



# The Effects of Agrochemicals on Biodiversity in Cambodian Rice Paddies

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## Introduction

Harvesting rice is essential to the Cambodian economy and culture. Cambodian farmers harvest more than just rice; they also harvest and consume the fauna that live within their paddies. Rising global rice demand has pushed Cambodian farmers to use agrochemicals (pesticides, fertilizers, fungicides) to increase their yields. Many of these chemicals are highly toxic, and may have adverse effects on the fragile food chains within the paddies.

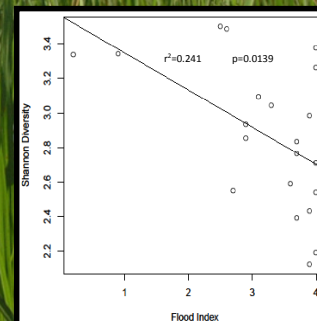
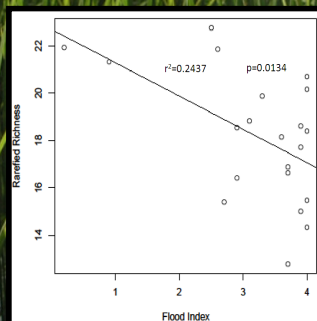
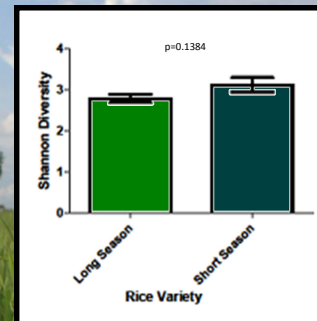
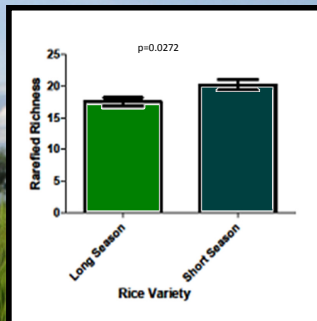
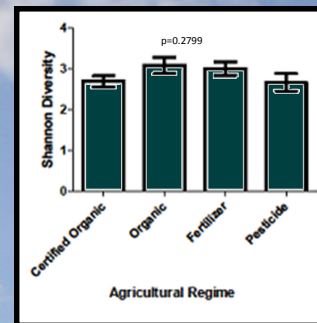
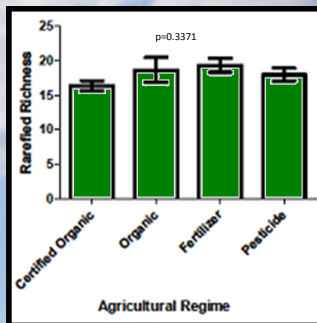


## Objective

This study was conducted to determine the effects of agrochemical use on the biodiversity and species richness found within Cambodia's lowland irrigated rice paddies.

## Methods

- We sampled a total of 21 rice paddies in four different treatments
  - Pesticide-treated
  - Synthetic fertilizer-treated
  - Organic
  - Isolated organic
- Two varieties of rice were sampled
  - Short season (matures in 3-4 months)
  - Long season (matures in 5-6 months)
- Sampling time was standardized based on paddy area (m<sup>2</sup>)
- We calculated the flood index (% water cover)
- Amphibian sampling methods:
  - Sweep netting (mornings)
  - Opportunistic capture (evenings)
  - Call recording (evenings)
- Terrestrial insect sampling methods:
  - Sweep netting (mornings)
  - Pit-fall traps (evenings)
- Aquatic invertebrate sampling methods:
  - Aquatic sweep netting (mornings)



## Acknowledgements

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## Results

- There was no significant effect of agricultural treatment on species richness or biodiversity.
- Species richness was significantly affected by rice variety
- Biodiversity was not significantly affected by rice variety
- Richness and biodiversity were both significantly affected by water coverage

## Discussion

Our results indicate that the species richness and biodiversity of treated and untreated paddies was about equal. This trend may be explained by the fact that even though not all farmers use agrochemicals, the close proximity of rice paddies undergoing treatments may lead to cross-contamination.

In addition, our data may have been skewed by the extraordinarily dry rainy season that Cambodia experienced during the time we were sampling.

## Further research

A more thorough, long-term investigation that would compare completely isolated organic paddies to areas being treated by agrochemicals is needed to follow up on this research.

## Selected References

- Shams, N. 2007. Contribution of rice field ecosystems to food security strategies in northwest Cambodia. *Journal of Sustainable Agriculture* 29:4 pp 109-133.
- Helmers, K. 1997. *Rice in the Cambodian economy: Past and present*. International Rice Research Institute, Philippines pp 1-14.