

APPENDIX

I. Methods to Estimating Average Productivity and Marginal Value Product of Inputs

A. Average productivity of inputs

Average productivity of inputs in this study was calculated as

$$Y_t/X_{it}$$

Where Y_t stands for total value of crop production in year t , X_{it} is for the applied level of input i in the same year t .

B. Marginal value product (MVP) of input

Marginal value product of input was estimated by using estimates of Restricted Translog production function model (6) and average productivity of input calculated above. The derivation of formula for MVP are as follows:

$$a_{it} = \partial \ln Y / \partial \ln X_i$$

$$= \partial Y / Y / \partial X_i / X_i \quad \text{rearrange this equation}$$

$$\partial Y / \partial X_i = a_{it} (Y / X_i)$$

$\partial Y / \partial X_i$ is the MVP of input i in year t , a_{it} is the production elasticity of input i in year t , Y / X_{it} is the average productivity of input i in year t .

II. Descriptive Statistics of Relevant Variables Used in This Study

Variable	Mean	Std. Dev.	Skewness	Kurtosis	Minimum	Maximum
Output	.22797E+06	68000	.666	2.066	.1427E+06	.3638E+06
Labor	.84114E+07	.26647E+07	1.176	4.365	.4565E+07	.1712E+08
Land	.4289	292.32	.129	2.580	3722	4974
Cfert.	.35773E+06	.1619E+06	.527	1.926	.1230E+06	.6658E+06
Mfert.	.35937E+06	55322	.348	2.989	.2481E+06	.4933E+06
Time	21.083	11.198	-155	1.889	1.000	39.000

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