IJEMS-23-104300

Analysis the Economic Efficiency of Common Beans Production among Smallholder Farmers: In Case of Burji District, Southern Nation National Peoples Region, Ethiopia

Chanyalew Malle Shoko*
Department of Agricultural Economics, University of Gondar, Gondar, Ethiopia
***Address for Correspondence:** Chanyalew Malle Shoko, Department of Agricultural Economics, University of Gondar, Gondar, Ethiopia, Tel: 910369238; E-mail: chanyalewmalle@gmail.com*

Received: 29 June, 2023, Manuscript No. IJEMS-23-104300**; Editor assigned:** 03 July, 2023, PreQC No. IJEMS-23-104300 (PQ); **Reviewed:** 18 July, 2023, QC No. IJEMS-23-104300; **Revised:** 16 April, 2024, Manuscript No. IJEMS-23-104300 (R); **Published:** 23 April, 2024, DOI: 10.37421/2162-6359.2024.13.719

Supplementary file

Appendix 1

Variables	VIF	1-R2 (Tolerance)
Lnlab	4.36	0.229419
Lnoxen	6.29	0.15903
LnDAP	3.93	0.25439
Lnseed	2.4	0.41736
Lnland	4.27	0.2343
Lnchem	1.28	0.78163
Mean VIF	3.75	
Source: Own computation (2021)		

Table 1. VIF of the farm specific variables of the stochastic frontier production function model.

Variables	VIF	1-R2 (Tolerance)
Lnoutput	5.94	0.1683
Lnlandcost	6.25	0.1599
LnDAPcost	6.95	0.1438
Lnseedcost	7.1	0.1407
Lnchemcost	1.58	0.6299
Lnlabcost	6.34	0.1577
Lnoxencost	4.98	0.2008

Mean VIF	5.595	
Source: Own computation (2021).		

Table 2. VIF of the farm input variables of the stochastic frontier cost function model.

Variables	**VIF**	**1-R2 (Tolerance)**
Age	1.81	0.4487
Familysize	1.8	0.553
Educ	1.12	0.8891
Dsmrkt	1	0.9956
TLU	1.25	0.7958
Mean VIF	1.396	
Source: Own computation (2021).		

Table 3. The VIF for the categorical and continuous variables used to economic efficiency model (N=313).

Variables	**Sex**	**Training**	**Off-farm**	**Extcontact**	**Credit**	**Crop pest**
Sex	1					
Training	0.284	1				
Off-farm	0.515	0.253	1			
Extcontact	0.007	0.034	0.309	1		
Credit	0.28	0.061	0.466	0.187	1	
Crop pest	0.295	0.416	0.339	0.062	0.011	1
Source: own computation (2021).						

Table 4. Contingency coefficients for the socio-economic dummy explanatory variables.

Variables	**Cobb-Douglas coefficient**	**t-ratio**	**Translog coefficient**	**t-ratio**
Constant	4.34	15.54	11.83	10.74
lnseed	9.10E-06	-10.81	2.4	2.64
lnlabor	0.404	5.56	-2.46	-2.76
lnDAP	5.90E-06	8.63	-0.2	-0.203
lnchem	0.18	5.6	1.13	3.11
lnland	1.70E-05	10.84	-2.21	-4.3
lnox	0.29	7.12	0.38	0.32
Lnseed2			0.49	1.83
Lnlabor			-0.37	-1.8
LnDAP			-0.67	-2.42
Lnchem2			0.01	2.1
Lnlnad2			0.05	0.73
Lnox2			-0.07	-0.52
Lnseed*lnlabor			-0.97	-2.73
Lnseed*lnDAP			0.23	0.55
Lnseed*lnchem			-0.07	-0.76
Lnseed*lnland			-0.22	-0.85
Lnseed*lnox			-0.02	-0.07
Lnlabor*lnDAP			0.91	0.28
Lnlabor*lnchem			-0.09	-1.54

Lnlabor*lnland			0.47	2.39
Lnlabor*lnox			0.46	2.01
LnDAP*lnchem			0.09	0.89
LnDAP*lnland			0.26	1.03
LnDAP*lnox			-0.04	-0.19
Lnchem*lnland			-0.12	-2.58
Lnchem*lnox			0.03	0.43
Lnland*lnox			-0.25	-1.07
Sigma-square (σ2)	0.102	6.2	0.021	5.86
Gamma (γ)	0.999	19.833	0.17	1.21
Log-likelihood function	-34.71		-20.64	
LR	85.82		28.14	
Source: own survey data (2021).				

Table 5. The econometric parameters estimation results of the C-D and Translog.

Class	Technical efficiency		Allocative efficiency		economic efficiency	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
0.107-0.4	27	8.62	11	3.53	57	18.22
0.410-0.6	132	42.17	19	6.07	148	47.28
0.610-0.8	130	41.55	139	44.4	90	28.75
0.810-0.99	24	7.66	144	46	18	5.75
Mean	0.637	0.772			0.5	
Minimum	0.213	0.222			0.107	
Maximum	0.945	0.965			0.879	
Total sample	313	313			313	
Source: Own computation (2021)						

Table 6. Class, frequency and percentage distribution of TE, AE and EE estimates of common bean producer sample household.

Technical efficiency

FI	TE	FI	TE	FI	TE	FI	TE	FI	TE
1	0.599	71	0.6	141	0.599	211	0.789	281	0.712
2	0.251	72	0.558	142	0.532	212	0.71	282	0.712
3	0.405	73	0.6	143	0.799	213	0.554	283	0.804
4	0.435	74	0.843	144	0.564	214	0.599	284	0.807
5	0.484	75	0.6	145	0.396	215	0.581	285	0.763
6	0.503	76	0.6	146	0.6	216	0.551	286	0.609
7	0.341	77	0.454	147	0.6	217	0.526	287	0.608
8	0.405	78	0.46	148	0.88	218	0.523	288	0.601
9	0.481	79	0.6	149	0.589	219	0.586	289	0.609
10	0.345	80	0.481	150	0.356	220	0.554	290	0.904
11	0.491	81	0.537	151	0.599	221	0.554	291	0.768
12	0.459	82	0.413	152	0.92	222	0.904	292	0.767
13	0.421	83	0.402	153	0.619	223	0.765	293	0.712
14	0.697	84	0.619	154	0.283	224	0.906	294	0.766
15	0.61	85	0.628	155	0.609	225	0.765	295	0.766

16	0.506	86	0.606	156	0.426	226	0.9	296	0.765
17	0.49	87	0.404	157	0.623	227	0.409	297	0.712
18	0.51	88	0.6	158	0.332	228	0.919	298	0.712
19	0.489	89	0.599	159	0.623	229	0.9	299	0.712
20	0.421	90	0.564	160	0.301	230	0.828	300	0.712
21	0.408	91	0.883	161	0.584	231	0.904	301	0.765
22	0.405	92	0.8	162	0.586	232	0.9	302	0.763
23	0.432	93	0.799	163	0.549	233	0.765	303	0.764
24	0.839	94	0.571	164	0.521	234	0.83	304	0.79
25	0.521	95	0.604	165	0.598	235	0.94	305	0.8
26	0.587	96	0.8	166	0.595	236	0.923	306	0.567
27	0.605	97	0.616	167	0.623	237	0.213	307	0.597
28	0.623	98	0.628	168	0.554	238	0.324	308	0.576
29	0.701	99	0.679	169	0.621	239	0.929	309	0.598
30	0.628	100	0.681	170	0.662	240	0.932	310	0.604
31	0.615	101	0.8	171	0.712	241	0.765	311	0.608
32	0.623	102	0.6	172	0.8	242	0.934	312	0.354
33	0.562	103	0.6	173	0.71	243	0.945	313	0.809
34	0.756	104	0.598	174	0.213	244	0.768		
35	0.789	105	0.598	175	0.621	245	0.712		
36	0.572	106	0.659	176	0.585	246	0.712		
37	0.642	107	0.505	177	0.554	247	0.712		
38	0.701	108	0.4	178	0.607	248	0.712		
39	0.662	109	0.621	179	0.597	249	0.759		
40	0.739	110	0.555	180	0.623	250	0.8		
41	0.596	111	0.567	181	0.799	251	0.709		
42	0.537	112	0.55	182	0.789	252	0.709		
43	0.8	113	0.554	183	0.664	253	0.714		
44	0.61	114	0.8	184	0.621	254	0.896		
45	0.8	115	0.798	185	0.665	255	0.768		
46	0.6	116	0.604	186	0.599	256	0.767		
47	0.6	117	0.798	187	0.586	257	0.712		
48	0.503	118	0.403	188	0.709	258	0.766		
49	0.495	119	0.608	189	0.664	259	0.766		
50	0.6	120	0.609	190	0.623	260	0.765		
51	0.603	121	0.789	191	0.799	261	0.712		
52	0.6	122	0.373	192	0.554	262	0.799		
53	0.6	123	0.609	193	0.554	263	0.712		
54	0.596	124	0.592	194	0.541	264	0.712		
55	0.656	125	0.543	195	0.543	265	0.765		
56	0.435	126	0.409	196	0.609	266	0.763		
57	0.446	127	0.409	197	0.789	267	0.764		
58	0.556	128	0.528	198	0.666	268	0.899		
59	0.402	129	0.609	199	0.798	269	0.902		
60	0.423	130	0.609	200	0.79	270	0.905		

61	0.8	131	0.609	201	0.586	271	0.8		
62	0.59	132	0.598	202	0.586	272	0.809		
63	0.8	133	0.564	203	0.586	273	0.609		
64	0.353	134	0.567	204	0.553	274	0.809		
65	0.8	135	0.409	205	0.609	275	0.807		
66	0.4	136	0.599	206	0.798	276	0.919		
67	0.527	137	0.798	207	0.605	277	0.932		
68	0.604	138	0.597	208	0.797	278	0.609		
69	0.6	139	0.408	209	0.581	279	0.765		
70	0.597	140	0.407	210	0.798	280	0.808		
FI= Farmer identity; TE=Technical Efficiency; **Source:** Own computation, (2021)									

Table 7. Small household farmer's technical efficiency.

Allocative efficiency

FI	AE	FI	AE	FI	AE	FI	AE	FI
1	0.57	71	0.683	141	0.684	211	0.776	281
2	0.745	72	0.79	142	0.851	212	0.923	282
3	0.896	73	0.686	143	0.772	213	0.823	283
4	0.887	74	0.724	144	0.73	214	0.684	284
5	0.75	75	0.685	145	0.543	215	0.862	285
6	0.683	76	0.667	146	0.683	216	0.802	286
7	0.944	77	0.911	147	0.685	217	0.929	287
8	0.879	78	0.891	148	0.49	218	0.871	288
9	0.875	79	0.668	149	0.699	219	0.829	289
10	0.901	80	0.856	150	0.581	220	0.823	290
11	0.853	81	0.767	151	0.684	221	0.785	291
12	0.677	82	0.513	152	0.348	222	0.965	292
13	0.947	83	0.522	153	0.373	223	0.826	293
14	0.842	84	0.907	154	0.961	224	0.941	294
15	0.83	85	0.85	155	0.726	225	0.854	295
16	0.806	86	0.938	156	0.913	226	0.936	296
17	0.832	87	0.547	157	0.909	227	0.515	297
18	0.801	88	0.701	158	0.801	228	0.917	298
19	0.809	89	0.684	159	0.91	229	0.912	299
20	0.921	90	0.739	160	0.897	230	0.948	300
21	0.86	91	0.878	161	0.928	231	0.918	301
22	0.753	92	0.762	162	0.773	232	0.944	302
23	0.949	93	0.764	163	0.77	233	0.882	303
24	0.898	94	0.709	164	0.829	234	0.773	304
25	0.798	95	0.682	165	0.763	235	0.862	305
26	0.713	96	0.485	166	0.761	236	0.878	306
27	0.76	97	0.665	167	0.91	237	0.507	307
28	0.836	98	0.92	168	0.823	238	0.351	308
29	0.787	99	0.835	169	0.879	239	0.871	309
30	0.869	100	0.897	170	0.924	240	0.954	310

31	0.918	101	0.736	171	0.872	241	0.882	311
32	0.902	102	0.68	172	0.762	242	0.868	312
33	0.733	103	0.686	173	0.919	243	0.949	313
34	0.732	104	0.685	174	0.502	244	0.882	
35	0.7	105	0.692	175	0.877	245	0.918	
36	0.409	106	0.925	176	0.779	246	0.887	
37	0.641	107	0.912	177	0.817	247	0.918	
38	0.87	108	0.922	178	0.929	248	0.859	
39	0.518	109	0.913	179	0.854	249	0.86	
40	0.81	110	0.785	180	0.853	250	0.763	
41	0.687	111	0.804	181	0.763	251	0.863	
42	0.763	112	0.765	182	0.775	252	0.878	
43	0.762	113	0.929	183	0.926	253	0.885	
44	0.609	114	0.762	184	0.66	254	0.904	
45	0.69	115	0.764	185	0.921	255	0.794	
46	0.76	116	0.756	186	0.684	256	0.797	
47	0.705	117	0.766	187	0.807	257	0.887	
48	0.403	118	0.548	188	0.919	258	0.862	
49	0.222	119	0.75	189	0.801	259	0.865	
50	0.686	120	0.676	190	0.911	260	0.861	
51	0.679	121	0.773	191	0.752	261	0.859	
52	0.666	122	0.543	192	0.779	262	0.779	
53	0.686	123	0.671	193	0.823	263	0.903	
54	0.687	124	0.728	194	0.761	264	0.905	
55	0.628	125	0.856	195	0.933	265	0.858	
56	0.282	126	0.573	196	0.673	266	0.83	
57	0.47	127	0.943	197	0.773	267	0.829	
58	0.383	128	0.78	198	0.918	268	0.901	
59	0.3	129	0.684	199	0.778	269	0.863	
60	0.312	130	0.778	200	0.772	270	0.895	
61	0.762	131	0.673	201	0.699	271	0.762	
62	0.361	132	0.69	202	0.703	272	0.765	
63	0.762	133	0.755	203	0.721	273	0.673	
64	0.6	134	0.737	204	0.824	274	0.754	
65	0.705	135	0.838	205	0.743	275	0.757	
66	0.945	136	0.689	206	0.763	276	0.887	
67	0.857	137	0.863	207	0.677	277	0.869	
68	0.884	138	0.696	208	0.765	278	0.688	
69	0.678	139	0.566	209	0.705	279	0.858	
70	0.695	140	0.628	210	0.763	280	0.757	

FI= Farmer identity; AE= Allocative Efficiency

Source: Own computation, (2021)

Table 8. Small household farmer's allocative efficiency.

Economic efficiency

FI	EE	FI		FI		FI		FI	
1	0.342	71	0.41	141	0.41	211	0.613	281	0.612
2	0.187	72	0.441	142	0.453	212	0.656	282	0.611
3	0.363	73	0.412	143	0.617	213	0.465	283	0.674
4	0.386	74	0.611	144	0.412	214	0.41	284	0.689
5	0.363	75	0.411	145	0.212	215	0.501	285	0.657
6	0.344	76	0.41	146	0.41	216	0.442	286	0.412
7	0.322	77	0.41	147	0.411	217	0.489	287	0.434
8	0.356	78	0.41	148	0.432	218	0.456	288	0.456
9	0.421	79	0.401	149	0.412	219	0.486	289	0.41
10	0.311	80	0.411	150	0.207	220	0.456	290	0.87
11	0.419	81	0.412	151	0.41	221	0.435	291	0.645
12	0.311	82	0.212	152	0.321	222	0.873	292	0.654
13	0.399	83	0.21	153	0.231	223	0.632	293	0.613
14	0.587	84	0.562	154	0.272	224	0.853	294	0.645
15	0.512	85	0.534	155	0.443	225	0.654	295	0.645
16	0.408	86	0.569	156	0.389	226	0.843	296	0.632
17	0.408	87	0.221	157	0.564	227	0.211	297	0.612
18	0.409	88	0.421	158	0.266	228	0.843	298	0.632
19	0.396	89	0.41	159	0.567	229	0.821	299	0.615
20	0.388	90	0.417	160	0.27	230	0.785	300	0.623
21	0.351	91	0.773	161	0.542	231	0.83	301	0.675
22	0.305	92	0.61	162	0.453	232	0.85	302	0.654
23	0.41	93	0.611	163	0.423	233	0.675	303	0.658
24	0.754	94	0.41	164	0.432	234	0.642	304	0.61
25	0.416	95	0.412	165	0.456	235	0.811	305	0.612
26	0.419	96	0.606	166	0.453	236	0.811	306	0.413
27	0.465	97	0.41	167	0.567	237	0.108	307	0.425
28	0.521	98	0.578	168	0.456	238	0.114	308	0.452
29	0.552	99	0.567	169	0.546	239	0.81	309	0.432
30	0.546	100	0.61	170	0.612	240	0.89	310	0.421
31	0.565	101	0.589	171	0.621	241	0.675	311	0.423
32	0.562	102	0.412	172	0.61	242	0.811	312	0.13
33	0.412	103	0.412	173	0.653	243	0.897	313	0.615
34	0.554	104	0.41	174	0.107	244	0.679		
35	0.553	105	0.414	175	0.545	245	0.654		
36	0.234	106	0.61	176	0.456	246	0.632		
37	0.412	107	0.456	177	0.453	247	0.654		
38	0.61	108	0.369	178	0.564	248	0.612		
39	0.342	109	0.567	179	0.51	249	0.653		
40	0.599	110	0.432	180	0.532	250	0.611		
41	0.41	111	0.456	181	0.61	251	0.612		
42	0.41	112	0.421	182	0.612	252	0.623		
43	0.61	113	0.511	183	0.615	253	0.632		

44	0.372	114	0.61	184	0.41	254	0.81		
45	0.554	115	0.61	185	0.613	255	0.61		
46	0.456	116	0.457	186	0.41	256	0.612		
47	0.423	117	0.612	187	0.473	257	0.632		
48	0.205	118	0.221	188	0.652	258	0.661		
49	0.11	119	0.456	189	0.532	259	0.663		
50	0.412	120	0.412	190	0.568	260	0.659		
51	0.41	121	0.61	191	0.601	261	0.612		
52	0.4	122	0.201	192	0.432	262	0.623		
53	0.412	123	0.409	193	0.456	263	0.643		
54	0.41	124	0.431	194	0.412	264	0.645		
55	0.41	125	0.465	195	0.507	265	0.657		
56	0.123	126	0.234	196	0.41	266	0.634		
57	0.21	127	0.386	197	0.61	267	0.635		
58	0.213	128	0.412	198	0.612	268	0.81		
59	0.121	129	0.423	199	0.621	269	0.799		
60	0.132	130	0.474	200	0.61	270	0.81		
61	0.61	131	0.41	201	0.41	271	0.61		
62	0.213	132	0.413	202	0.412	272	0.619		
63	0.61	133	0.426	203	0.423	273	0.41		
64	0.211	134	0.413	204	0.456	274	0.61		
65	0.564	135	0.343	205	0.453	275	0.611		
66	0.378	136	0.413	206	0.611	276	0.816		
67	0.456	137	0.689	207	0.41	277	0.81		
68	0.534	138	0.416	208	0.61	278	0.419		
69	0.407	139	0.231	209	0.41	279	0.657		
70	0.41	140	0.256	210	0.609	280	0.612		
FI= Farmer identity; EE= Economic Efficiency **Source:** Own computation, (2021)									

Table 9. Small household farmer's economic efficiency.

Age group	Male	Female
<10	0	0
13-Oct	0.2	0.2
14-16	0.5	0.4
17-60	1	0.8
>60	0.7	0.5
Source: Bekele Hundie, 2001; cited in Muhammed, 2011		

Table 10. Conversion factors used to estimate man/adult equivalent.

Animals	Livestock units	Animals	Livestock units
Heifer	0.75	Donkey (young)	0.35
Calf	0.25	Camel	1.25
Weaned calf	0.34	Sheep and goat (adult)	0.13
Cow and oxen	1	Sheep and goat (young)	0.06
Horse	1.1	Chicken	0.013
Donkey (adult)	0.7		

Source: Storck et al.			

Table 11. Conversion factor for livestock unit.

Appendix 2: Survey questionnaire

"Economic efficiency of common bean production: - The case of Burji District, South Nation National Peoples Regional State, Ethiopia"
Prepared by: Chanyalew Malle, University of Gondar- Department of Agricultural Economics

Purpose: This questionnaire is prepared to collect data pertaining to technical, allocative and economic efficiency of common bean production in Burji District, South Nation National Peoples Regional State. It provides major inputs for Master‟s thesis and it is purely conducted for academic purposes. Therefore, the respondent is kindly requested to provide his/her valid response to the sets of question included in the questionnaire.
All your responses remain confidential.

Kebele-Signature- Questionnaire Id.no.

1. Demographic Characteristics of the Household

1.1. Name of the household head kebele gote_

1.2. Age (years) Sex: 1=male 0=female

1.3. Marital Status: 1= Married 2= Unmarried (single) 3= Divorced

1.4. Educational level of household: 1= Illiterate 2= Read and write 3= Grade

1.5. Religion: 1= Orthodox 2= Protestant 3= Muslim 4= Others

1.6. Number of years since started common bean production years.

1.7. Family size of the household head

Age	Male	Female	Number of family size
<10			
10-13			
14-16			
17-60			
>60			

1.8. Did you visit extension agent during the production of common bean in this year? 1=yes 0=no

1.8. If yes in no 1.8, how often do you visit extension workers during common bean production season?

1. Weekly 2. Monthly 3.Quarterly 4.Yearly 5.Not at all 6. Others

1.9. Did you get any training related too common bean production and marketing? 1=yes 0=no

2. Livelihood source and livestock holding of the household

2.1. The major annual crop produced by the household head and the area coverage in hectare.

No	Types of crop	Area coverage (ha)	Remarks
1	Common bean		
2	Teff		
3	Maize		
4	Wheat		
5	Barley		
6	Sorghum		
7	Chickpea		
8	Others		

2.2 Total number of livestock holding by the household head.

No	Types of Animals	No. of Animals	No	Types of Animals	No. of Animals
1	Ox		6	Goat/sheep	
2	Cow		7	Hen/chicken	
3	Calve		8	Bull	
4	Donkey		9	Mule/Horse	
5	Donkey young		10	Others	

3. Information Regarding Income of the Household

3.1. Did you participate in off/nonfarm activities? 1. Yes 0. No

3.2. Did anyone of your family member participates in off/nonfarm income? 1. Yes 0. No

3.3. What are the main sources of off/non-farm income for you and your family? If any

No	Source	Number of people engaged	number of days worked in a month	Income per working day	Total annual income from off farm activity
1	Wage				
2	Selling local drink				
3	selling fire wood				
4	Handicraft				
5	Pension payments				
6	Ceramic				
7	Carpenter				
8	Rent from assets				
9	Trading				
10	Clothes making				
11	Hired in other farm				
12	Remittance				
13	Other				

3.4. Why some members of your family are engaged in off farm activities? 1. Shortage of land 2, excess family labor 3, attractive income from off-farm activities 4, other specify

3.5. Annual income from agricultural production

A. Perennial crops and annual income

No	Type of perennia lcrop	number of trees	unit measurement	Amount produced	Quantity sold (if any)	Unit price	Total value
1							
2							
3							
4							
5							
6							
7							

Annual crops produced and annual income.

A. Annual crops produced and annual income

No	Type o fannual crop	Area (ha)	Quantity produced (qt)	Quantity sold (in qt.), if any	Unit price	Total value
1						
2						
3						
4						
5						
6						
7						

Income from the sale of livestock

No	Livestock types	Total income
1		
2		
3		

4		
5		
6		

Land holding

Total land holding size in (hectare).

Land type	Area coverage in hectare
Cultivated	
Non-cultivated	
Rented	

Do you use improved common bean variety in 2020/21? 1. Yes 2. No

If yes in question no. 5 list the improved varieties that you used? __

If no in no. 5 why not used improved common bean varieties?

Lack of improved varieties in the area

Due to high price

Unable to access

Others

Do you use fertilizer for common bean production in the production year 2019/2020?

1. Yes 2.no

If say yes in question no. 8 what kinds of fertilizer do you use?

1. DAP 2. Urea 3.Compost 4.Manure 5.All 6. Others

If you say no in question no. 8, why not used fertilizer?

1. Too expensive 2. Not easily accessible 3. Not good for production 4. Other _____

The requirements/inputs for common bean production and their sources

Types of inputs used	Inputs	Source that you got	Sources
1	1. Improved seed	1	1.Agricultural office
2	2. Local seed	2	2.Market
3	3. Fertilizers	3	3.Cooperatives
4	4. chemicals	4	4.NGOs (specify)
5	5. farm implements	5	5.reaserch center
6	6. others (specify)	6	6.Others

Are you members of the rural Agricultural Association/cooperatives? 1. Yes 0. No.

Distance from cooperatives to your home_____km

Do you use common bean sowing in line? 1. Yes 0. No.

If you say no in question 14 why not sowing in line?

1. Too much bulky 2. Not good for production 3. No better than common 4. Others

For how many times you prepare the land for common bean before sowing? 1=one times2=two 3=three.

How many you plow the land for common bean production_?

Does your land is new that use for the production of common bean in the last year?

1. Yes 0. No.

If no in question 18, what is the preceding crop_____?

Production cost and inputs used for the production of common bean

Types of inputs	Unit	Quantity	Unit Price	Total Cost
Seed	Local seed	Kg		
Fertilizer	DAP	Kg		
Organic fertilizer	Compost	Kg		
	Manure	Kg		
Chemical	Pesticide	Liter		
	Insecticide	Liter		
Oxen power	Own oxen	ODE		
	Rental	ODE		
Labor	Family labor	MDE		

	Hired labor	MDE		
Land	Own land	Ha		
	Rental land	Ha		

Human labor and oxen power (pair of oxen) used for common bean production in 2019/20?

Activities	Human labor									Oxen
	Family labor				Hired labor			Debo		power /in pair
	Days/hour	Sex		Age	Sex		Age	Sex		Age
		Male	Female		Male	Female		Male	Female	
Preparation of land before plough										
	1st									
	2nd									
	3rd									
	4th									
Sowing										
Weeding	1st									
Chemical application	2nd									

Coding: - Age; 0 if <10, 1=10-13, 2=14-16, 3=17-60 & 4= more than 60

Do you have access to credit for the last years‟ for common bean production? 1=yes 0=no

If yes, no.22 what is the source of credit do you have in the production of common bean in2019/20?

No.	Sources of credit	Yes=1	No=0	No.	Sources of credit	Yes=1	No=1
1	Bank			5	Traders/money lenders		
2	Omo-microfinance			6	Equb		
3	Cooperatives			7	Friends/relatives		
4	NGOs			8	Others		

How much many did you borrow in the production of common bean (2019/20)__in birr?

Distance from the nearest market_____in km.

What is the soil fertility status of your cultivated land? 1. Fertile 0. Non-fertile

What is the slope of your land? 1. Flat 0. Gentle

How many quintals of common bean did you produced in year 2019/2020 _____(quintals)?

What are the main obstacles/problems in the production of common bean in 2019/2020?

No.	Obstacles/problems	Yes=1	No=0	No.	Obstacles/problems	Yes=1	No=0
1	Shortage of land			5	Shortage of credit access		
2	Low fertility of the soil			6	Shortage of rain		
3	Shortage of labor			7	Others		
4	Marketing access						

Is there any disease occurred on your common bean production in this year? 1= yes 0= no.

If yes in no. 30, what are the disease occurred on your production of common bean?1=insects 2=bacteria 3= fungi 4=leaf rust 5= others specify