



How Good Are Survey Measures Of Agricultural Productivity?

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Introduction

Labor Outmigration, Agriculture Productivity and Food Security

Struggle among agriculture scientists with accurate crop yield estimation

Rice Yield Estimation

Crop Cutting Experiment: method used to estimate crop yields (physical harvest) of a location

Survey Method: method used to estimate the harvest by administering relevant questions



Objective

- To compare productivity estimated from survey measures to that from the experimental crop cutting



Datasets

Data Collection Activities	Season 1		Season 2		Season 3		Season 4		Season 5	
	Com #	RR %	Com #	RR %	Com #	RR %	Com #	RR %	Com #	RR %
Seasonal Agri. & Remittance	2208	99.7	2197	99.2	2187	99.1	2183	98.9	2171	98.5

Crop Cutting						
Name of Crops	Time One			Time Two		
	Total Sample	Not Eli.	Crop Cutting	Total Sample	Not Eli.	Crop Cutting
Rice	700	167	524	686	188	485
Mustard	331	128	196	352	79	266
Lentil	270	117	149	242	55	184
Wheat	350	234	114	215	68	142
Maize	342	97	241	339	125	208



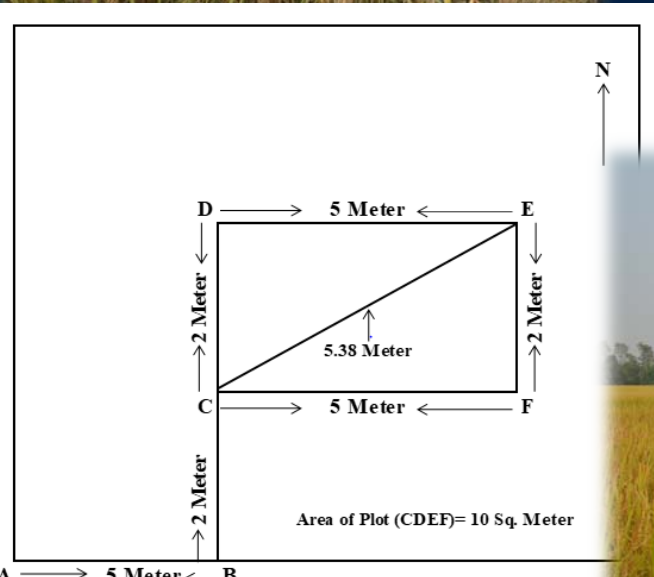
Data and Sample

- Crop selected: Paddy
- Observation Period : 2015-16 (Sept-Jan)
- Number of Households growing paddy in Baseline Survey (within neighborhood): 1435
- Sample for crop cutting:
 - Sample selected: 700 (considering ineligibility)
 - Number of crop cutting samples collected: 522
- Final HH number after Data Merged and Cleaned: 495



Data Collection Method: Crop Cutting

Prof. Dr. LP Amgain



Data Collection Method: Survey

- Survey
 - Questionnaire
 - Farming (Y/N), Crop planted, Land area planted, Harvest amount and others





Study Design

SURVEY

Standard Survey method/
Questionnaire

Farming, Crops planted, land area currently planted/ last 4 months, harvest quantity

Productivity in tons per hectare

EXPERIMENT (Crop Cutting)

Standard experimental Design

Moisture and weight of the crop harvested from experimental 5*2 m² plot

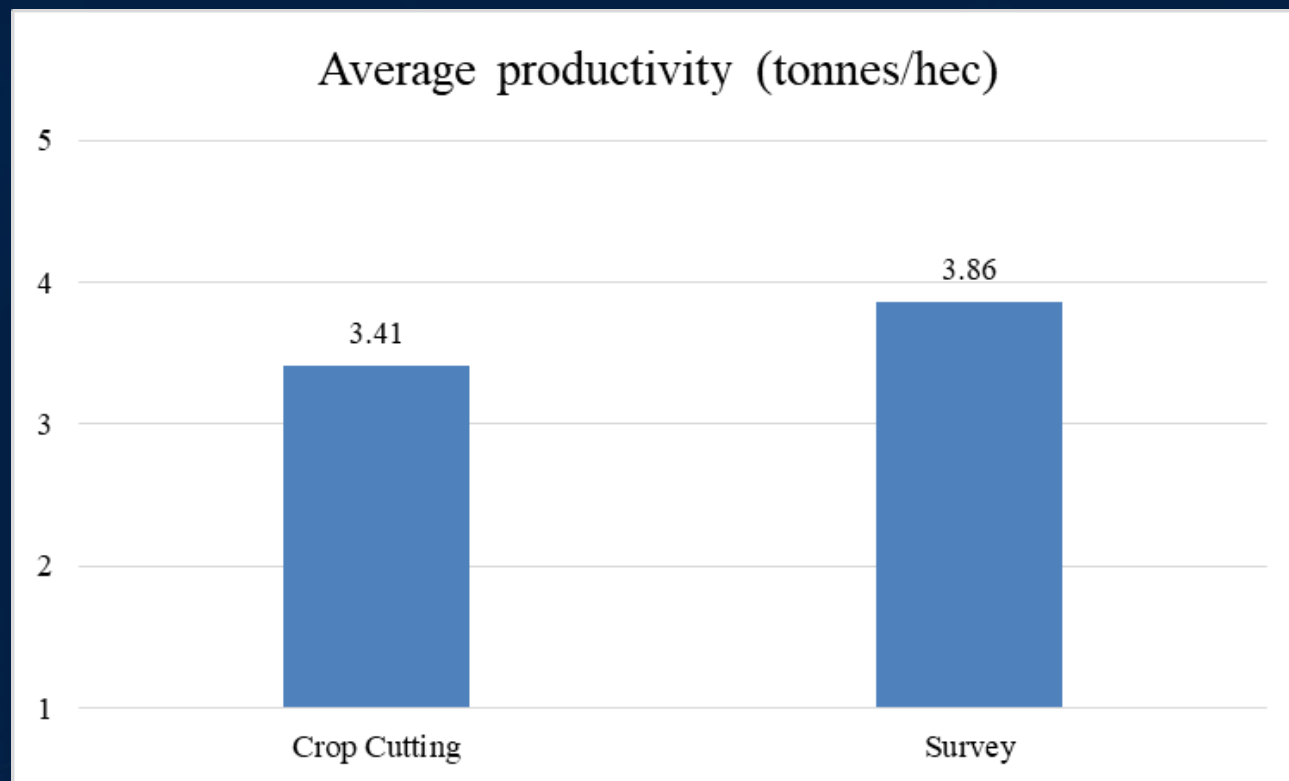
Productivity in tons per hectare @ 14% moisture correction

H_0
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Difference between productivity

- Average difference= -0.45 tonnes per hectare** (CC-Survey)
- Correlation coeff= 0.274





Analytical Approach

Outcome: Difference in productivity

Explanatory factors:

Interview Characteristics: *Age of respondent, Gender, Time of report*

HH Characteristics: *Landholding, Own livestock (large animals), remittance received*

Physical Characteristics: *Irrigation, Variety Type, Buy seed*

Unit of analysis: Households



Descriptive (N=495)

Measures	Mean	St.Dev	Min	Max
Difference in productivity (tonnes/hectare)	-0.45	1.29	-5.23	3.06
IW Characteristics				
Age of respondent (years)	45.62	13.97	18.00	86.00
Gender of respondent (1=Female)	0.71	-	-	-
Reporting next season (1=Yes)	0.47	-	-	-
Household Status				
Landholding (hectare)	0.44	0.50	0.00	3.33
Own Livestock (1= Yes)	0.63	-	-	-
Remittance received (1= Yes)	0.47	-	-	-
Physical Characteristics				
Irrigation (1= Yes)	0.75	-	-	-
Hybrid Variety (1= Yes)	0.13	-	-	-
Buy seed (1= Yes)	0.58	-	-	-



Regression

Variables	Model 1	Model 2	Model 3	Model 4
<i>IW Characteristics</i>				
Age of respondent (years)	0.009*			0.008^
Gender of respondent (1=Female)	0.178			0.220
Reporting next season (1= Yes)	-0.261*			-0.269*
<i>Household Status</i>				
Landholding (hectare)		0.152		0.131
Own Livestock (1= Yes)		-0.057		-0.098
Remittance received (1= Yes)		-0.041		-0.035
<i>Physical Characteristics</i>				
Irrigation (1= Yes)			0.017	0.051
Hybrid Variety (1= Yes)			-0.337*	-0.274
Buy seed (1= Yes)			-0.201^	-0.245*
Intercept	-0.586^	-3.911**	-2.221**	-2.259*
Model F	3.372*	0.577	2.508^	2.172*
Regression Degree of Freedom	3	3	3	9
Residual Degrees of Freedom	491	491	491	485
Adjusted R-square	0.014	-0.003	0.009	0.021



Conclusion and Way Forward

- Interview Characteristics such as “Time interviewed” or age of the respondent seem to significantly explain the difference in productivity
- Only 2.1% variation is explained with some variables taken into account
- Yet work in progress
- Probable:
 - If people reported total amount harvested or amount they kept
 - Any other variables??



THANK YOU