JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

Doctoral Program in Agricultural Economics and Related Sciences

Deutscher Tropentag 2007, October 9-11, in Witzenhausen

Efficiency analysis of wheat producing farms in Tashkent region, Uzbekistan

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INTRODUCTION

After achieving independence, agricultural policy of Uzbekistan mainly concentrated on 2 objectives. One of them is to achieve self-sufficiency in grain production. In agriculture reforming it was chosen the path based upon restructuring of agricultural enterprises to fulfil this goal and establish new type of farm – private. The agricultural land was given to rent through competition to private farms. Nowadays the big group of grain producers are private farms. They are completely free in their activities according to the law, but they are severely constrained in practice.

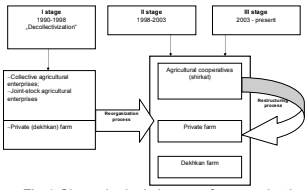

Fig.1 Chronological change of reorganization agricultural enterprises.

OBJECTS

- estimate technical and allocative efficiency performance of wheat producing private farms;
- determinate factors effecting in efficiency

FIELD SURVEY

- Tashkent region, Uzbekistan
- 44 wheat producing private farms for 2004-2005;
- random sampling technique;

METHODOLOGY

For estimation of efficiency measures were included observations on input used (man-days of labour, fertilizer per kilogram, machinery hours) and farm characteristics (such as age of farmers, years of education and experience, household size, machinery availability). In the study efficiency estimation under constant return to scale by employing input-oriented DEA was used:

$$\min \ \theta_o, \lambda_j$$

$$st: \sum_{m=1}^{n} y_{jm} \lambda_m \geq y_{j0}, \ j = 1,\ldots, \ k$$

$$x_{i0}\theta_0 - \sum_{m=1}^{n} x_{im} \lambda_m \geq 0, i = 1,\ldots, \ I$$

$$\lambda_m, x_i \geq 0, \ m = 1,2,\ldots, \ n$$

The second stage, regression can be used to explain the efficiency scores for the various firm-specific factors as to identify the factor affecting technical efficiency from the DEA results. In this study Tobit regression was used to identify factors associated inefficiency:

TEi=α + β1AGEi + β2HHi + β3EDUCi + β4EXPi + + β5FSi+ β6MACHLABRi + β7PRLANDRi + β8FERTLANDRi + β9FUELANDRi +εi

Table 1: **Descriptive statistics .**

Variable	Definition	Mean	St.d.
HHSZ	Household size, person	7,04	1,70
FARMSZ	Farm size, ha	17,43	8,72
AG	Age of farmer, years	57,25	8,63
FLMD	Family labor, mann-days	474,55	190,10
HLMD	Hired labor, mann-days	128,72	50,47
PROD	Total production, kg	55213,63	28245,95
FUEL	Fuel, liters	909,43	640,08
FERT	Fertilizer, kg	5338,63	3422,39
SEED	Seeds, kg	3615,45	1822,22
MACH	Machinery, hours	393,27	77,44

RESULTS

Fig.2 Technical and allocative efficiency of wheat producing private farms

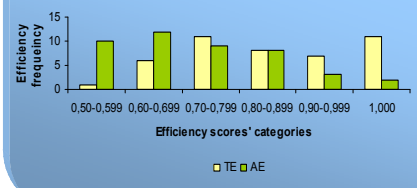

Fig.3 Shares of wheat producing farms operating under CRS, IRS and DRS (2004-2005)

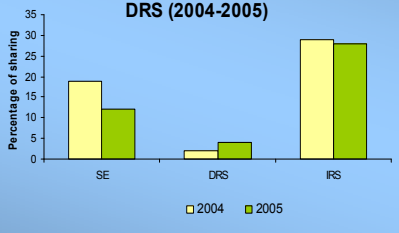

Table 2: **Relationship among technical efficiency, inputs and farms characteristics .**

Independent variables	Coefficient	Std. err.	T-ratio	P-value
Constant	18,5648	278,3839	0,067	0,9468
Age (AG)	2,3007	3,6518	0,63	0,5287
Household size (HHS)	0,9935	12,052	0,082	0,9343
Education (EDU)	-30,4903	23,895	-1,276	0,202
Year of Farming Experience (EXP)	4,0458	3,6207	1,118	0,2634
Farm size (FS)	2,929	2,5877	1,132	0,2577
Machinery Labor Ratio (MACHLABR)	-162,4632	110,7648	-1,467	0,1424
Production Land Ratio (PRLANDR)	0,7094	0,6089	1,165	0,244
Fertilizer Land Ratio (FERTLANDR)	0,682	0,2995	0,228	0,8199
Fuel Land Ration (FUELANDR)	-6,1487	2,584**	-2,379	0,0174
Log-L	-274,5763			

Note: "," and "" denote significance at 1%, 5% and 10% level, respectively

CONCLUSIONS

Within the limitations of the data availability, it has been able to identify and estimate technical and allocative efficiency and the factors determining technical efficiency among the wheat producing farms. On the average wheat producing farms could reduce input use by 20% and produce the same volume of output. Among factors that have significant impact of use fuel per hectare. This outcome thus suggests that right proportion use of inputs is important variable to be considered seriously for farmer and policy-makers. Most important is to create long-term programs, which could help to improve machinery availability for farmers, as investment into fleets of machinery and tractors.

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