

A Socio Economic Analysis of Zero Tillage and Mechanical Rice Transplanter on Farm Economy in Punjab and Haryana State of India

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Abstract

Zero tillage is reducing human efforts. Likewise, machine effort is also reducing cost of cultivation, soil erosion, crop duration and irrigation requirement and weed effect which is better than tillage. Zero Tillage (ZT) is also called as No Tillage or reduced Tillage. The zero-tillage system is practiced in the Indo-Gangetic plains of India where rice-wheat cropping is present. Wheat will be planted after rice harvest. Zero tillage proves better for direct-seeded rice, maize, soybean, cotton, pigeon pea, moonbeam, cluster bean, pearl millet during Kharif season and wheat, barley, chickpea, mustard and lentil during Rabi season. A Mechanical rice transplanter is a specialized transplanter made to transplant rice seedlings onto wet paddy fields. The two main types of Mechanical rice transplanter are the riding type and walking type. The riding type is power-driven and can usually transplant six lines in one pass; the walking type is manually driven and can usually transplant four lines in one pass. Although rice is grown in Asian Country, rice transplanters are used mainly in East, Southeast, and South Asia. Machine transplanting using rice transplanters requires considerably less time and labour than manual transplanting. The Rice and Wheat cropping system in Punjab and Haryana led to various farm experiments and encouraged the farmers to adopt Resource conserving Technology (RCTs), like Mechanical Rice Transplanter and Zero Tillage methods to be adopted by farmers.

Keywords: *RCT Resource Conserving Technology, ZT Zero Technology, CIMMYT International Maize and Wheat Improvement Center, KVK Krishi Vigyan Kendra,*

Introduction

According to Madhu Kiran Tumma and K S V Poorna Chandrika (2018) Zero tillage is the process where the crop seed and fertilizers will be sown through drillers without prior land preparation and disturbing the soil where previous crop stubbles are present. Zero tillage not only reduces the cost of cultivation, it also reduces the soil erosion, crop duration and irrigation requirement and weed effect which is better than tillage. Zero Tillage (ZT) also called No Tillage or Nil Tillage.

Harold M. Schmeck (1987) states that A Mechanical rice transplanter is a specialized transplanter fitted to transplant rice seedlings onto wet paddy fields. The two main types of Mechanical rice transplanter are the riding type and walking type. The riding type is power-driven and can usually transplant six lines in one pass; the walking type is manually driven and can usually transplant four lines in one pass. Although rice is grown in Asian Country rice transplanters are used mainly in East, Southeast, and South Asia. Machine transplanting using rice transplanters requires considerably less time and labour than manual transplanting. The main objectives is to study Socio Economics of rice and wheat cultivation in Punjab and Haryana.

Research Methodologies

Primary data is collected from two states, Punjab and Haryana. Two districts from each district were selected for data collection. Survey methods were followed with a view to understanding Socio Economics of rice and wheat cultivation. For analyzing various aspects of economics of rice and wheat cultivation (adopter v/s non-adopters), tabular analysis was carried out.

Result

Following tables show the results of the survey. Each table is followed by discussion.

Table 1.0 SAMPLE HOUSEHOLD SIZE IN STUDY AREA

SAMPLE CHARACTERISTICS	HARYANA	PUNJAB	TOTAL
DISTRICTS SURVEYED	02	02	04
BLOCKS SURVEYED	13	10	23
VILLAGES SURVEYED	46	38	84
ADOPTERS SURVEYED	130	130	260
NON ADOPTERS SURVEYED	272	272	544
FARM HOUSE HOLDS SURVEYED	402	402	804

Two states Punjab and Haryana is selected for primary data collection. Because farmers have used both technologies for rice is Mechanical rice transplanter and wheat is zero tillage for cropping pattern in rabbi and kharif season. Two Districts of Haryana and Punjab is selected randomly on the basis of information share by Director Extension Education Punjab Agricultural University Ludhiana and

Chaudhary Charan Singh Haryana Agricultural University Hisar. In Haryana District Karnal and Sonipat selected for primary data collection in consultation with Krishi Vigyan Kendra of Chaudhary Charan Singh Haryana Agricultural University, Hisar. In Punjab District Moga and Ludhiana selected for primary data collection in consultation with Krishi Vigyan Kendra of Punjab Agricultural University, Ludhiana. 13 Blocks and 46 Villages were selected for 130 adopters and 272 Non adopters primary data collections in two districts of Haryana. 10 Blocks and 38 Villages were selected for primary data collection for 130 adopters and 272 Non adopters in two districts of Punjab. All Total 804 farm households Data collection completed from 402 in Haryana and 402 in Punjab.

Table 1.1 SAMPLE HOUSEHOLD SIZE OF ADOPTERS AND NON ADOPTERS IN STUDY AREA

STATES	HARYANA		TOTAL	PUNJAB		TOTAL	ALL TOTAL
DISTRICTS	KARNAL	SONIPAT		LUDHIANA	MOGA		
ADOPTERS	65	65	130	65	65	130	260
NON ADOPTERS	137	135	272	135	137	272	544
FARM HOUSE HOLDS	202	200	402	200	202	402	804

Two Districts were selected Karnal and Sonipat from Haryana and Two Districts were selected Moga and Ludhiana from Punjab for primary data collection. 65 Adopters farmers from Karnal and Sonipat districts Total 130 adopters farmers of Haryana. 65 Adopters farmers from Moga and Ludhiana districts total 130 Adopters farmers of Punjab. For Non Adopters 202 in Karnal and 200 in Sonipat Districts of Haryana and 200 in Ludhiana and 202 in Moga Districts of Punjab. All Total 804 Farm Household in both districts of 272 in Haryana and 272 in Punjab.

Table 1.2 SAMPLE HOUSEHOLD SIZE OF HARYANA IN A STUDY AREA

STATE	DISTRICTS	BLOCKS	VILLAGES
HARYANA	KARNAL	KARNAL, MUNAK, UNN, ASSANDH, NILOKHARI, GHARAUNDA, CHIRAO, NISSING, INDRI	CHALOPUR, KUNJPURA, RAMBHA, KARNAL, ANCHALA, IRAGANA-FARM, BHARI, SONUKHERAA, NIGADHU, PATANPURI, TARAWADI, NIDANA, GAGSINA, KALVAHERI, SHEKHPURA, GHARAUNDA, UPALI, ALIPUR-VIREN, TARAOWARI, SINGARA, BRASS, ALIPURA, GONDAR, ASSANDH, JALMANNA, SHEIKUPURA, THARI, SALARPURA, MANMATI, KATLAHERI, MURADHGHAR, RONDHALI, SHAHPURA, TARAWADI
	SONIPAT	SONIPAT, GANAUR, MUNDLANA, KATHURA	HULLAHERI, KILLAHARD, CHITANA, JOLLY, AULHANA, MAWHANA, GORHWAL, CHIDANA, MARDDHANA, DATULI, SHAHPUR TAGA, KHERI TAGA

In Haryana two Districts are Karnal and Sonipat selected for primary Data Collection on the basis of information provided by concerned KVK and CCS Haryana Agricultural University Hisar. In Karnal Districts 9 Blocks are selected were Karnal, Munak Unn, Assandh. Nilokheri, Gharaunda, Chirao, Nissing, Indri and 34 Villages are Chalopur, Kunjpura, Rambha, Karnal, Anchala, Iragana-Farm, Bhari, Sonu-Khera, Nigadhu, patanpuri, Tarawadi, Nidana, Gagsina, Kalvaheri, Shkpura, Gharaunda, Upali, Alipur-Viren, Taraowari, Singara, Brass, Alipura, Gondar, Assandh, Jal-Manna, Sheikpura, Thari, Salarpura, manmati, Katlaheri, Muradghar, Rondhali, Shahpura and Tarawadi etc. In Sonipat District 4 Blocks Sonipat, Ganaur, Mundalana and Kathura 12 Villages Hullaheri, Killahard, Chitana, Jolly, Aulhana, Mawhana, Gorhwal, Chidana, Marddhana, Datuli, Shahpur-Taga, Kheri-Taga etc. All Total 13 Blocks and 46 Villages.

Table 1.3 SAMPLE HOUSEHOLD SIZE OF PUNJAB IN A STUDY AREA

STATE	DISTRICTS	BLOCKS	VILLAGES
PUNJAB	LUDHIANA	LUDHIANA-I, MANGAT, DORAHA, SAMRALA, MACHHIWARA	RAHIMABAD-KHURD, MANNEWALA, PAL-MAJRA, RAJEWALA-RAJPUT, NAISAL-KALAN, BORASLA-KALAN, DIWALA, SANGATHPURA, BARTHALA, POWAT, MAJ, MAJRI, ISSEWAL, JHAMMAT, BIRMI, AALIYA- KALAN, DAKHA, CHAK-KALIYAN, DHANAUR, GARHI-BAT, HARI-OM-KHURD, JOARWAL, GHARKHANA, BONDAL
	MOGA	MOGA-I, NIHAL SINGH WALA, BHAGA PURANA, AJITWALA, KOT- ISSE-KHAN	BHADUWWAL, JINDARA, CHAK-JINDARA, CHAK-KANNIYAN- KALAN, DABURJI, JHANDEWAL, KOKRI-PHULLA-SINGH, CHAK- KHANNIYA, KAMAI—KE, IZZATWALA, TAREWALA, CHARIK- SARKARIPATTI, GAZIANA, BADHNI-KALAN

In Punjab two Districts are Ludhiana and Moga selected for primary Data Collection on the basis of information provided by concerned KVK and Punjab Agricultural University Ludhiana. In Ludhiana District 5 Blocks are Ludhiana I, Mangat, Doraha, Samrala, and Machhiwara and 24 Villages are Rahimabad-khurd, Mannewala, Pal-majra, Rajewala-Rajput, Naisal-Kalan, Borsalan-Kalan, Diwala, Sangathpura, Barthala, Powat, Maj, Majri, Issewal, Jhammat, Birmi, Aaliya-Kalan, Dakha, Chak-Kaliyan, Dhanaur, Garhi-Bat, Hari-Om-Khurd, Joarwal, Gharkhanna, Bondal, etc. In Moga District 5 Blocks are Moga-I, Nihal-Singh-wala, Bhaga-Purana, Ajitwala, Kot-Isse-Khan, etc. 14 villages are Bhadduwal, Jindara, chak-jindara, Chak-jindara, Chak-Kanniya-kalan, Daburji, Jhandewal, Kokri-Phulla-Singh, Chak-kanniya, Kamal-Ke, Izzatwala, Tarewala, Charik-Sarkari-Pati, Gaziana, Badhani-Kalan, etc. A total of 10 Blocks and 38 Villages.

Conclusion

Two Districts were selected Karnal and Sonipat from Haryana and Two Districts were selected Moga and Ludhiana from Punjab for primary data collection. 65 Adopters farmers from Karnal and Sonipat districts Total 130 adopters farmers of Haryana. 65 Adopters farmers from Moga and Ludhiana districts total 130 Adopters farmers of Punjab. For Non Adopters 202 in Karnal and 200 in Sonipat Districts of Haryana and 200 in Ludhiana and 202 in Moga Districts of Punjab. All Total 804. Farm Household in both districts of 272 in Haryana and 272 in Punjab. Primary Data collection and compilation in Punjab and Haryana is completed in 2022. The Technology innovations played important role in advancements and upgradation of existing one the way Zero tillage into happy seeder and Super seeder its

transformation to enhancements in Farm productions and livelihood. The Rice and Wheat cropping system in Punjab and Haryana led to various farm experiments encouraged the farmers to adopt Resource conserving Technology (RCTs) like Mechanical Rice Transplanter and Zero Tillage methods to be adopted by farmers. Due to Covid 19 Pandemic in 2020 leads to problems of labour scarcity in Punjab and Haryana for Rice and wheat cropping system. These two technologies are helpful to farmers to handle such situation of Lockdown imposed for two Years in India. Punjab and Haryana Government provides subsidy to farmers for purchasing Zero tillage and their advancement Happy Seeder and Super Seeder and also Mechanical Rice Transplanter to Farmers. It is also encouraging farmers to purchase such Machinery for their wellbeing. CYMMIT India provides these two machineries on custom hiring basis to farmers and also provides on farm trials or demonstrations to farmers to encourage them to do so. Badduwal Village under Kot-Isse-Khan Block in Moga is role model village in Punjab because it is having highest number of Farmers adopting both these technology. Around 646 small and Marginal Farmers adopted these two technologies with total cultivable Land of 2800 Acres. The village has more than 90% area under the Rice-Wheat System. Also farmers are benefited with these two technologies in increasing their farm productions and enhanced livelihood.

Suggestions and Policy Implications.

Zero tillage and Mechanical rice Transplanter is to be given to farmers for custom hiring basis and also subsidy to be provided by all state government to farmers, so that more and more farmers will use these technologies for Rice and Wheat cropping system in other states of India.

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