

Socio Economic Survey Questionnaire Instrument

Farmers' Attitudes Towards Treated Sludge (Biosolids) use in Agriculture: Evidence from Jordanian Badia

Tracing soil amendment impacts of processed wastewater sludge on the rehabilitation of Jordan's agro- pastoral areas (TRACE Rehab)

Masnat Al Hiary ⁽¹⁾, Boubaker Dhehibi ⁽²⁾; Mira Haddad ⁽³⁾, and Stefan Strohmeier ⁽³⁾

- (1) Socio- economic Studies Directorate - National Agricultural Research Center (NARC) – Jordan.
- (2) Resilient Agricultural Livelihood Systems Program (RALSP) - International Center for Agricultural Research in the Dry Areas (ICARDA) – Amman, Jordan.
- (3) Water, Land, and Ecosystems Program (WLEP) - International Center for Agricultural Research in the Dry Areas (ICARDA) – Amman, Jordan.

May 2020

Context of the Survey

The purpose of this survey is to investigate farmers' perceptions of land application of treated sewage sludge on their farms/agro-pastoral communities.

The data collected will be useful to assess farmers' perceptions and attitudes of sludge-based co-compost (*biosolids*) and to define potential factors influencing their willingness to use /or not this type of fertilizer. Thus, understanding farmers' perceptions and opinions about the use of sludge-based compost (*biosolids*) will ensure the capitalization of the existing opportunities to address the dual challenge of waste management and soil nutrient depletion in Jordan via the safe recovery of nutrients from both solid and liquid waste streams for reuse in agriculture.

The NARC socio-economic team in Jordan will collect the data and submit the raw data as well as the analytical report as part of the TRACE Rehab developed a work plan for the cycle 2019-2020

General Information

- Name of Interviewer/Enumerator: _____ Date: / /2020
- Name of Field Supervisor: _____ Date: / /2020
- Name of Data Entry Clerk: _____ Date: / /2020
- Name of Supervisor (Data Entry): _____ Date: / /2020

Interview Background

- Date of the interview (DD/MM/YY)

- Name of Governorate:

- Name of District:

- Name of Village:

- Name of Respondent (Head of Household):

- Geographic coordinates of the household house:
Longitude: ' " (or in decimal degree with precision up to 4 decimal digits) Latitude
..... ' " (or in decimal degree with precision up to 4 decimal digit)

First Part: Socio Demographic Characteristics of the Household

1. Sex _____ (1= Male, 0= Female)
2. Female Headed Household _____ (No=0, Yes =1)
3. Age _____
4. Marital status _____ (1=married, 2=single, 3=divorced, 4=widowed)
5. Educational level _____ (1= none, 2= Read and write, 3= Elementary, 4= high school graduate, 5= vocational training, 6 = intermediate diploma, and 7 = B.S. and above)
6. Occupation _____ (1= Farmer, 2 = Gov't employee, 3 = Private business, 4 = Student, 5 = other: (Specify))

7. Family size _____ (#)
 8. Off farm work _____ (No=0, Yes =1)
 9. Status of landownership _____ (Otherwise=0, Owns land =1)
 10. Experience in agriculture _____ (#years)
 11. Area size (Du) _____; Land slope) _____
 12. How long have you lived in this community _____ years or months
 13. Are you member of any farmer's association (cooperative, CBO, etc.) _____ (No=0, Yes =1). If yes _____ (years), percent (%) _____

Second Part: Agriculture Farming System

14. What is your main source of income? **1=**Agriculture (specify crops), **2=** Livestock (specify types of animals), **3=** Employment (specify the type of job), and **4=** Other-----

15. Net Household income (JD/category)

1= < 1000, 2= 1001 - 3000, 3= 3001 - 5000, and 4= > 5000

16. Do you have a secondary occupation? i.e. in addition to your main source of income? (0= No, 1= Yes) _____ If yes, please specify _____

17. Employment Status _____ **1=** Full-time employment, **2=** Part-time employment, **3=** Unemployed, **4=** Retired, **5=** House work, and **6=** Farm work

18. Do you own any farm land? (0=No, 1= Yes) _____ If yes, where? _____ and what is the size of your farm land? _____

19. Do you rent any farm land? (0=No, 1= Yes) _____ If yes, where? _____ and what is the size of your farm land? _____

20. What is the size of your cultivated land? _____ dunum

21. What are the size of your agricultural land and the type of crops or plants do you grow on your land?

Crops	Size (Dunum = 1000 m ²)	Uses	Services/production	Times of using fertilizers- specify the month	Amount of fertilizers	For which crop could you have used treated sludge (Yes/No)
Olives		Olives: Olive oil:	Kg/ha or total kg			
Barley		Grazing (Fodder) Cultivation:	For how long/number of herds Kg/ha or total kg			
Other						

(Specify)						

Third Part: Farmer's Perceptions and Attitudes Towards Use of Fertilizers/Sludge

1. Farmers' Fertilizer use Patterns and Purchasing Behaviour

22. What is the dominant fertilizers used in your cultivated land _____
(1=Inorganic, 0=Organic/other)
23. Do you use organic fertilizers _____ (1=Yes, 0=No)
24. From where do you get the organic fertilizers? (1=Own farm, 2=Bought, 3=Both 1 & 2)
25. Do you use chemical fertilizers _____ (1=Yes, 0=No)
26. Do you use treated animal manure _____ (1=Yes, 0=No)
27. What is the type of manual manure used _____ (1=Treated, 2=Fresh, 3=Both 1 and 2)
28. Are you satisfied with the existing sources of fertilizers _____ (1=Yes, 0=No)
29. How much did you pay per ton? _____ (1=Animal NIS, 2=Birds NIS)
30. Did you heard about treated bio solids _____ (1=Yes, 0=No)
31. Did you used treated bio solids before _____ (1=Yes, 0=No)
32. What is your perception of treated sludge use in agriculture _____
(1=Positive, 0=Negative)
33. What is your perception of treated sludge use to improve soil fertility of rangelands _____
(1=Positive, 0=Negative)
34. Do you think that treated sludge is good alternative to existing resources?
_____ (5. Very much, 4. Much, 3. Do not know, 2. No, 1. Definitely not)
35. Do you think that treated sludge better than available resources? _____ (5. Very much, 4. Much, 3. Do not know, 2. No, 1. Definitely not)

If you did not used treated sludge before:

36. Are you willing to use it? _____ (1=Yes, 0=No)
37. If No, this is because: _____ (1. Do not trust that sludge is suitable, 2. Concern about consumer's attitude, 3. Special needs are associated with sludge use 4. Others, Specify)
38. Would you be willing to use treated sludge as a soil improver for your agricultural land?
_____ (5. Very much, 4. Much, 3. Do not know, 2. No, 1. Definitely not)
39. Do you think treated bio solids can be used for all crops? (1=Yes, 0=No)
40. How much are you willing to pay for treated sludge? _____ (1=the same price as animal manure, 2= $\frac{3}{4}$ the price of animal manure, 3= $\frac{1}{2}$ the price of animal manure, 4= $\frac{1}{4}$ the price of animal manure, 5= Nothing)
41. How do you think using treated sludge will affect the environmental situation in your community? _____ (1=Yes, 0=No)

2. Factors Influencing Farmer's Fertilizer Purchasing Decisions

(5-level Likert scale ranking: 1, being without influence and 5, being very influential)

Factors influencing farmers' purchasing decisions	Likert Scale Ranking (1, being without influence, and 5 being very influential)
Price of the fertilizer	
Nutrient content	
Organic matter	
Water-holding capacity	
Safety	
Packaging	
Certification label	
Brand name	
Volumes to apply,	
Fertilizer application,	
Recommended by a trusted source,	
Know someone who has used it,	
Product is locally made,	
Product is imported	

3. Use of Compost

1- Type of fertilizer used	1-Organic	2-Chemical		
2- Do you ask reference authority about suitable fertilizer?	1-Yes	2-No		
3- Do you think that the extension gives adequate information about the fertilization	1-Yes	2-No		
4- The types of fertilizer you prefer	1-Organic	2-Chemical		
5- The types of fertilizer you can dispense	1-Organic	2-Chemical		
6- Type organic manure used	1- fermented	2-Not fermented		
7- If the manure used is not fermented, do you know environmental restrictions and regulations for the use	1-yes	2-No		
8- Have you an idea about the role of fermented organic manure environmental is pollution restriction?	1-yes	2-No		
9- Source of fermented or non-fermented organic fertilizer?	1-From your farm	2-Buys		
10-If you produce organic fertilizer fermented what type you make	1-Plant residues	2-manure	3- Remains of fish	4-(1+2)
11- what is the best type of organic fertilizer fermented you advises farmers to use	1- manure	2-Plant residue	3-(1+2)	4-Organic fertilizer liquid
12- If you have any idea about the manure advantage, will you use it?	1-yes	2-No		
13- Do you think that fermented organic manure reduces desertification?	1-yes	2-No		

14- If your land is a sandy soil texture do you think that manure improves the water holding capacity and increase soil fertility	1-yes	2-No
15- Do you accept the use of other manufactures manure which manufactories from mixed human waste?	1-yes	2-No

4. Sources and Preferences on the use of Fertilizers

. Which agencies do you ask about suitable fertilizer?

-
-

45. Do you prefer the use of chemical fertilizer, why	46. What are the problems facing farmers when using chemical fertilizer?	47. What about your opinion?

48. If you prefer (fermented or non-fermented) organic fertilizer mention the reason?	49. What problems face to farmers when his use of organic fertilizer (fermented or non-fermented)?	50. What about your opinion?