

# ECONOMICS ANALYSIS ON RICE PRODUCTION PROVIDING ENVIRONMENTAL SERVICES



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## Introduction

Payment for environmental services is a program providing payment to group of people whom join to preserve environment and keep it clean. These payments will contribute to decrease their poverty through direct and indirect payment and to keep the balance of environment. The payment could be funded by environmental service user. This program was made first on agricultural policy in developed countries [1].

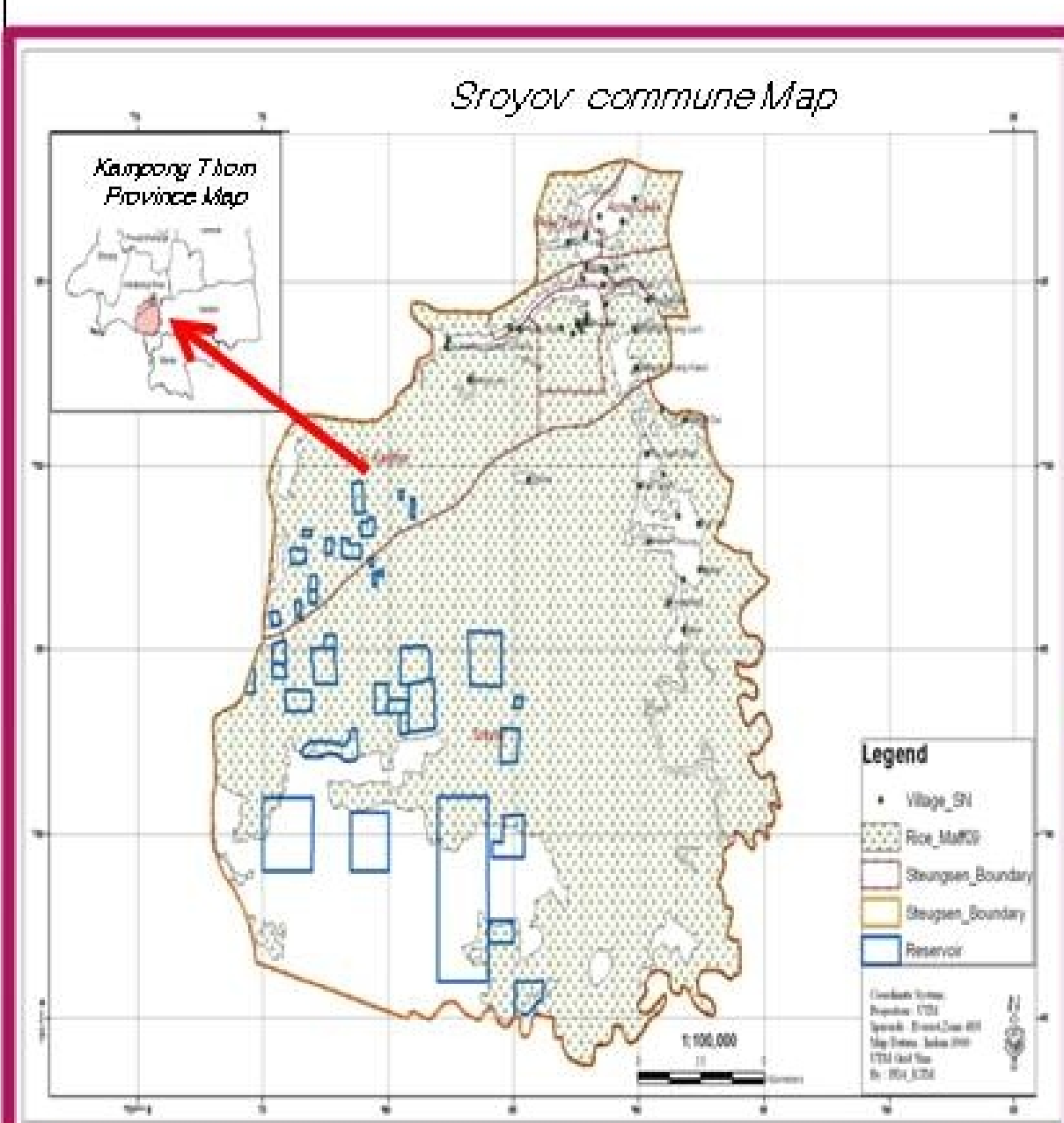
Rice paddies provide a number of ecosystem services such as: primary production, gas regulation, nitrogen transformation, soil organic matter accumulation, water regulation and flood control [2]. At the same time, rice paddy ecosystems can have adverse effect on the environment when there is an excessive addition of chemical fertilizer and pesticide and through greenhouse gases emissions [3].

## Objectives

- ❖ To study on rice production in study area
- ❖ To analyze economics value and efficiency of each rice productions

## Research Method

This study was conducted from May to August 2012. This topic was studied in Stueng Saen district, Kampong Thom province, Cambodia, situated on the floodplain of Tonal Sap Lake landscape.



Using both quantitative and qualitative data

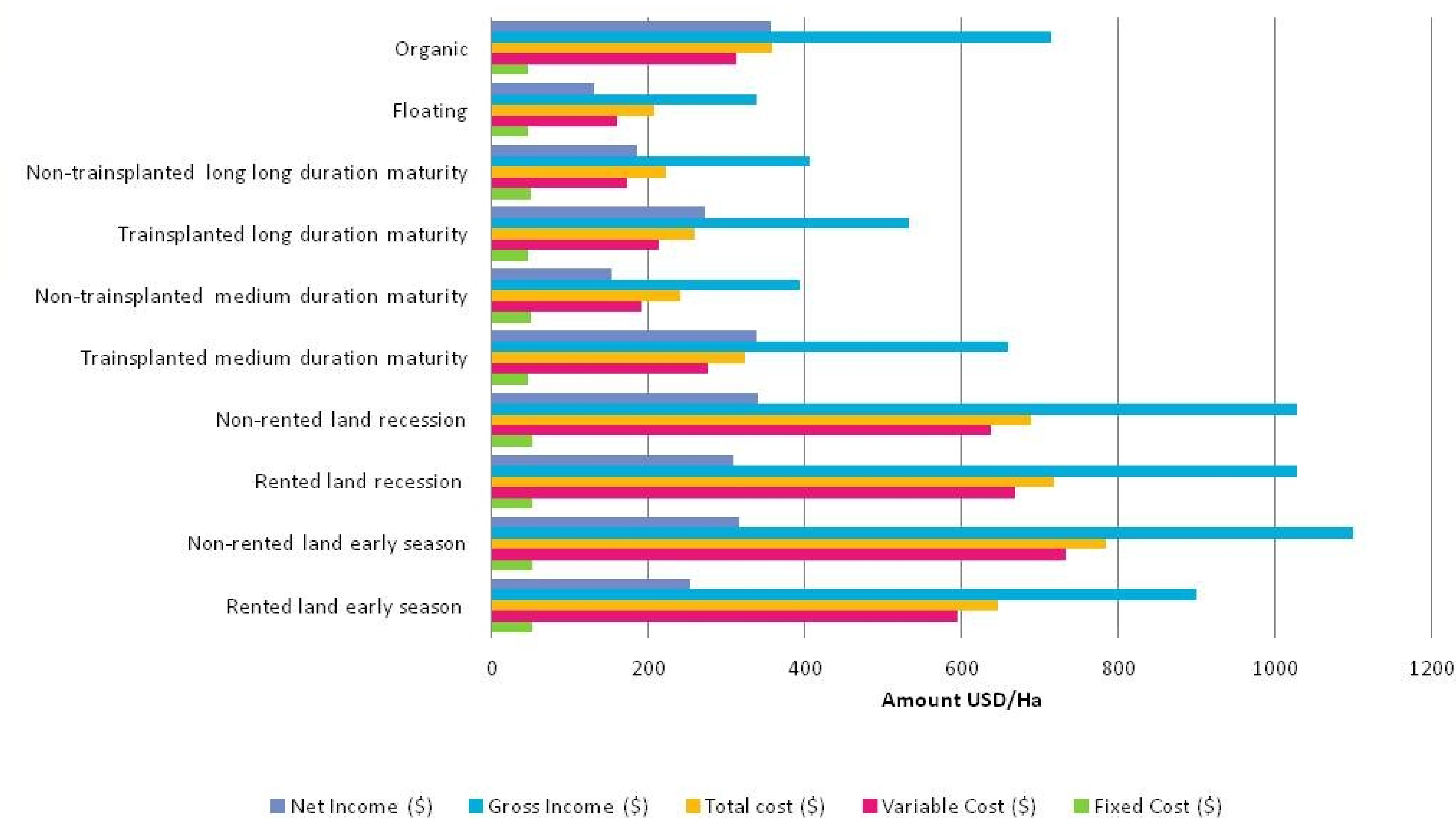
86 farmers were interviewed by using questionnaire

6 people were interviewed by using semi-structure interview

## Main Finding

- Rice agro-ecosystem is divided into 3 zones: high land, medium land and low land (flooded grassland, shrub land and forest) counting from the national road until flooded forest of the lake.
- Farmers choose rice production depend on landscape.
- There are three types of rice production which potentially provide ES because of non-using chemical input and non-converting flooded forest land: transplanted medium duration maturity rice, transplanted long duration maturity rice, organic rice and floating rice.
- Potential ES provided by those rice production:
  - Water quality, biodiversity conservation, greenhouse gas emission, water regulation, habitat, timber and non-timber production, fish and aquatic species for food

- In economics calculation, there are ten rice productions were divided according to technique and farmers' investment.



- Rice productions which have no potential to provide ES (Early season and recession rice), provide high yield and high gross income per hectare.
- Price premium of organic rice can ensure income for farmer

	Rented land early season	Non-rented land early season	Rented land recession	Non-rented land recession	Transplanted medium duration	Non-transplanted medium duration	Transplanted long duration	Non-transplanted long duration	Floating	Organic
Economics efficiency	1.39	1.40	1.43	1.5	2.04	1.6	2.0	1.83	1.6	2.00

- Transplanted medium and long duration maturity rice have high efficiency ↔ low variable cost
- Organic rice have high efficiency ↔ low variable cost and price premium

## Conclusion

Non-using chemical fertilizer, pesticide and herbicide are good external activities in rice production to decrease greenhouse gases emission in agricultural sector and there are no more impact on environment. The potential environmental services are carbon sequestration, water and biodiversity conservation. These productions have higher economics efficient than others and providing environmental services. Farmer can get more benefit when they don't spend money on chemical fertilizer, pesticide and herbicide. For farmer growing organic rice can get more price premium. Thus, labeling rice to get price premium seem to be a solutions to ensure ES provided by rice production system. On the others hand early and recession rice are best option to minimize risk from flood.

## References:

- [1] Pagiola, S., et al. 2007. Paying for the environmental services of silvopastoral practices in Nicaragua. *Ecological economics*, 374-385.
- [2] Xiao Y., et al. 2011. Evaluation of Ecosystem Services Provided by 10 Typical Rice. *Journal of Resources and Ecology*, 329-337.
- [3] Tin Ponlok, B. M. 2009. *Climate Change and the Clean Development Mechanism*. Phnom Penh: CRCD.

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