer	2.085.440,00
2	Labor 2	Public Servant	2.524.758,00
3	Labor 3	Public Servant	3.869.936,00
4	Labor 4	Public Servant	2.095.092,00
5	Labor 5	Public Servant	2.085.440,00
6	Labor 6	Freelancer	2.085.440,00
7	Labor 7	Freelancer	2.085.440,00
8	Labor 8	Public Servant	3.019.744,00
		Total Direct Labor Cost	**19.851.290,00**
Overhead Cost			
1	Diesel Fuel	60 liters	450.000,00
2	Tools		
	a. Fork	2 pcs	80.000,00
	b. Pot	7 pcs	210.000,00
	c. Broom	3 pcs	45.000,00
	d. Thermometer	1 pcs	25.000,00
	e. Scissors	1 pcs	15.000,00
	f. Plastic	30 kg	750.000,00
	g. Fermented Plastic	1 roll	500.000,00
	h. Sack	450 rolls	1.350.000,00
	i. Thread	5 rolls	50.000,00
	j. Pipe	30 meters	150.000,00
3	Depreciation Cost		
	a. Fermented compost building	1 unit	133.151,00
	b. Compost processing building	1 unit	3.036.667,00
	c. Impulse sealer machine	1 unit	12.500,00
	d. Grilling machine	1 unit	543.750,00
	e. Composting mixer machine	1 unit	307.083,00
	f. Portable bag	1 unit	13.020,00
	g. Balancing	1 unit	550.000,00
	h. Tossa (motorcycle)	1 unit	1.809.766
4	Electric Cost	40 Kwh	60.000,00
		Total overhead cost	**10.090.937,00**
		Total production cost	**30.982.227,00**
		Total production standard (Kg)	**12.000**
		Production cost / kg	**2.581,85**