

International Conference on Inventions & Innovations for Sustainable Agriculture 2016, ICIISA 2016

## Sustainability Indicators for Assessing and Monitoring the Sustainable Land Management in the Commercial Rice Zone of the Lower Pak Phanang River Basin, Thailand

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### Abstract

The main land use in the lower Pak Phanang river basin is intensive paddy production. It is also promoted as a commercial rice farming zone by the Royal Project. The objective of this study, hence, was to identify the appropriate sustainability indicators for assessing and monitoring this area under the ASEAN community. This evaluation comprised of the diagnosis of problems, the analysis of stakeholders and the description of Land Utilization Types (LUTs). This led to the diagnostic criteria weighting, indicators of development and sustainability by the participatory approaches. The data were collected through literature reviews, structure-questionnaire, focus group discussion with local stakeholders and individual interviews using the techniques of Participatory Rapid Appraisal and conceptual content analysis. This resulted in the diagnostic criteria following the framework for evaluating sustainable land management, which are productivity, security, protection, viability, and acceptability. There are a number of indicators with 22 items. The sustainability indicators in this study can be applied and evaluated in intensive paddy production areas which may lead to a strategy plan and greater sustainability in the future.

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Peer-review under responsibility of the Faculty of Animal Sciences and Agricultural Technology, Silpakorn University

*Keywords:* sustainability indicators; sustainable land management; commercial rice; Pak Phanang River Basin.

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## 1. Introduction

Pak Phanang river basin, one of the most important river basin in Thailand, located in the middle of the southern peninsular. The lower Pak Phanang river basin consists of a river flood plain. The land use is mostly irrigated paddy because it has been promoted as a commercial rice farming zone from the Royal Project. Presently, ASEAN and local markets are the main target for the commercial rice products of this area. Hence, the objective of this study was to identify the appropriate sustainability indicators for assessing and monitoring sustainable land management within the ASEAN community.

This study aimed to use the FESLM: International Framework for Evaluating Sustainable Land Management (Dumanski and Smyth, 1993) for developing the sustainability indicators in a commercial rice zone. The following steps were implemented in order to achieve this goal: (i) identifying problems and all stakeholders in the study area, (ii) integrating the information in the first step to explain Land Utilization types, (iii) selecting indicators and determining a weight for each indicator of these five pillars.

These indicators were built-up at local scale (i.e. small watershed and sub-district) by participatory approaches in order to evaluate sustainable land management using the Geographic Information System for further study. Moreover, these indicators provide politicians and other stakeholders with a simple monitoring tool.

## 2. Materials and Methods

### 2.1 Study area

This study was conducted in the commercial rice zone of Nakorn Si Thammarat District, situated in the southern part of the lower Pak Phanang river basin, Thailand. The study area covers 49,179 acre. The characterization of paddy fields, by using satellite image, can be seen as a continuous sheet, up to 80% of the available land. The farmer, who has access to irrigation facilities, plants 2-3 crops/year. The study area included the Tambon Chiengkoa, Tonglamjiuk, Palakam, and Bangtapong Pak Phanang sub-districts as shown in Figure 1.

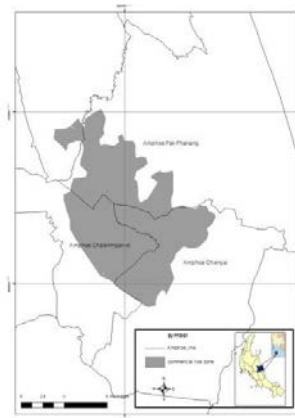


Fig 1. Commercial rice zone in the lower part of the Pak Phanang river basin

### 2.2 Sustainable Land Management: SLM

Sustainable Land Management combines technologies, policies, and activities aimed at integrating socioeconomic principles with environmental concerns, so as to simultaneously:

- maintain or enhance production/services (Productivity)

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