



ASSESSMENT OF FARMER'S KNOWLEDGE AND PRACTICES ON  
SAFE ORGANOPHOSPHATE PESTICIDES USE IN SELECTED  
VEGETABLES FROM ILALA, DAR ES SALAAM

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# INTRODUCTION

- Fresh vegetables: vital for a balance diet & lower risk of diseases (Rekhy *et al.*, 2017)
- Pesticide rescue 100% vegetable loss cases (Kiwango *et al.*, 2018)
- Organophosphate pesticides: widely used in agriculture & pose human toxicity (Kapeleka *et al.*, 2020)
- Globally, hundreds of thousands of people die each year (Calista *et al.*, 2022)
- Vegetable farmers face risks from both dietary and occupational exposure, (Lekei *et al.*, 2014)
- Farmers' knowledge and practices in pesticide use determine vegetable safety and quality (Tessema *et al.*, 2022)



# METHODS

- **STUDY AREA**

Ilala District: Kinyerezi and Gongo la mboto wards in Dar es Salaam.

- **STUDY DESIGN**

Cross sectional study design was conducted.

- **SAMPLE SIZE**

138 farmers :  $n = Z^2 (P \times Q) / d^2$  (Charan & Biswas, 2013)

- **DATA COLLECTION:** structured face to face interview and field observations.

- **DATA ANALYSIS:** SPSS version 23 and Microsoft office excel 2016, employing descriptive statistics to summarize frequencies and means, independent t test and ANOVA to assess mean difference between groups and Pearson correlation coefficient.

# RESULTS

• TABLE 1: SOCIO-DEMOGRAPHIC FACTORS

VARIABLE		FREQUENCY	PERCENTAGE (%)
AGE OF RESPONDENTS			
	<35	32	23.36
	36-40	34	24.82
	41-45	29	21.17
	46-50	27	19.71
	>50	14	10.94
SEX OF RESPONDENTS			
	Male	80	58.39
	Female	57	41.61
MARITAL STATUS			
	Married	97	72.39
	Single	32	23.88
	Widowed	05	03.73
EDUCATION LEVEL			
	Primary education	54	39.42
	Secondary education	40	29.20
	Post-secondary education	23	16.79
	Never attended	20	14.59
YEARS OF EXPERIENCE (in years)			
	0-5	63	46.32
	6-10	56	41.18
	11-15	12	08.70
	Above 15	5	03.80
FARM SIZE (in acres)			
	0-1	124	91.18
	1-2	12	08.82
WARD			
	Kinyerezi	72	52.55
	Gongo la mboto	65	47.45



TABLE 2: KNOWLEDGE OF RESPONDENTS RELATED TO PESTICIDES USE

VARIABLE	FREQUENCY	PERCENTAGE (%)
What other types of vegetables do you grow?		
amaranth	117	85.4
Chinese	111	81.02
Sweet potato leaves	111	81.02
Other types	63	45.99
Do you encounter pests/diseases while growing Chinese cabbage, amaranth, sweet potato leaves, and other vegetables mentioned in the above question?		
Yes	134	98.53
No	2	1.47
If that person mentions that they are using pesticides, do they seek advice before using the chemicals (also check the source of the advice)		
No	126	91.97
Yes	11	8.03
Where do you buy pesticides for the leafy vegetables you produce?		
From an authorized seller	86	62.77
Unlicensed vendor	1	0.73
Nearest market	67	48.91
Have you ever received training on the use of pesticides in vegetable farming?		
Yes	49	35.77
No	88	64.23



## TABLE 2: KNOWLEDGE OF RESPONDENTS RELATED TO PESTICIDES USE

VARIABLE		FREQUENCY	PERCENTAGE
Do you know that pesticides do expire	Yes	84	61.76
	No	4	2.95
	I do not know	48	35.29
Do you know that the pesticides used may exist on the vegetables harvested for sale or consumption?"			
	Yes	27	19.87
	No	39	28.68
	I do not know	70	51.47
As a response to the above question, are you aware of any health issues caused by exposure to residues of pesticides in leafy vegetables?			
	Yes	38	27.74
	No	33	24.08
	I do not know	66	48.18
Have you ever experienced any health issues after applying pesticides to the vegetables during farming?			
	Yes	103	75.18
	No	21	15.33
	I do not know	13	9.49
If the answer above is YES, specify the consequences you experienced.			
	coughing	19	13.87
	Skin itching	74	54.1
	sneezing	19	13.87
	Eye itching	20	14.6
	Breathing difficulties	10	7.3
	others	18	13.14

**TABLE 3: PRACTICE OF THE RESPONDENTS RELATED TO PESTICIDE USE**

VARIABLE	FREQUENCY	PERCENTAGE
What type of pesticide do you use to spray spinach/amaranth/greens and other vegetables? Please specify.		
abanil	15	10.95
farmguard	41	29.93
Duducron	133	97.08
fiprofarm	19	13.87
abamix	6	4.38
Do you look at the labels and can understand and follow instructions on the labels?		
No	66	48.18
Yes	42	30.66
I don't know	29	21.16
Do you wear protective clothing and equipment when applying pesticides?		
Yes	35	25.55
No	102	74.45
How many rounds of pesticides do you apply per each vegetable mentioned in question 8 above per season?		
After a week	10	7.3
Two weeks	86	62.77
month	26	18.98
More than a month	15	10.95

# TABLE3: PRACTICE OF THE RESPONDENTS RELATED TO PESTICIDE USE

	FREQUENCY	PERCENTAGE
<b>How long do you wait before harvest for sale or consumption after the application of pesticides to vegetables?</b>		
Day of application of pesticides to vegetables.	0	0
Day after application of pesticide	39	28.46
Before seven days after application of pesticides to vegetables	51	37.23
seven days after application of pesticides to vegetables	47	34.31
<b>Do the pesticides use effective?</b>		
Yes	17	12.41
No	8	5.84
Not always	112	81.75
<b>When the pesticides applied are ineffective what are the alternative methods used to solve the problem?</b>		
Reapplying pesticides used in vegetables.	34	28.82
Mixing more than one pesticide in one tank.	21	15.33
Increasing the dosage of pesticides.	51	37.23
Seeking advices from agricultural officer	16	11.68
Not doing anything.	15	10.94
<b>Where do you store pesticides and pesticide application equipment for vegetables?</b>		
kitchen	2	1.46
room	5	3.65
In the living room	2	1.46
At the farm	46	33.58
To buy and use it all at once.	12	8.76
Storage of agricultural inputs	88	64.23



**TABLE3: PRACTICE OF THE RESPONDENTS RELATED TO PESTICIDE USE**

	FREQUENCY	PERCENTAGE
<b>How do you treat empty pesticides bottles/containers that have been used?</b>		
To wash and reuse them for other purposes such as storing food/water.	3	2.19
Burying them in the soil.	5	3.65
Selling them to people for the other purposes.	5	3.65
Abandoning them at the farm	34	24.82
Throwing them in the trash	103	75.18
<b>When you realize that pesticides have expired, what do you do?</b>		
Burying them in the soil	3	2.19
To continue using the particular pesticide.	9	6.57
Seeking advices from agricultural officers	24	17.52
Throwing them in the trash	101	73.72

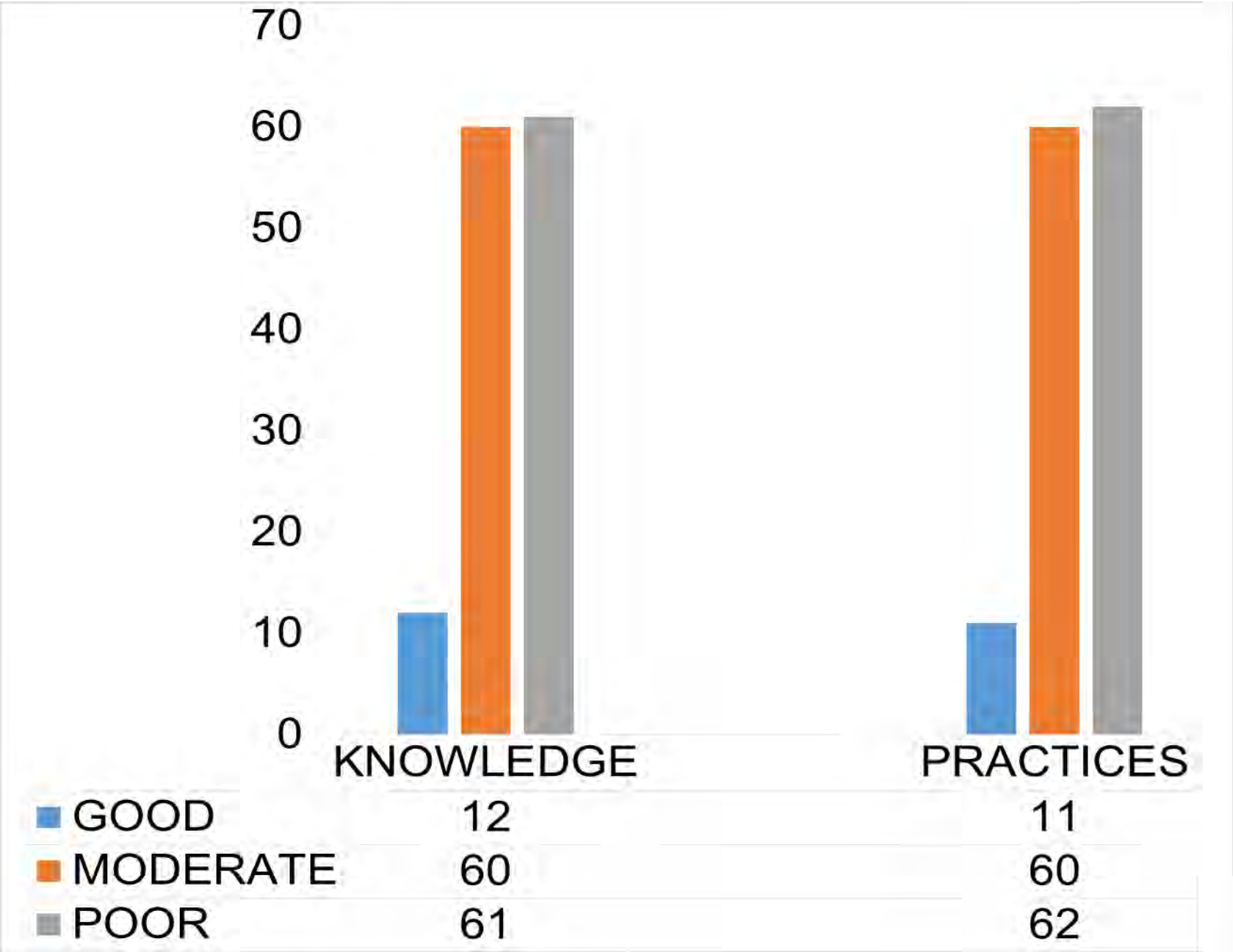


TABLE 4: KNOWLEDGE AND PRACTICES AGAINST SOCIAL DEMOGRAPHIC FACTORS

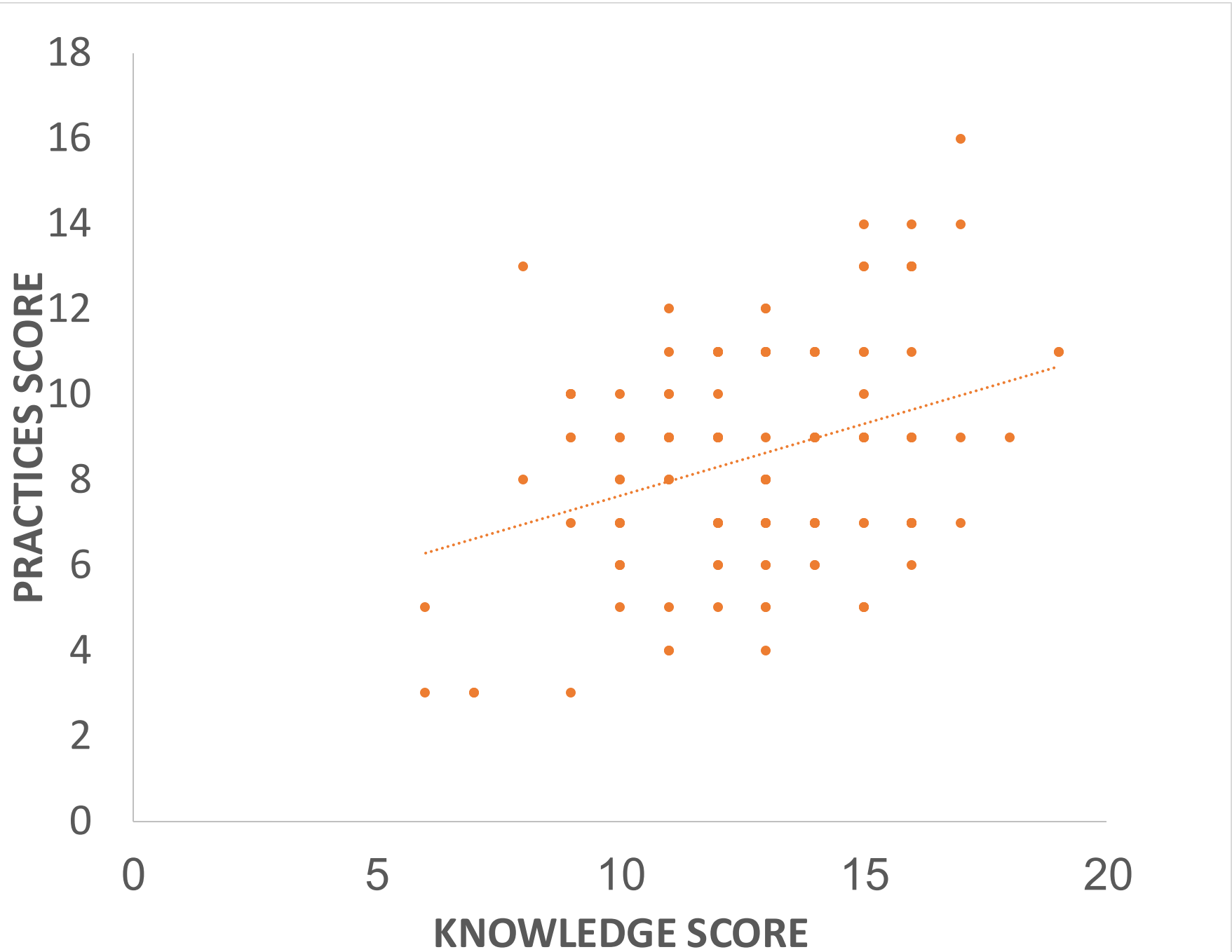
VARIABLE		FREQUENCY	PERCENTAGE	KNOWLEDGE	PRACTICES
WARD					
	Kinyerezi	72	45.90	0.14	0.49
	Gongo la mboto	61	54.10		
AGE OF THE RESPONDENTS					
	below 35	34	25.60	0.87	0.56
	36-40	26	19.50		
	41-45	26	19.50		
	46-50	14	10.50		
	50-above	32	24.90		
SEX OF THE RESPONDENTS					
	Male	54	41.20	0.27	0.42
	Female	81	58.80		
EDUCATION LEVEL					
	Primary education	54	39.42	0.35	0.00
	Secondary education	40	29.20		
	Post-secondary education	23	16.79		
	Never attended	20	14.59		
EXPERIENCE IN FARMING (in years)					
	0-5	64	48.10	0.72	0.19
	6-10	12	09.00		
	11-15	5	03.80		
	15- above	52	39.10		



# KNOWLEDGE AND PRACTICES LEVELS AND CORRELATION BETWEEN KNOWLEDGE AND PRACTICES OF THE STUDY POPULATION



**FIGURE 1:** knowledge and practices levels of the study population



**FIGURE 2:** correlation between knowledge and practices scores



# DISCUSSION

- Farmers heavily exposed to pesticides, with poor knowledge and practices (Mubushar *et al.*, 2019).
- Low education hinders understanding of pesticide labels and safety instructions (Kapeleka & Mwaseba, 2017).
- Organophosphate pesticides, like Duducron, commonly used; improper application methods observed (Massomo, 2019).
- Poor disposal practices of pesticide containers lead to environmental pollution (Ibrahim *et al.*, 2020).
- Lack of training exacerbates unsafe pesticide use and health risks (Jean *et al.*, 2019).
- Education and training significantly improve pesticide safety and awareness (Lekei *et al.*, 2014).



# CONCLUSION AND RECCOMENDATIONS



- **Urgent Need for Pesticide Education**

Tailored programs are crucial for improving safe pesticide use.

- **Collaborative Training Initiatives:** Policymakers and stakeholders should implement accessible training and awareness campaigns.
- **Promote Protective Gear:** Use incentives and social media to encourage safe pesticide application practices.
- **Strengthen Monitoring:** Regulatory authorities should enforce compliance with pesticide safety regulations.

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# Thank You



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