

# Assessing the Impact of Salinity on Resource Use Efficiency in Wheat Production in Central Iraq

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# Introduction

Iraqi agricultural sector -

Food security 1950, 1960, 1970, and 1980

% Work opportunities 23.7

GDP 4.8, 4.9, and 4.6

Land of Iraq -

Million ha 43

Agricultural area 18.8%

Arable area % 9.2

.Permanent meadows and pastures % 9.5

Forest % 2

Soil salinity in irrigated area -

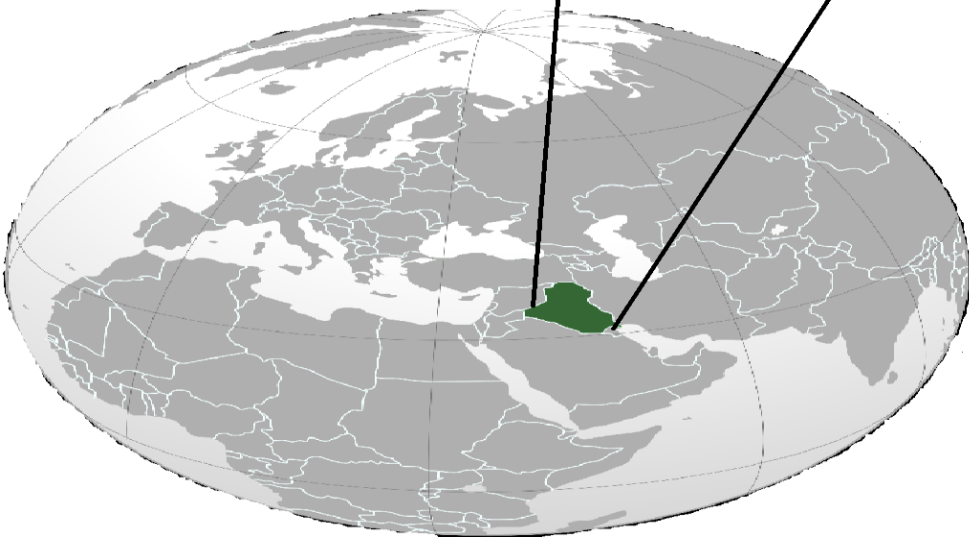
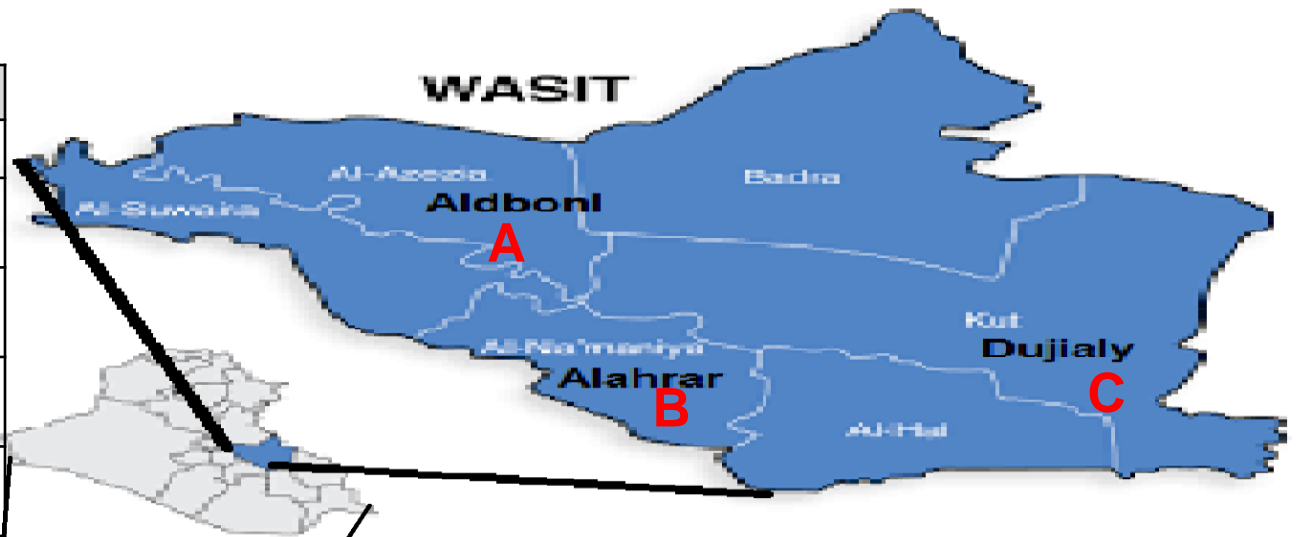
(Million ha ( Irrigated area 2

.Moderately saline % 75

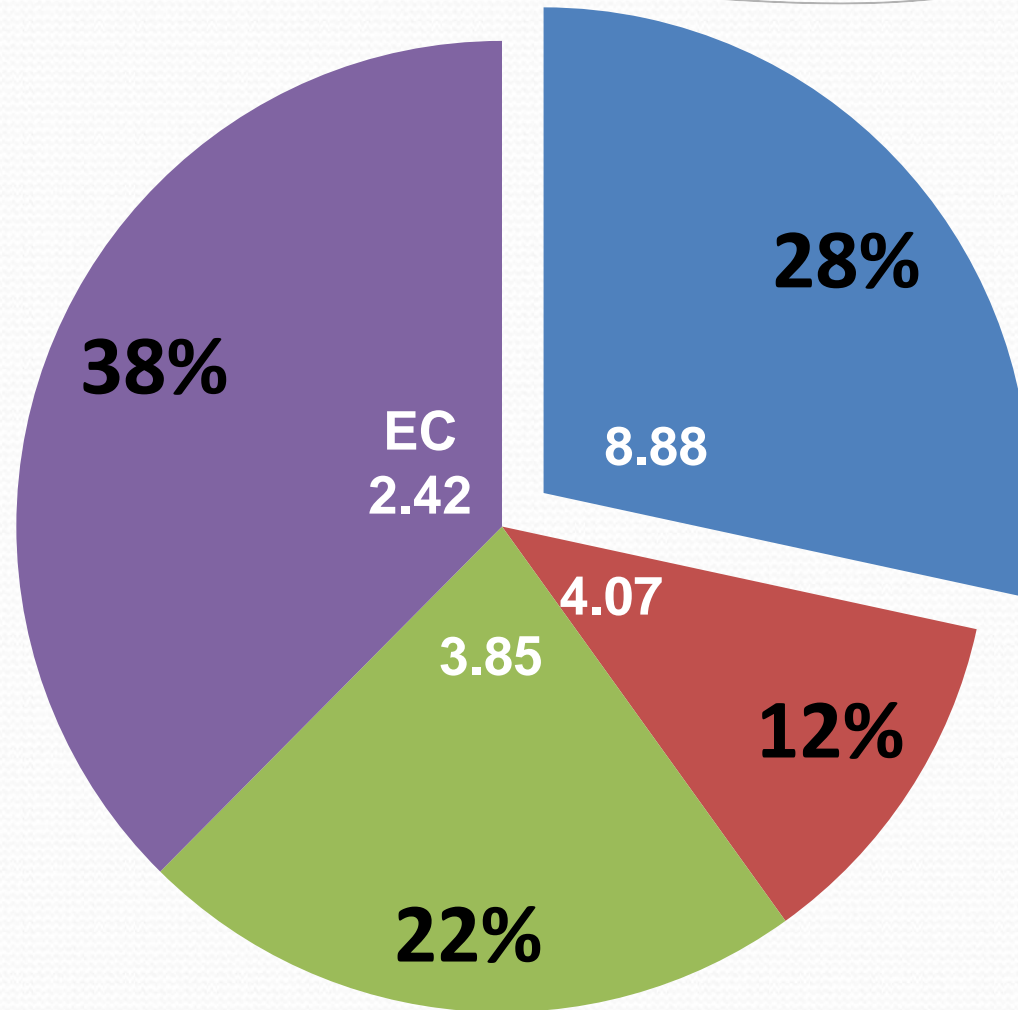
Salt-affected land % 25

# Study area

Class of area	Area ha
Uncultivable	704532
Cultivable	1058848
Reclaimed	118199
Semi-Reclaimed	37038
Un-Reclaimed	903611



# Sample Distribution based on Farm location & EC

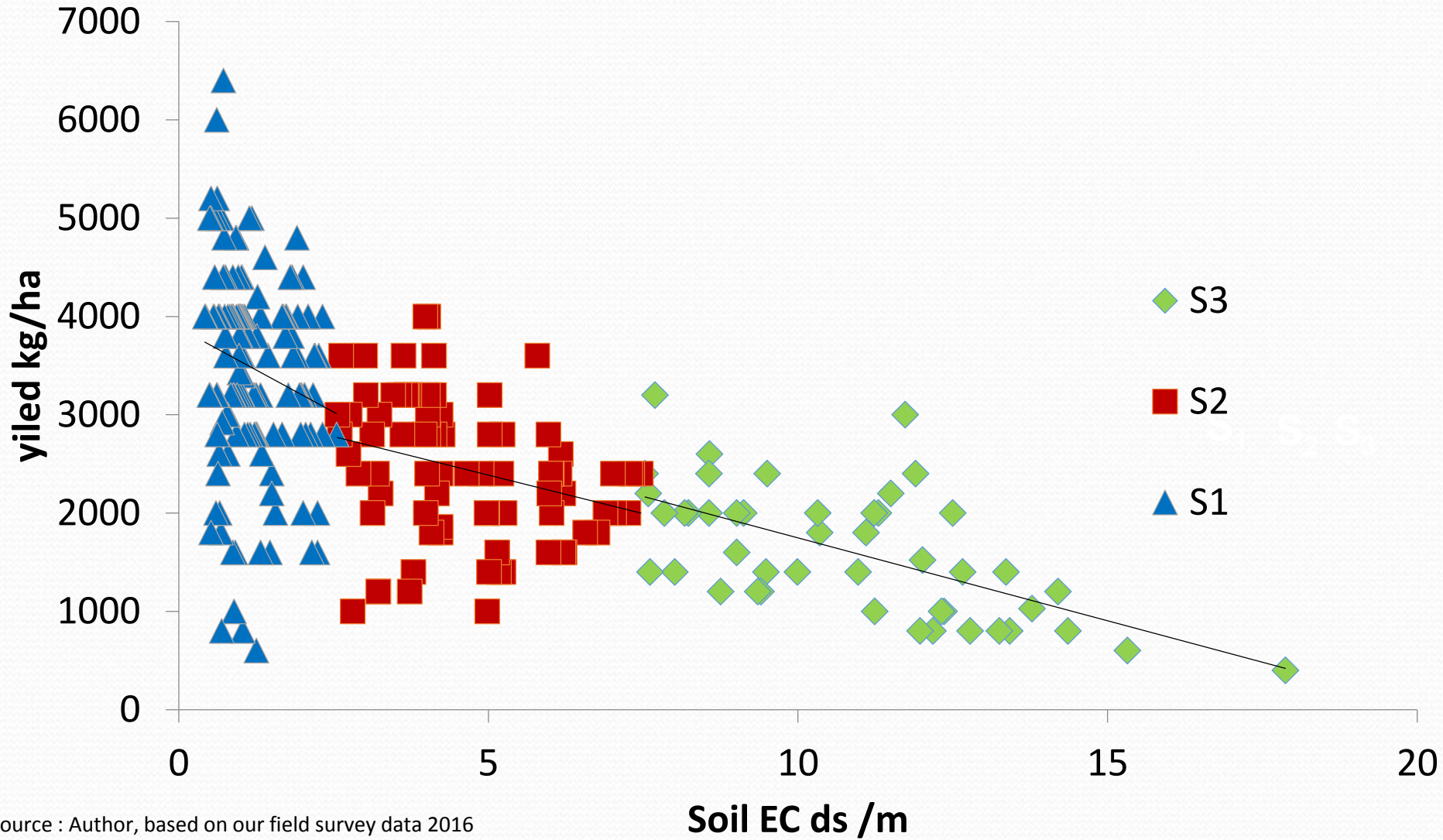


■ Unreclamation ■ Unreclamation (main river) ■ Sime-reclamation ■ Reclamation

## Mean of inputs and soil salinity

	No.Far.	EC	yield kg/ha	No. Of Irr	Agri-Ch	Fer Kg/ha	SQ kg/ha	Man-h/ha	Mech-h/ha
<b>S<sub>1</sub></b>	148	1.21	3466	4.23	1	286	244	6	7.34
<b>S<sub>2</sub></b>	79	4.45	2413	3.91	0.97	286	256	5.98	7.44
<b>S<sub>3</sub></b>	43	10.85	1576	4	1	325	253	6.12	7.6
<b>Total</b>	270	4.77	3466	4.23	1	286	244	6	7.34

# Wheat yield & Soil EC



Source : Author, based on our field survey data 2016

## CD parameters of technical efficiency estimation

	coefficient	standard-error
Constant	7.56	0.55
Ln (Number of Irrigation)	0.20***	0.08
Ln (Agri-chemical )L/ha	-0.004	0.02
Ln (Fertilizer ) kg/ha	0.09**	0.04
Ln (Seed Quantity ) kg/ha	-0.02	0.09
Ln ( Labour) Man-days	-0.02	0.06
Ln ( Mechanization) Mach-hour	0.10	0.13
Ln (EC)	-0.22***	0.02
<b>Inefficiency Variables</b>		
Soil EC level	-0.33**	0.16
Location	0.08	0.14
Position	0.00	0.00
Education Level	0.11	0.15
Agricultural Experience	-1.35***	0.44
Wheat Variety	0.18	0.27
Wheat share	0.13	0.14
sigma-squared	0.34***	0.09
gamma	0.96***	0.01

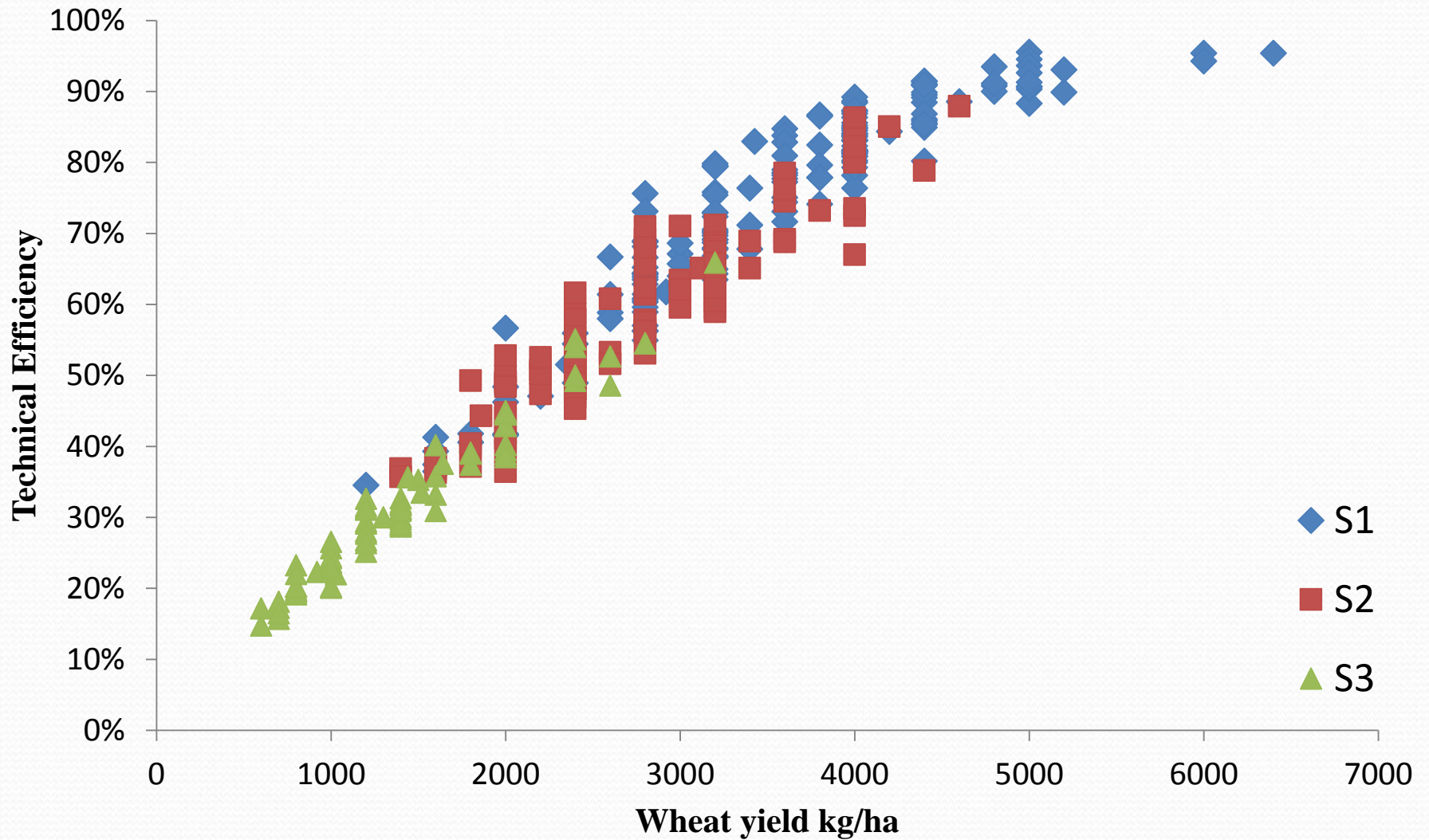
## Resource use efficiency indicators

Variables	Total Sample						r		
	APP	MPP	E	MVP	MFC	r	S <sub>1</sub>	S <sub>2</sub>	S <sub>3</sub>
No. of Irrigation	696	136.6	0.196	102417	12796	8.00	10.85	6.40	3.67
Agri. Chemical	2887	10.3	0.004	7697	31395	0.25	0.30	0.21	0.14
Fertilizer	10	0.9	0.090	658	564	1.17	1.46	0.98	0.60
Seed	11	0.2	0.015	129	886	0.15	0.18	0.12	0.08
Labour	473	10.4	0.022	7801	25000	0.31	0.38	0.27	0.17
Mechanization	382	40.0	0.105	30013	45063	0.67	0.78	0.58	0.39

Source : Author, based on our field survey data 2016



## TE and wheat yield

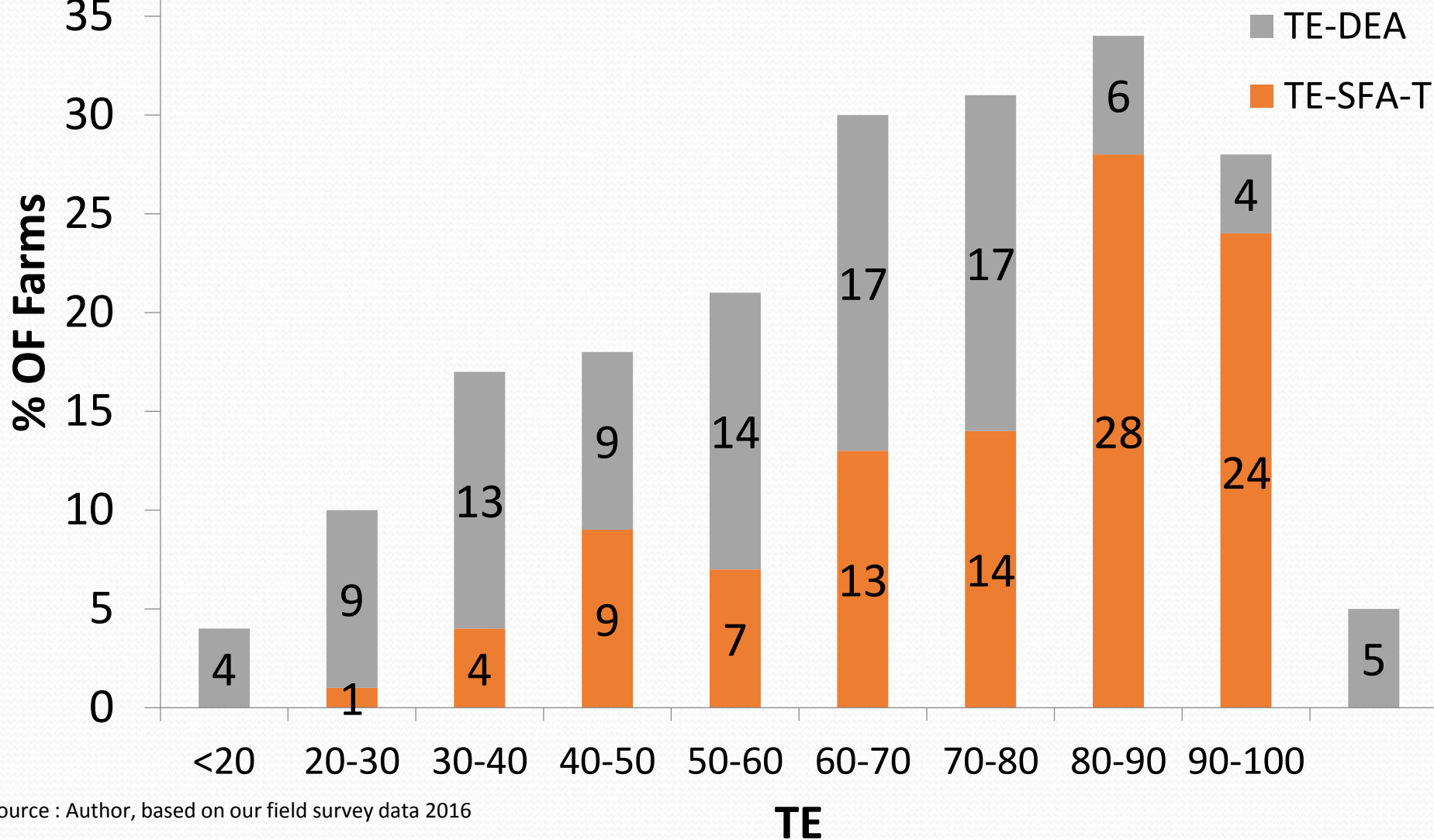


## SFA vs DEA Technical Efficiency Estimation

Soil salinity level	Average		
	TE-SFA	TE-DEA	EC
<b>S1</b>	0.77	0.68	1.21
<b>S2</b>	0.75	0.51	4.45
<b>S3</b>	0.66	0.33	10.85
Total sample	0.74	0.57	3.69

Source : Author, based on our field survey data 2016

## Percentage distribution of TE of farmer according to estimated method



Source : Author, based on our field survey data 2016

## Concluding Remarks and Implications

:Soil salinity has multi-sided impacts

The first impact is on the inputs side, in which farmers in salt-induced soil use more quantities of inputs compare with the farmers in the low salinity soil. Soil salinity causes different damages on each input. Some of these damages lead to reduce .the productivity of that input

The second impact is on the production side in which farming in high salinity land .lead to reduce wheat production by 50% in irrigated wheat system

The last impact is unaccounted ones, in which salinity has negative externalities on environment such as downstream water pollution by unabsorbed quantities of fertilizer and agricultural chemicals given their massive use by farmers to mitigate .the salinity level

Mitigate soil salinity through investment in reclaimed projects and maintenance .infrastructure in established reclaimed project

Iraqi government should rehabilitate irrigation and draining systems, and increase .price support of wheat

Additionally, reduce subsidies of overutilized inputs and increase subsidies of .underutilized inputs



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Thank You  
For  
Your Attention!

Any Questions?