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(Data Envelopment Analysis)

(TEvrs)

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Data Envelopment

Analysis (DEA)

Data

Envelopment Analysis(DEA)

: (Afriat, 1972; Coelli, 1996)

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DEA :DEA Model (CRS)

$$EE_i = \frac{W_i X_i}{W_i^* X_i^*} \quad (3)$$

(AEi)

$$AE_i = \frac{EE_i}{TE_i^{CRS}}$$

DEA Model (VRS)

$$\begin{aligned} & \text{Min}_{\theta, \lambda} \theta_i^{VRS} \quad (5) \\ & Y\lambda - y \geq 0 \quad \text{s.t.} \\ & \theta_i - X\lambda \geq 0 \quad i = 1, 2, \dots, N \\ & N' \lambda = 1 \quad \lambda \geq 0 \end{aligned}$$

(Seiford, 2004) **Scale Efficiency**

VRS & CRS

CRS

DEA

$$\begin{aligned} & \text{Max}_{\theta, \lambda} \theta_i^{CRS} \quad (1) \\ & \text{s.t. } Y\lambda - y \geq 0 \\ & \theta_{X_K} - X\lambda \geq 0 \\ & K = 1, 2, \dots, n \\ & \lambda \geq 0 \end{aligned}$$

(TE)

N x1

$$\theta \leq 1$$

$$\begin{aligned} & \text{Min}_{\theta} \theta_i^{CRS} W_i X_i^* \quad (2) \\ & Y\lambda - y \geq 0 \quad \text{s.t.} \\ & \text{where } \lambda \geq 0 \\ & X\lambda \geq X_i^* \end{aligned}$$

$$\theta \leq 1$$

$$\theta = 1$$

$$\theta_i$$

$$\theta_i^{CRS}$$

i

i

K

X

Y

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-:

N x1

λ Y

& VRS DEA

CRS & VRS

DEA

$$Se_i = \frac{TE_i^{CRS}}{TE_i^{VRS}}$$

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$$Se_i = 1$$

$$Se_i < 1$$

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جدول رقم ٧: مقارنة الاستخدام الفعلي والأمثل لاستخدام أهم الموارد الاقتصادية بمزارع عينة الدراسة لإنتاج الأسماك بمنطقة جنوب بورسعيد

الفئات	مقايير		التقسيم العضوي		التقسيم الكيماوي		العمالة الفنية		العمالة العادية		ساعات العمل الأمل	
	الأمثل	الفعلي	الأمثل	الفعلي	الأمثل	الفعلي	الأمثل	الفعلي	الأمثل	الفعلي		
الفئة الأولى مزارع مساحتها ٣٠-٢٥ فدان	٢٩	٥٠,٢٨	٣٠	١٣٤	٣٠,١٤٠	٤٣٥,٠٠٠	٤٢٧٢٤١	١٨١٣	١٧٨١	٨٩٩	٨٧٩	١٣٩٨
المتوسط	٢٩	٥٠,٢٨	٣٠	١٣٤	٣٠,١٤٠	٤٣٥,٠٠٠	٤٢٧٢٤١	١٨١٣	١٧٨١	٨٩٩	٨٧٩	١٣٩٨
أقصى قيمة	٣٠	٦,٢٩	٣٠	١٤٤	٦,١٤٦	٤٥٠,٠٠٠	٤٤٣٧٩٣	١٨٧٥	١٨٥٠	٩٣٠	٩١٧	١٤٥٢
أدنى قيمة	٢٥	٢٥	٢٥	١٢٣	١٢٣	٣٧٥,٠٠٠	٣٧٥,٠٠٠	١٥٦٣	١٥٦٣	٧٧٥	٧٥٥	١٢٢٧
الفئة الثانية مزارع مساحتها ١٠ فدان	١٠	٨٤,٩	١٠	٤٥٣	٥١,٢	١٥٠,٠٠٠	١٣٥٤٩٩	٦٨٨	٦٨٨	٣١٠	٣٠٥	٤٤٧٩
المتوسط	١٠	٨٤,٩	١٠	٤٥٣	٥١,٢	١٥٠,٠٠٠	١٣٥٤٩٩	٦٨٨	٦٨٨	٣١٠	٣٠٥	٤٤٧٩
أقصى قيمة	١٠	٩١,٩	١٠	٥٦	٥١,٥	١٥٠,٠٠٠	١٤٨٣٧٩	٦٨٨	٦٨٨	٣١٠	٣١٠	٤٨٧
أدنى قيمة	١٠	٧٢,٩	١٠	٥٢	٥٠,٥	١٥٠,٠٠٠	١٤٥٨٣٣	٦٨٨	٦٦٩	٣٠١	٣٠١	٤٧٧
الفئة الثالثة مزارع مساحتها ٥ فدان	٥	٩٥,٤	٥	٢٨	٢٨	٧٥,٠٠٠	٦٧٦١٢	٣٦٨	٣٦٨	١٥٥	١٥٣	٢,٧٩
المتوسط	٥	٩٥,٤	٥	٢٨	٢٨	٧٥,٠٠٠	٦٧٦١٢	٣٦٨	٣٦٨	١٥٥	١٥٣	٢,٧٩
أقصى قيمة	٥	٨٩,٤	٥	٣٠	٢٨	٧٥,٠٠٠	٧٥,٠٠٠	٣٧٥	٣٧٥	١٥٥	١٥٥	٢,٧٩
أدنى قيمة	٥	٩٢,٠	٥	٢٧	٢٧	٧٥,٠٠٠	٧٣٦٥٧	٣٤٤	٣٦٩	١٥٥	١٥٢	٢,٧٩
الفئة الرابعة مزارع مساحتها فدان	١	٩٢,٠	١	٧	٧	١٥٠,٠٠٠	١٣٨٢٤	٨٦	٨٦	٣١	٣١	٥,٧٦
المتوسط	١	٩٢,٠	١	٧	٧	١٥٠,٠٠٠	١٣٨٢٤	٨٦	٨٦	٣١	٣١	٥,٧٦
أقصى قيمة	١	٨٩,٠	١	٦	٦	١٥٠,٠٠٠	١٣٣٥٣	٧٥	٧٨	٣١	٣١	٥,٧٦
أدنى قيمة	١	٨٩,٠	١	٦	٦	١٣٣٥٣	١٣٣٥٣	٧٥	٧٨	٣١	٣١	٥,٧٦

المصدر : جمعت وحسبت من تخطيط البيانات الواردة بإستثمار الإستبيان.

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- Afriat, P. (1972). Efficiency estimation of production functions. *International Economic Review* **13**: 568-598.
- Charnes, A., Cooper W. W., and Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operations Research* **2**: 429-444.
- Coelli T. J., (1996). A Guide to DEAP Version 2.1: A Data Envelopment Analysis (Computer) Program. CEPA Working Paper 96/08, Department of Econometrics, University of New England. Armidale.
- Coelli, T. J., and Perelman S., (1999). A Comparison of Parametric and Non-parametric Distance Functions: with application to European Railways. *European Journal of Operational Research*, **117**: 326-339.
- Farrell M. J., (1957). The measurement of productive efficiency. *Journal of the Royal Statistical Society A* **120**: 253-290.
- Seiford L., Cooper W., and Joe Zhu (2004): *Handbook on Data Envelopment Analysis*. Boston, Kluwer's.

Estimate The Efficiency of Fish Farm Production in South Port Said Region Using Data Envelopment Analysis

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ABSTRACT

Fish production increased in Egypt from 724.4 thousand tons in 2000 to reach 1.4 million tons in 2011, represents the most important production of animal protein, also increased the relative importance of fish farming from 47% to 72%. Which called attention to estimate the efficiency of the use of economic resources in the production of fish farms in Port Said region.

The results of the study showed that technical competence and in accordance with the concept of variable earnings capacity (TEvrs) could be worth ranged between 98 % for the fourth categories and 99 % for the first category of the largest space to signify the importance of the economies of capacity. On the contrary, marked the third category of the sample farms, and is the smallest area of the first and second, achieving the highest estimate of the economic efficiency of 99 %, followed by the first and second class by 98 %, and achieved a fourth category lowest estimate of the index of economic efficiency, 92%. These percentages reflect the optimal amount of resources compared to the actual quantities used of resources used.

The results of the study indicate that it must reduce the average area from 12.3 to 11 Fadden and achieve the same level of production. Can also reduce the average number of fry 169 to 161 thousand fingerlings, should also increase technical labor for the farm from 251 to 260 workers and reduce regular employment on the farm of 517 to 507 workers only, as well as reducing working hours ATMs from 558 to 509 hours of the farm, when you achieve these farms for the full economic efficiency.

The study recommends the importance of efficient use of factors of production and especially fry element (fingerling), can also review the technical labor and regular working hours ATMs as an indicator of techniques applied on the farm, especially after achieving technical and economic efficiency, Also need to focus development efforts and development on the fourth farm groups, which amounted to an area of Fadden, where estimates were indications the technical and economic efficiency least among the sample of the study groups.