

Primary Contact: Jacqueline Halbrendt, PhD Student

Dept. of Natural Resources & Environmental Management

University of Hawaii at Manoa, Honolulu, Hawaii

E-mail: [jhalbren@hawaii.edu](mailto:jhalbren@hawaii.edu)

Phone: 808-779-4686

---

## **An Integrative Approach for Introducing Conservation Agricultural Practices to Tribal Societies in India.**

**J. Halbrendt<sup>1</sup>, C. Lai<sup>1</sup>, C. Chan-Halbrendt<sup>1</sup>, T. Idol<sup>1</sup>, C. Ray<sup>2</sup>, C. Evensen<sup>1</sup>, and P.K. Roul<sup>3</sup>**

<sup>1</sup>*Dept. of Natural Resources & Environmental Management, University of Hawaii at Manoa, Honolulu, Hawaii, USA*

<sup>2</sup>*Dept. of Civil & Environmental Engineering, University of Hawaii at Manoa, Honolulu, Hawaii, USA*

<sup>3</sup>*Dept. of Agronomy, Odisha University of Agriculture & Technology, Bhubaneswar, Odisha, India*

Subsistence farmers in the state of Odisha, Eastern India have struggled to produce sufficient crop yields with conventionally tilled, low-input, mono-crop farming systems. Odisha State is among the poorest in India, with the population highly dependent on maize and rice for sustenance. Farms here are typically small (<2 ha) and prone to soil degradation. The objective of this project was to develop conservation agriculture-based alternatives to current farmer practices through the assessment of experimental field trials and socio-economic surveying to evaluate the impact of such changes to the village economy. The field trial assessed maize production under treatments that included combinations of no-till, intercropping with legumes, and relay cropping with a cover crop to compare the effects of conservation agriculture practices with conventional methods. A complete randomized block design experiment with 8 treatments and 3 replications was conducted in 2010 to evaluate changes in yield, labor and input costs for different approaches. Face-to-face interviews were conducted in three villages, the data from which was used to develop a farm household model identifying farmer practices, inputs, labor demands, and crop yields. Results of the field trials and survey results showed the optimal conservation agriculture treatment as no-till maize intercropping with cowpea, which had the best outcome for increased yields with improved potential for income generation and household food security. This integration of agronomic and economic data analysis allows for the development of site-specific alternatives which assess crop production outputs, labor demands, and farm household analysis, while incorporating farmer participation in an effort to introduce conservation agriculture practices into village communities.