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Category	: International Rice Research Conference
Select Theme	: Sustainable and equitable farming systems
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Keyword 1	: Sustainable management practices
Keyword 2	: Mechanization
Keyword 3	: Weed management
Title of Entry	: Reducing the rice yield gap through alternate crop establishment methods and integrated weed management in Odisha
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Select only one type of presentation	: 15 minute oral presentation
Abstract	: Odisha is an agrarian Indian state where rice occupies 67% of the total cropped area and plays a significant role in state food security. The manual transplanting and beushening (broadcasting followed by cross plowing using bullocks at 35-40 days after sowing) are the traditional methods of rice establishment in Odisha. But, these practices make crop cultivation tedious, low yield and more expensive due to higher inputs (labor, seeds, water). To address these issues, CSISA (http://csisa.org/) evaluated alternative crop establishment methods such as drill sown direct seeded rice (DSR) and mechanical transplanted rice (MTR) in

farmers' fields in four districts in Odisha. The result from last two year trials shows that rice yield was significantly higher in MTR (higher by 0.77t/ha) compared to manual transplanting. Similarly, rice yield was higher by 0.53 t/ha in DSR (n=54) compared to beushening (n=45). The analytics from rice crop cut also shows that rice yield was 0.22t/ha higher in MTR (n=130) than manual transplanting (n=167) and 0.57 t/ha higher in DSR (n=98) compared to beushening (n=56). However, high weed infestation in direct seeding impede its scaling, and the success of DSR depends upon the weed management in general. Hence, field trials were conducted in evaluating the different weed management practices in direct seeding. When new herbicide molecules integrated with hand/mechanical weeding, rice yield was increased by 7-12%, cost of weed management decreased up to 78 % and net income increased up to 46% compared to farmer's practices of hand weeding alone. We also used Random Forest model to analyze the critical factors influencing the rice yield across the years from 2013-2017. The model predicted that the yearly monsoon/climatic variability was the most important factor influencing the rice yield, followed by district geography, verities, crop establishment method, date of sowing/transplanting, irrigation management, and nutrient management and other factors are following. We conclude that rice yield and profit can be increased with better crop establishment methods and integrated weed management practices although other climatic factors play a significant role in Odisha.

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