# APPENDICES

**Appendix I: Variable Inflation Factor with a mean**

|  |  |  |
| --- | --- | --- |
| Variable | VIF |  1/VIF |
| Lnlaborman-dayha | 3.07 | 0.325692 |
| Lnland size ha | 2.72 | 0.367400 |
| lnox\_ ha | 1.91 | 0.523210 |
| lnseedkg\_ ha | 1.44 | 0.694505 |
| lnnps\_kg\_ ha | 1.03 | 0.966936 |
| lnche\_lt\_ha | 1.02 | 0.983010 |
| Mean VIF | 1.87 |  |

Source: own computation, (2023)

**Appendix II: QUESTIONNAIRE**

**TECHNICAL EFFICIENCY IN FABA BEAN (*Vicia faba L*.) PRODUCTION IN ETHIOPIA, THE CASE OF WEREILLU DISTRICT**

Hello! My name is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and I work in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This is MSc student thesis of Wollo University on the title “**TECHNICAL EFFICIENCY IN FABA BEAN (Vicia faba L.)** **PRODUCTION IN ETHIOPIA, THE CASE OF WEREILLU DISTRICT”.** We have randomly selected households in order to find some important issues on technical efficiency mainly focused on Faba-bean and you are one of them or a parent. The information you gave us will be used only for the purpose of research and will not be used by anyone else. I hope you will co-operate us kindly and answer the questions correctly. Thank you very much!

**Part I. Personal Information of the Household Head and the Family**

1. **General characteristics about the farm household**

 1.2. Name of the household’s head \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 1.3. Sex 1. Male 2. Female

* 1. Age \_\_\_\_\_\_
	2. Education level: 1. Illiterate 2. Read & Write 3. Formal education (\_\_\_\_\_\_Grade)
	3. Marital Status: 1. Single 2. Married 3. Divorced 4. Widow 5. Separated
	4. Number of Family Members (including the head): Male\_\_\_\_\_\_\_ Female \_\_\_\_\_\_\_Total \_\_\_\_­­\_\_
	5. Number of family member’s and age structure (including the head)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Name  | Sex | Age | Kinship\* | Education  | Occupation \*\* |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |
| 11 |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  |

\* 1. Head 2. Wife 3. Children 4. Labourer 5. Others specify

\*\* 1. Full time farming 2. Part time farming 3. Student

**2. General plot description**

2.1. Land ownership 1. Owned 2. Rented 3. Shared 4. None

2.2. Plot distance from the residence in km (in walking minutes) \_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.3. Soil color 1. Red 2. Black 3. Brown

2.4. Slope of the plot 1. Sloppy 2. Gentle 3. Plain

2.5. Fertility status 1. Fertile 2. Not fertile

2.6.Land use pattern

Total Area of land ………… (ha) Homestead land…………... (ha)

Cultivated land……………... (ha) Fallow land………………. (ha)

Grazing land………………... (ha) Other land………………… (ha)

**3. Farming practices**

3.1. Land preparation 1. Good 2. Medium 3. Bad

3.2. Vegetative growth 1. Good 2. Medium 3. Bad

3.3. Weed infestation 1.High 2. Medium 3. Low

3.4. Dominant weeds 1. Grass weeds 2. Broad leaves 3. Mixed

3.5. Are there soil conservation structures built on the land? 1. Yes 2. No

3.6. Type of soil conservation structures

 1. Soil bund 2. Stone bund 3. Cut of drain

 4. Check dam 5. Agro-forestry Practices 6. Others

**4. Responsibility**

4.1. Do you have any responsibility in the society? 1. Yes 2. No

4.2. What is your responsibility in the society?

 1. Management body of the PA 2. Cadres 3. Militia 4. Management body of other social organizations 5. Other specify---------------------------------

4.3. Does your responsibility have significant negative impact in farming activities?

 1. Yes 2.No

4.4. How many days on average do you spend per week to in your responsibility? -----------days

4.5. Who take care of the farming activities while executing your responsibility?

 1. Family members 3. Relatives 5. Other, specify---------------------------

 2. Hired workers 4. The society

**5. Means of livelihood, annual income and expenditure of the sample farmers**

* 1. What is the main or the first source of income (means of livelihood) of the household?

1. Crop production 2. Livestock Production 3. Crop & livestock Production

 4. Forest products 5. Petty trade 6. Other (specify) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.2. What is the secondary source of income (means of livelihood)? 1. Crop production 2. Livestock products 3. Forest products 4. Petty trade 5. Off-farming employment 6. Others if any\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Estimates of annual income of the HH from different sources

|  |  |  |  |
| --- | --- | --- | --- |
| No | Type of Expenditure  | Annual Expenditure in Birr | Remark |
| 1 | Food  |  |  |
| 2 | Clothing  |  |  |
| 4 | Salt, sugar, oil etc  |  |  |
| 5 | Soap and other sanitation purposes  |  |  |
| 6 | Health care expense  |  |  |
| 7 | Education  |  |  |
| 8 | Farm inputs  |  |  |

5.4. How much is your average expenditure per month? --------------Birr, per year? \_\_\_\_\_\_\_\_\_\_ Birr

 A) For food items, \_\_\_\_\_\_\_\_\_\_\_\_\_ Birr B) For non-food items, \_\_\_\_\_\_\_\_\_\_\_ Birr

5.5. How many school children do you have? ---------------------------------

5.6. How much did you spend for your school children per year? -----------------------

5.7. How much did you spend for medication if there was an illness per year? ----------

5.8. How many holidays per month during main or meher season you consistently celebrate? \_\_\_\_\_\_\_

**6. Livestock ownership in number and TLU**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Type of animal** | **No owned** | **TLU** |
| 1  | Oxen |  |  |
| 2 | Cow |  |  |
| 3 | Heifer |  |  |
| 4 | Calves |  |  |
| 5  | Donkey |  |  |
| 6 | Sheep young |  |  |
| Sheep adult |  |  |
| 7 | Goat young |  |  |
| Goat adult |  |  |
| 8 | Hen |  |  |
| 9 | Beehives |  |  |
| 10 | Other……………………... |  |  |

 **7. Land Ownership**

7.1. Land Ownership

|  |  |
| --- | --- |
| Total Size in **Hectare** | Tenure system (in ha) |
| Owned  | Rented/shared in  | Rented/shared out  | Communal |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**8: HOUSEHOLD ASSET ENDOWMENTS OTHER THAN AGRICULTURE**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Asset 2021/22 | Number of Asset | Value in birr | Ownership1=husband 2=wife3=joint ownership | Who has access to these assets?1=husband2=wife3=children4=all family members5=other specify. | When was assetacquired? |
| **Non-agri. asset** |  |  |  |  |  |
| Iron roof houses |  |  |  |  |  |
| Thatched roof houses |  |  |  |  |  |
| Bicycles |  |  |  |  |  |
| Motorcycles |  |  |  |  |  |
| Personal car |  |  |  |  |  |
| Commercial car |  |  |  |  |  |
| Bajaj  |  |  |  |  |  |
| Bed |  |  |  |  |  |
| Chair/sofa |  |  |  |  |  |
| Mobiles  |  |  |  |  |  |
| Mats  |  |  |  |  |  |
| Solar light |  |  |  |  |  |
| Radio/tape |  |  |  |  |  |
| Television |  |  |  |  |  |

**9. AVERAGE ANNUAL HOUSEHOLD INCOME SOURCES**

|  |  |  |
| --- | --- | --- |
| **Type of earning income** | Current Income 2021/22 | Was income more same or less compared to 2019/20? 0=less 1=same 2=more |
| Amount  | Frequency  |  |
| **Employment income** |  |  |  |
| Income from faba-bean produce |  |  |  |
| Income from farm products other than faba-bean |  |  |  |
| Income from sale of livestock and movable asset  |  |  |  |
| Transfer earnings from relatives, children etc. |  |  |  |
| Borrowing from friends, neighbors |  |  |  |
| Loans from credit inst. /associations |  |  |  |
| Value of gifts |  |  |  |
| Land rented out income |  |  |  |
| Other income |  |  |  |
| Total annual income |  |  |  |

**10. COLLECTIVE ACTION**10.1. Are you **currently (2021)** a member of any farmers’ group or local association in this village? If yes, give the name.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Name of group or association(include local institution) | Please rank the Primary objectives of association: rank them 1=savings 2=agriculture3= marketing4=welfare5=other | Your position in the group1=committee member2=ordinarymember | How longhave youbeen amemberof thisgroup? | Does your wife or husbandbelong to the same group with you1=Yes, 0=No | Was yourparticipation differentbefore 5years?0=No 1=yes | If differentpleaseindicate thedifferences |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

10.2). How often have you or members of your household joined with other farmers in this
village to work collectively? ..............................................................................................................

**11. Services**

**A. Extension Service**

11.1. Do you have extension contact? (1). Yes (2). No

11.2. How often do you visit the extension workers?

 1. Weekly 2. Fortnightly 3. Monthly 4. Quarterly

 5. Other, specify------------------------------------------------------------------------------

11.3. How often does the extension worker visit you?

 1. Weekly 2. Fortnightly 3. Monthly 4. Quarterly

 5. Other, specify-----------------------------------------------------------------------------

**B. Credit service (Access to markets)**

11.4. Do you have access to any sources of credit? 1. Yes 2. No

11.5. Have you received any borrowing from the institutions last year (2020/21)? 1. Yes 2. No

11.6. If yes; for what purpose did you borrow from the formal sources?

**C. Saving**

11.7. Do you have a saving habit? 1. Yes 2. No

11.8. How much do you save per year? ---------------Birr

11.9. Where do you save? 1. Home 2. Commercial banks

 3. Amhara credit and saving institution 4. Other, specify-----------------------------------

**D. ACCESS TO MARKET**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Distance in Kg** | \*Means of travel | **Time in minutes**  |
| Currently2021/22 | Currently2021/22 | Currently2021/22 |
| Input mkt. | Nearest market |  |  |  |
|  | Most important (district) mkt. |  |  |  |
| Output mkt. | Nearest market |  |  |  |
|  | Most important (district) mkt. |  |  |  |
|  | Distance/time to Main Road |  |  |  |

\*1=private car 2=public transport 3=motorbike 4=bicycle 5=walking 6=other, specify

**11).** **Gender and labor distribution of households on faba-bean production.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Plowing  | Planting  | Weeding  | Fertilizing  | Spraying  | Harvesting  | Post- harvest handling | Marketing the produce |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

Codes 1=Husband only; 2=Wife only; 3=Husband mostly; 4=Wife mostly; 5=Husband and
wife equally; 6=Children; 7=Hired labour; 8=exchange labour 9=Other (specify)……………

**12. Production activities**

12.1. What are major crops you grow in Meher season?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12.2. How many plots do you have? --------------

12.3. On how many plots do you plant faba bean 2021 (last year) using irrigation? ------------------

12.4. How much of your land is covered by faba bean crop last year? --------------timad

12.5. What are the major varieties of faba bean you are growing? Specify-----------------------

12.6. What is the earliest date of land preparation for faba bean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12.7. What is the latest date of land preparation for faba bean crop? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12.8. At what time did you start land preparation this year? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12.9. How many times did you plough your faba bean land? ------------------

12.10. What is the earliest date of sowing/ planting? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12.11. What is the latest date of sowing/planting faba bean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12.12. At what time did you sow /plant faba bean this year? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

12.13. How many times do you apply water (irrigate) your faba bean field per week/ season? -----------

12.14. Did you use chemical fertilizer in faba bean field? 1. Yes 2. No

12.15. If yes, what type of fertilizer?

 1. DAP 2. Urea 3. Both 4. NPS 5. Compost/ manure 6. Other, specify---------------

12.16. How many Kg of DAP per hectare did you use for faba bean? ------------------------

12.17. How many Kg of Urea per hectare did you use for faba bean? ------------------------

12.18. How many kg of TSP per hectare did you use for faba bean? ………………………

12.19. If you do not use fertilizer, why?

 1. Too expensive 2. Inconvenient to transport 3. Not timely available 4. Not available

 5. Not good to apply on faba bean field 6. Other------------------------------------

12.20. Did you use organic fertilizer on faba bean field? 1. Yes 2. No

12.21. If yes, what kind of organic fertilizer do you use?

 1. Green manure 2. Animal waste 3. Compost 4. Others, specify-----------------

12.22. How many quintal/ha of organic fertilizer do you apply for your faba bean crop? --------

12.23. If you are not using organic fertilizer, why? 1. It’s bulky to transport 2. Lack of awareness 3. I do not have animals to prepare it 4. Others, specify-----------------------

12.24. Years of experience in producing faba bean -------------------------------

**Part-II. Information on faba bean yield**

13.1. Is weeding faba bean crop a common practice? 1. Yes 2. No

13.2. If yes, when you start weeding faba bean? -----------Week of --------------month

13.3. How many times do you weed? ---------------------times.

13.4. What method did you use for weeding?

 1. Hand weeding 2. Hoeing 3. Chemicals 4. Others, specify------------------

13.5. Did you use improved faba bean varieties this year? 1. Yes 2. No

13.6. If yes, list name of variety and source of seed.

13.7. If no, why? 1. Too expensive 2. Not better than local varieties

 3. It is not easily accessible 4. Other specify -------------

13.8. Do you use crop protection chemicals? 1. Yes 2. No

13.9. If yes, what types of chemicals do you mostly use? List name of chemicals, amount, price and sources \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13.10. If no, why? 1. Too expensive 2. Lack the knowledge of application 3. Not timely available 4. Not available at all 5. Not effective 6. Risky for animals 7. Other --------

13.11. When did you harvest your faba bean crop? ------------- week of ------------month

13.12. How much man-days you employed to harvest faba bean? -------------

13.13. From where did you get the additional labour requirement? If any.

 1. Family labour was enough 2. Debo

 3. Employing daily labourers 4. Any other means--------------------

13.14. How many quintals of faba bean yield did you received this year? ----------------Qt

13.15. How much did you sell it per Kg------------------Birr per quintal-----------------Birr

13.16. Is there any natural hazard in the production year in the production of faba bean?

 1. Yes 2. No

13.17. What were these natural hazards? 1. Frost 2. Animal damage 3. Flood

 4.Drought 5. Others specify \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

13.18. How much output you would have got, had there were no hazard \_\_\_\_\_\_\_\_\_\_\_ quintal

13.19. Production cost of faba bean (from land preparation to harvesting) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Birr

13.20. What are the major constraints of faba bean production? list and rank them

a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.21. Inputs used in major farming activities

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Operations** | Labor hrs.Man-days\*  | Oxen hrs. Oxen days\*  | Seed/seedlings (kg/no) | Fertilizer (kg) | Insecticides (lit) | Herbicides (lit) | Manure (kg) | Farm tools |
| NPS | Bio-fertilizer | Type\*\* | No. | duration |
| Plowing | First |  |  |  |  |  |  |  |  |  |  |  |
| Second |  |  |  |  |  |  |  |  |  |  |  |
| Third |  |  |  |  |  |  |  |  |  |  |  |
| Planting  |  |  |  |  |  |  |  |  |  |  |  |
| Weeding  | Total  |  |  |  |  |  |  |  |  |  |  |  |
| Thinning  |  |  |  |  |  |  |  |  |  |  |  |
| Harvesting/picking  | First |  |  |  |  |  |  |  |  |  |  |  |
| Second |  |  |  |  |  |  |  |  |  |  |  |
| Trashing |  |  |  |  |  |  |  |  |  |  |  |
| Transporting |  |  |  |  |  |  |  |  |  |  |  |

Would you like to make any comments or ask questions? 1=Yes 0=No, if yes,

What are the comments or questions? ......................................................................................................................................................................................................................................................................................................................................................................................

Thank you very much!!!!

**Interviewed by…………………... Checked by………………………**

**Date………………………. Date………………………………...**

**Observations………………………… Comments………………………....................**