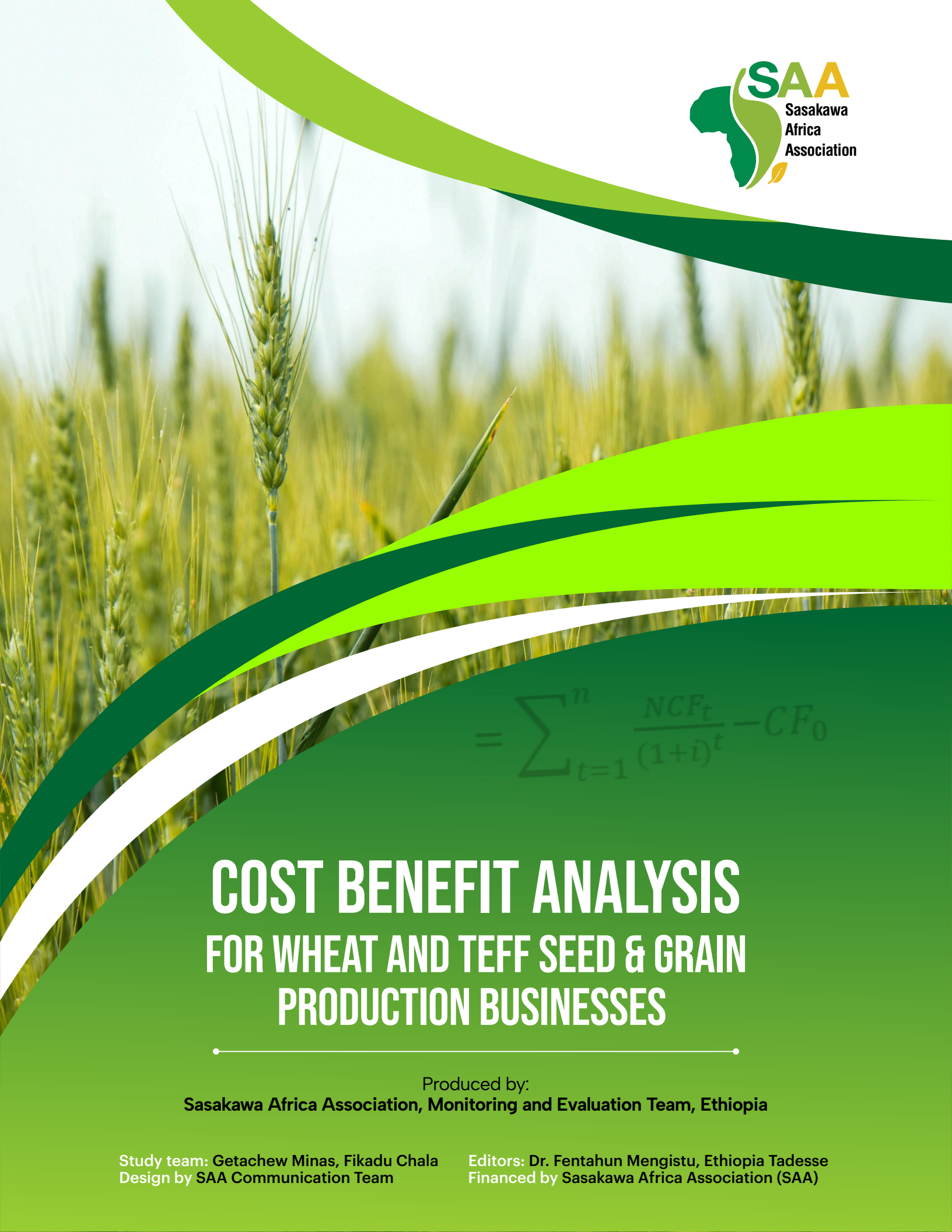

COST BENEFIT ANALYSIS

FOR WHEAT AND TEFF SEED & GRAIN PRODUCTION BUSINESSES

Produced by:
Sasakawa Africa Association, Monitoring and Evaluation Team, Ethiopia

Study team: Getachew Minas, Fikadu Chala
Design by SAA Communication Team

Editors: Dr. Fentahun Mengistu, Ethiopia Tadesse
Financed by Sasakawa Africa Association (SAA)


Volunteers

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$$= \sum_{t=1}^{n} \frac{NCF_t}{(1+i)^t} - CF_0$$

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1. INTRODUCTION

In Ethiopia, two broad types of seed system are operating: the formal and the informal seed system (sometimes called local or farmers' seed system). Both systems are operating simultaneously in the country and difficult to demarcate between the two. There is, however, a fact that the formal system is the original source of improved seeds for the informal system. Other forms of seed systems operating in both systems also exist such as Community-Based Seed System (CBSS). Though not well developed, few commercial seed systems, as part of the formal system, are also operating in the country (MoA and ATA, 2017).

Production of seed is largely supply-driven, even for those small-scale domestic private seed producers who directly sell their seed. Given the subsistence nature of agriculture in Ethiopia, seed production is geared towards meeting the needs of subsistence agriculture and is not well linked with the current government strategies (Agricultural Commercialization Cluster (ACC), export market and agro-industrial parks) for agricultural commercialization. Since seed production is largely through out-growers, the production system remains traditional and less mechanized. In addition, management of out-growers' schemes with smallholders are challenging in terms of maintaining the seed quality, trust, and price setting relative to grain price (MoA, 2018b).

Access to good seeds is fundamental for smallholder farmers' crop production and resilience in the face of environmental change and disasters. If good quality seed is not used, there is a large yield gap between the actual and potential production level that should be taped. Studies have shown that pure seed of improved varieties can increase yields by between 24% and 54% in cereals and legumes and 15% to 131% in cassava and sweet potato compared with traditional varieties (Solbreck, 2017). Therefore, the use of good quality improved seed varieties is widely recognized as fundamental to ensure increased crop production and productivity. Other potential benefits accrued to farmers from good quality seed include: high yield index, reduced risks from pest pressure, and high incomes (FAO, 2004). The availability of quality seed to farmers is, therefore, key to food security and agricultural development, especially in Sub-Saharan Africa.

Despite the benefits of using improved varieties, availability of quality seed in sufficient quantities is a challenge in Ethiopia because of low level of seed production, and high cost of seed multiplication and distribution. Seed diffusion is often slow with the major reasons being low levels of seed replacement, poor seed quality and low adoption of recommended agronomic practices (Gerpacio and Pingali, 2007).

To address this low level of seed replacement and increase adoption of recommended good agronomic practices, SAA has introduced community-based seed multiplication (CBSM) Model in its technology and extension intervention strategy. CBSM approach has also been used by agricultural research and development actors to improve farmers' access to quality seed.

SAA has also considered the CBSM schemes as agri-business enterprises so that it has been working on entrepreneurs' capacity enhancement intervention schemes such as market assessment, enterprise selection, business plan preparation, record keeping, financial management, partnership formation, market negotiation and bargaining power skill development related essentials. It is believed that these interventions enhanced the profitability of the business enterprises so that to enable them operating the business in a sustainable manner. Therefore, the main objective of this study was to assess the profitability of teff and wheat seed and grain production and marketing business operated by SAA supported farmers/seed producers in four of its intervention woredas (Andabet, Gozamen, Angacha, and Ana Sora) of Amhara, Oromia and SNNP regions in Ethiopia.

2. OBJECTIVES OF THE STUDY

The general objective of the study is to explore the costs and benefit of the seed production and marketing business operated by SAA supported seed producers in Amhara, Oromia and SNNP regional states of Ethiopia.

The specific objectives:

i) To study the profitability of teff and wheat seed production and marketing business enterprises owned by smallholder farmers in SAA intervention areas of Amhara, Oromia and SNNPR.

ii) To compare the profitability of the seed production business with the grain production and marketing business.

iii) To identify the existing challenges that hampers to adopt effective business enterprises.

3. METHODOLOGY

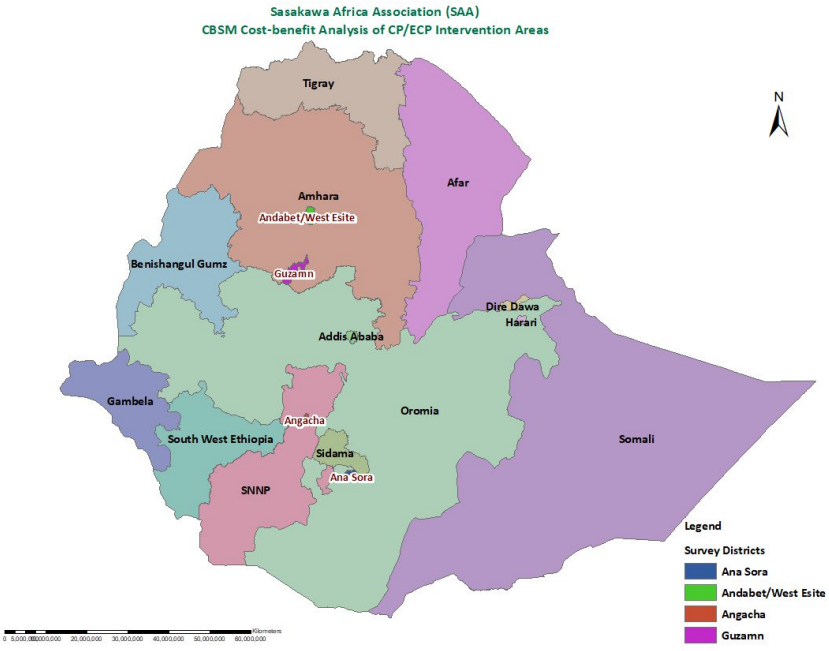

Figure 1: ***Map of the study areas***

3.1 Description of the Study Area

This study was conducted in four districts (Gozamen and Andabet Woreda of Amhara region, Ana Sora Woreda in Oromia region, and Angacha Woreda in SNNPR) (Figure 1).

Gozamen and Andabet Woredas are located at a distance of 305 and 605 Km to the Northwest direction of Ethiopia with a GPS reading of 10.33607, 37.72500, and 11.77493, 38.12707. Ana Sora and Angacha Woredas are placed at a distance of 472 Km and 255 Km, respectively, from Addis Ababa to the South of Ethiopia with GPS reading of 5.86973, 38.97269, and 7.36045, 37.85431.

3.2. Sample Size and Sampling Method

A total of four seed producer groups (one teff and three wheat) in the four woredas (Andabet, Gozamen, Ana Sora, and Angacha) were selected for conducting the study. The seed producers were selected purposively in terms of area of operation as well as the type of enterprise they have been operating. However, the individual farmers were selected randomly from the list of members of the seed producer groups. Overall, 170 (4 female) seed producers were participated in the individual household survey. Moreover, four Focus Group Discussions (FGD), one FGD in each seed production business enterprises with 8 to 12 members were participated during the data collection period.

3.3. Data Collection Method and Tools

Primary data were collected with structured and semi-structured data collection tools, which were designed ahead of the data collection period. The tools were designed to extract both qualitative and quantitative data from the different CBSM business enterprises, smallholder farmers and Extension Agents (EAs). Primary data were collected through individual household survey and FGD data collection methods, whereas secondary data were collected through document review. The data were consisted of investment costs including land preparation, fertilizers, seed, agro-chemicals, weeding, harvesting, threshing and transportation costs. In addition, production and productivity of the commodities, market price and revenue of the business were captured to calculate the costs and benefits of the business enterprises. Land and family labor were not considered as the costs of the business because they were the farmers' own resources and had no records in the cash flow recording data of the business enterprises.

3.4. Data Analysis

Data analysis was carried out using Statistical Package for Social Science (SPSS) data analysis software,and excel spreadsheet and pivot table data visualization tools. Descriptive statistical analysis such as percentage, mean, minimum and maximum measurements were used to gage the status of the business with quantitative parameters. Discounted economic measurement parameters such as Net Present Value (NPV), Benefit Cost Ratio (BCR), and Return on Investment (ROI) were used for examining the profitability and feasibility of the business. In addition, business sensitivity analysis was made in four scenarios to show the responsiveness of the business/its resilience in the changing business environment. Tables and graphical presentations also used to present the different statistical results.

The statistical formula for discounted economic measurement parameters and their definitions are described below.

Net Present Value (NPV) is a capital budget technique used to determine the present value of discounted future payments at an appropriate rate [5]. This was used to calculate the difference between the present value of net cash inflows and outflows, using the following formula:

$$NPV = -CF_0 + \frac{NCF_{t1}}{(1+i)^{t1}} + \frac{NCF_{t2}}{(1+i)^{t2}} + \cdots + \frac{NCF_{tn}}{(1+i)^{tn}} \quad \text{..... (1)}$$

$$NPV = -CF_0 + \sum_{t=1}^{n} \frac{NCF_t}{(1+i)^t} \quad \text{.....(2)}$$

Or, this can be written in the form of:

$$NPV = \sum_{t=1}^{n} \frac{NCF_t}{(1+i)^t} - CF_0 \quad \text{..... (3)}$$

Where: NPV = net present value; NFC_t =net cash flow during the period t; CF_0 initial investment/cost; t = the period in year; i=discount rate; n=duration of the project.

According to Julian and Seavert, 2011, the NPV rule should be used to make decisions on the investment. When NPV < 0, investment should be rejected, when NPV > 0, investment should be accepted. The NPV equation considers all the costs and desired rates of return. Therefore, investing in something that has a net present value greater than zero logically increases a company's earnings since it achieves the expected financial objectives.

Benefit Cost Ratio (BCR) is the ratio of project benefits versus project costs. It involves summing the total discounted benefits for a project over its entire duration/life span and dividing it over the total discounted costs of the project (Gerald. S and Marta. G, 2012).

$$B/C = \frac{\sum_{j=1}^{n} Rj\,(1+i)^j}{\sum_{j=1}^{n} Cj\,(1+i)^j}$$

Where: B/C=cost benefit ratio; Rj = revenues during the period j; Cj = costs during the period j; i=discount rate.

Return On Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio (Return on Investment – ROI, 2011). It is expressed by the following formula:

$$ROI = \frac{\text{Bussiness Revenue} - \text{Invesment Cost}}{\text{Invesment Cost}}$$

4. RESULTS & DISCUSSION

4.1. Demographic Characteristics

This section describes the average age and gender composition of the respondents, education level of the respondents, and family size of the respondents.

4.1.1. Age and sex of respondents

The average age of the overall respondents was 41 with the female respondents at the age of 39 and that of the male respondents were at the age 41. The highest mean age of the respondents was 46 years which was in Angacha woreda followed by Andabet woreda with the age of 45 years, on the average. Whereas, the seed business entrepreneurs in Gozamen woreda were found with the youngest of all entrepreneurs with the average age of 25. Regarding gender participation, female respondents accounted for only 2% of the overall Interviewee who had been participated during the survey. Relatively, Angacha and Gozamen Woredas had better participation of female entrepreneurs with a proportion of 7% and 4% of the total respondents, respectively.

Table 1: **Age and sex of respondents**

	Andabet			Gozamen			Anna Sora			Angacha			Total		
Sex	Count	%	Age	Count	%	Age	Count	%	Age	Count	%	Age	Count	%	Age
Female	1	1%	60	1	4%	26	0	0%		2	7%	35	4	2%	39
Male	98	99%	45	22	96%	25	18	100%	33	28	93%	46	166	98%	41
Total	99	100%	45	23	100%	25	18	100%	33	30	100%	46	170	100%	41

Source: Cost benefit assessment analysis result

4.1.2 Education level of the respondents

The level of education and business experience on business performance of an owner/manager has been the subject of much discussion and speculation in both the popular and academic press.The educational achievement of owner/managers is associated with their persistence, motivation, and self-discipline (Bird, Sapp & Lee, 2001). These qualities, in turn, might be expected to increase SMEs' ability to performance. The influence of education on performance lies in the fact that knowledge gained enhances the managerial capacity to develop a superior business for an industry-specific strategy (Bird, Sapp & Lee, 2001). Consequently, resources can be acquired more efficiently, costs are reduced, and revenues are increased.

In this study, about 28% of the overall respondents had no literacy and numeracy experience in their life, and 17.1% of the respondents attended only their basic education class through religious education centers. About 37% and 13% of the entrepreneurs were literate with primary (grade 1-8) and secondary (grade 1-12) level of education, respectively. Only 4% of the entrepreneurs had attended tertiary level of education (College diploma and Degree), who are mainly found in Ana Sora and Angacha Woredas.

Table 2: **Education level of the respondents**

	Andabet		Gozamen		Anna Sora		Angacha		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
Illiterate	44	44.4%	1	4.3%	2	11.1%	1	3.3%	48	28.2%
Religious	28	28.3%	0	0.0%	0	0.0%	1	3.3%	29	17.1%
Grade 1-8	20	20.2%	19	82.6%	7	38.9%	18	60.0%	64	37.6%
Grade 9-12	7	7.1%	3	13.0%	6	33.3%	6	20.0%	22	12.9%
Vocational	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Tertiary	0	0.0%	0	0.0%	3	16.7%	4	13.3%	7	4.1%
Total	99	100.0%	23	100.0%	18	100.0%	30	100.0%	170	100.0%

Source: Cost benefit assessment analysis result

4.1.3. Family size of the households

The average family size of the overall respondents was found 5.1 with a range of 2.5 in Gozamen woreda to 7.5 in Angacha woreda. Angacha and Ana Sora woreda had a family size above the average family size of the overall respondents, even from the average family size of the country, which is 4.6 (UN, 2019).

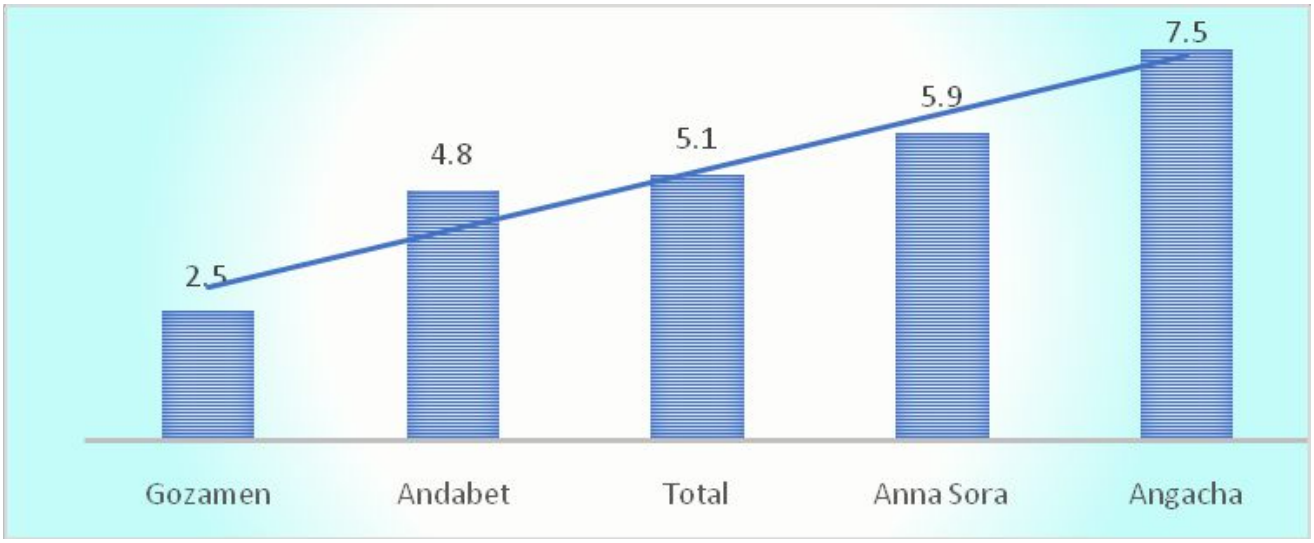

Figure 2: **Average family size of respondents**

4.2 Production Costs

4.2.1 Teff production costs

In this assessment, all production costs paid in cash are considered, non-cash costs, however, are not considered in the expense line item, i.e., family labor, and land owned by the households. According to the analysis result, farmers who were engaged in teff seed production business incurred 9678.4 Birr per hectare of land, on the average. However, teff grain production costed 9071.3 Birr, which is lower than the seed production cost by 7.7%.

For teff seed production business, the highest share of the overall production cost was accounted for fertilizer expenses, which was 70% of the total production cost of the enterprise. The second highest production costs followed to fertilizer cost was reported to the cost of seed and land preparation, which had the share of 11% for each of them over the total production cost. Similarly, in teff grain production, fertilizer cost took the highest share of the total production cost with a share of 67% of the total cost, followed by seed cost, which had a share of 20% of the total production cost.

Table 3: **Teff seed and grain production costs per hectare of land**

List of costs	Production Costs			
	Teff seed	%	Teff grain	%
Seed	1082.0	11%	1817.7	20%
Fertilizer	6817.5	70%	6062.8	67%
Herbicide	204.1	2%	308.1	3%
Pesticide	154.1	2%	165.3	2%
Land Preparation	1027.0	11%	260.0	3%
Weeding	172.2	2%	196.5	2%
Harvesting	221.6	2%	260.9	3%
Threshing	0.0	0%	0.0	0%
Total	9678.4	100%	9071.3	100%

Source: Cost benefit assessment analysis result

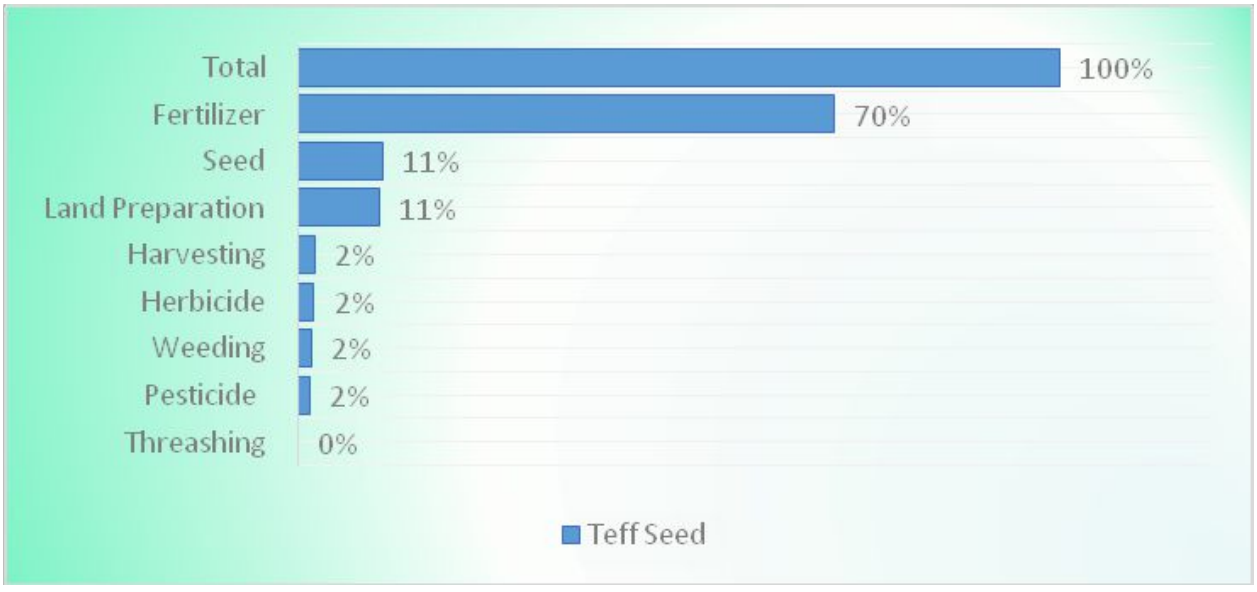

Figure 3: **The share of teff seed production costs over the total production cost.**

4.2.2. Wheat seed and grain production costs

The list of wheat seed and grain production costs and the share of each cost items over the total production cost are indicated in Table 4. Relative to wheat seed production costs, fertilizer had the highest share of all production costs followed by seed cost, which were accounted for 37% and 26% of the total cost of production, respectively. In wheat grain production, however, the seed input cost had the highest share of all cost items followed by fertilizer cost, which had the share of 47% and 36% of the total production costs. In this case, 83% of the grain production cost was devoted to seed and fertilizer production inputs, while in seed production these inputs had a share of only 63% of the total production costs. For wheat seed production, next to these two production inputs, herbicide cost was the third significant cost of all of the production costs, which was accounted for 14% of the total cost. On the other hand, weeding and threshing costs had the lowest share of all costs as shown in Table 4 and Figure 4. Regarding wheat grain production, land preparation, weeding and threshing were among the lowest cost of production inputs applied by the smallholder farmers (Table 4).

Table 4: **Summary of wheat seed and grain production costs ha^{-1}**

List of costs	Gozamen		Anna Sora		Angacha		Total			
	Wheat seed	Wheat grain	Wheat seed	Wheat grain	Wheat seed	Wheat grain	Wheat seed	%	Wheat grain	%
Seed	4708.7	5904.8	3728.2	3795.0	2530.0	4548.7	3059.1	26%	4971.2	47%
Fertilizer	5038.9	4749.2	2786.0	1433.8	5400.8	4612.8	4425.5	37%	3845.8	36%
Herbicide	197.0	458.8	1594.4	377.2	1864.6	552.7	1697.3	14%	464.1	4%
Pesticide	157.6	324.7	729.4	534.7	724.6	597.1	703.2	6%	456.5	4%
Land Preparation	0.0	55.9	0.0	0.0	1172.4	46.2	693.9	6%	38.6	0%
Weeding	0.0	0.0	0.0	0.0	124.1	0.0	73.5	1%	0.0	0%
Harvesting	2625.0	1040.6	985.7	441.7	517.2	353.8	775.4	7%	690.3	7%
Threshing	2625.0	0.0	877.6	441.7	41.4	0.0	454.0	4%	115.2	1%
Total	15352.1	12534.1	10701.3	7024.0	12375.2	10711.4	11881.8	100%	10581.6	100%

Source: Cost benefit assessment analysis result

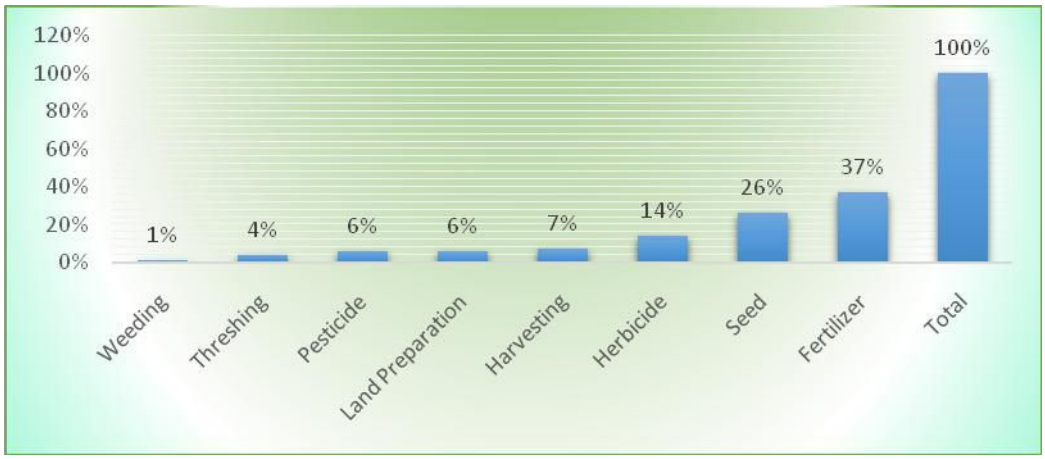

Figure 4: **Share of wheat seed production costs**

4.3. Size of Land and Productivity of Wheat and Teff

Productivity and profitability are important concepts and measures, which describe the performance and successfulness of a business enterprise. Common sense tells us that there has to be a relationship between these two. Though the total factor productivity measurement is required whether to judge a business enterprise is profitable, we can acknowledge that an increase in productivity of a firm decreases the cost per unit of production, which then leads to better profitability (Kaplan and Atkinson, 1989).

When it comes to the subject under study, generally each of the respondents dedicated 0.61 hectare of land for wheat seed production scheme, whereas the teff seed producer farmers employed only 0.39 hectare of land, on the average. Regarding grain production, farmers devoted 0.95 hectare of land for grain production while they dedicated only 0.44 hectare of land for wheat seed production business in the same commodity. The analysis result of the assessment revealed that the productivity of wheat seed production business was 2220 kg/ha of land, which was slightly higher than that of the grain production (2190 kg/ha).

The highest productivity per hectare of land was reported by respondents in Gozamen Woreda with an average productivity of 3912 kg per hectare, and that of the lowest was reported by Angacha Woreda with a volume of production of 2057 kg/ha. In the same manner, the productivity of teff was higher in seed production business compared to that of the grain production counterpart. On average, the productivity of teff in seed production business was 1467 kg/ha whereas the grain productivity was found to be 1290 kg/ha. (Table 5) (Figure 5).

[1] qt refers a 100 kg weight of the commodity

Table 5: **Average size of land and Productivity of wheat and teff in kg/ha**

	Andabet		Gozamen		Anna Sora		Angacha		Total	
	Area (ha)	Productivity	Area (ha)	Productivity	Area (ha)	Productivity	Area (ha)	Productivity	Area (ha)	Productivity
Wheat seed			0.19	3912	0.66	2294	0.30	2057	0.61	2220
Wheat grain			0.51	2659	0.52	1675	0.26	1908	0.44	2190
Tef seed	0.39	1467							0.39	1467
Tef grain	0.95	1290							0.95	1290

Source: Cost benefit assessment analysis result

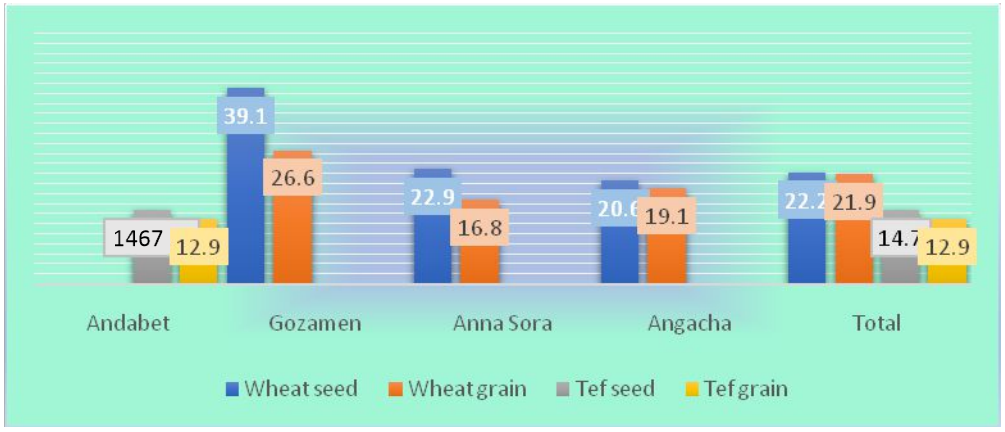

Figure 5 : **Productivity of teff and wheat seed and grain in qt /ha**

4.4 Proportion of Produced Seed Marketed by the Farmers

The proportion of seed sold by the farmers in related to the total volume of seed produced by the farmers is depicted in Table 6. Overall, 98% of the teff seed produced by the farmers was sold to the linked cooperative union with the agreed terms of payment. On the other hand, only 82% of the produced wheat seed was sold to the respective seed buyers/off takers, on the average. The seed producers in Angacha Woreda had the least proportion of the produced seed (61%) that was sold by the producer farmers through all means of marketing channels. The remaining portion (39%) of the seed produced was dedicated for household consumption and seed source for the coming production season (Table 6). Lack of seed collection center in the vicinity of seed producer farmers, lack of willingness of the union to collect seeds from farmers' residential places, failure to pay the premium price in accordance to the MoU signed between the two parties are the

major challenges reported by the seed producer farmers for low proportion of the seed marketed by the farmers. Seed producer farmers kept their seeds in their own houses until the due date of delivering it to their market partners. This may increase the probability of adulteration and seed quality deterioration.

Table 6: **Proportion of seed marketed against with the produced**

	Wheat seed			Tef seed		
	Quantity produced in qt	Quantity sold in qt	% Seed marketed	Quantity produced in qt	Quantity sold in qt	% Seed marketed
Andabet				5.46	5.35	98%
Gozamen	185.75	185.75	100%			
Anna Sora	14.69	10.36	70%			
Angacha	6.26	3.81	61%			
Total	16.68	13.64	82%	5.46	5.35	98%

4.5. Summary of Production Costs and Benefits

The overall seed production cost of teff was 9,678.00 Birr per hectare while that of the wheat was 11,882.00 Birr per hectare of land. The average revenue of teff seed producers was found to be Birr 68,388 whereas for wheat producer farmers it was Birr 81,346, on the average. The revenue in wheat seed production business differed from place-to-place ranging from 40,566.00 Birr in Angacha to Birr 143,626.00 in Gozamen. The net benefit result showed that the wheat seed producers in Gozamen Woreda generated the highest NPV of all entrepreneurs with a monetary value of 115,217.00 Birr. The lowest net profit of all seed enterprises was recorded for Angacha

wheat seed producer farmers with NPV of 24,503.00 Birr. Overall, the wheat seed producer farmers generated a net profit of 62,069.00 Birr with a BCR 6.2, and ROI 522%. When it comes to teff seed production business, the NPV of the business was found to be 52,493.00 Birr with a BCR value of 6.4, and ROI 542%.

According to the analysis result, wheat seed production business generated higher nominal profit than teff seed production business, but it required higher investment cost (11,882.00 Birr) compared to that of the teff seed production business, which required only 9678.00 Birr per hectare of land. However, the two enterprises had a reverse outcome when they were evaluated in other business performance measurement parameters such as CBR and ROI. Teff seed production business showed a better profitable business in both CBR and ROI business performance measurement parameters compared to that of the wheat seed production business (Table 7) Figure 6.

In general, in all profitability measurement parameters, seed production and marketing was a profitable business compared to that of the grain production and marketing business (Table 7).

Table 7: **Summary of cost–benefit analysis result**

Costs and Benefits	Andabet		Gozamen		Anna Sora		Angacha		Total			
	Tef seed	Tef grain	Wheat seed	Wheat grain	Wheat seed	Wheat grain	Wheat seed	Wheat grain	Tef seed	Tef grain	Wheat seed	Wheat grain
Total Cost	9678	9071	15352	12534	10701	7024	12375	10711	9678	9071	11882	10582
Total Revenue	68388	47890	143626	81540	59846	35131	40566	37723	68388	47890	81346	51465
PV of Cost	9678	9071	15352	12534	10701	7024	12375	10711	9678	9071	11882	10582
PV of Revenue	62171	43537	130569	74127	54406	31937	36878	34294	62171	43537	73951	46786
NPV	52493	34465	115217	61593	43704	24913	24503	23582	52493	34465	62069	36204
BCR	6.4	4.8	8.5	5.9	5.1	4.5	3.0	3.2	6.4	4.8	6.2	4.4
ROI	542%	380%	750%	491%	408%	355%	198%	220%	542%	380%	522%	342%

Source: Cost-benefit assessment analysis result

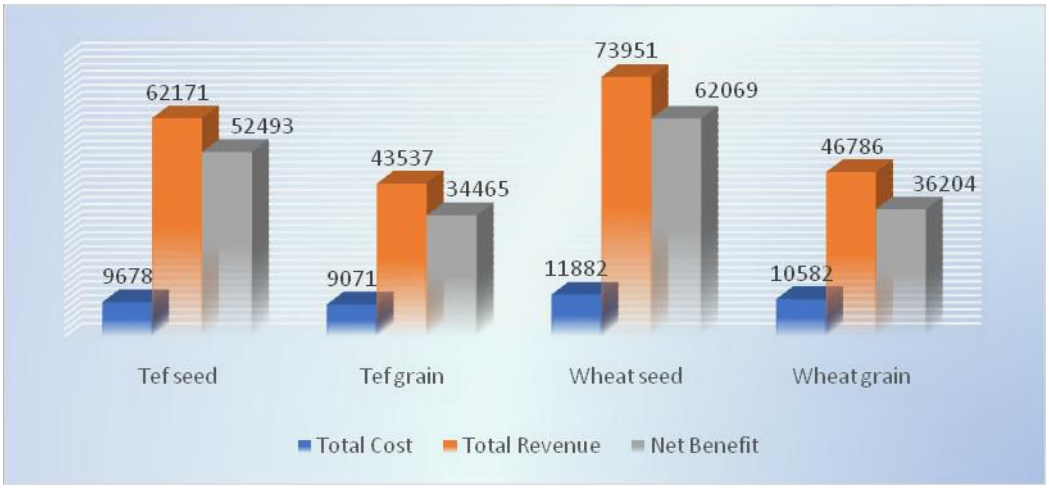

Figure 6: **Cost and benefit in Ethiopian Birr for teff and wheat seed and grain production business**

4.6 Sensitivity Analysis

In this study, a sensitivity analysis was made in four different scenarios: 10% decrease in productivity, 10% hikes in input price, 20% decrease in productivity, and a combination of 20% decrease in productivity and 10% price hikes in production inputs. Accordingly, the profitability of the seed production business for both teff and wheat was positive in all scenarios.

For instance, a 10% decrease in production will bring the ROI 391% for teff and 411% for wheat seed production business, which was still highly profitable business venture. As shown in Table 8, a 10% price hikes in production inputs and 20% production decrease will result the ROI value of 297% and BCR value 4.0 for teff, while 313% ROI and 4.1 BCR value for wheat seed production business enterprises. According to Yaser Saad (2015), sensitivity analysis allows to determine how the value of the independent variable will impact a particular dependent variable under a given set of assumptions.

This type of analysis to determine the most critical variables that have the greatest effect on the feasibility and effectiveness of the project. The sensitivity analysis serves assessment of the impact of changes of the input parameters; it is necessary to be able to predict the course of events in the business plan.

Table 8: **Sensitivity Analysis for teff and wheat seed production and marketing business**

List of costs	Current state		10% production decrease		20% production decrease		10% price hikes		10% price hikes, 20% production decrease	
	Teff	Wheat	Teff	Wheat	Teff	Wheat	Teff	Wheat	Teff	Wheat
Cost of production	9678.4	11881.8	9678.4	11881.8	9678.4	11881.8	10646.2	13070.0	10646.2	13070.0
Production/ha	14.7	22.2	13.2	20.0	11.7	17.8	14.7	22.2	11.7	17.8
Market price	4662.6	3664.9	4662.6	3664.9	4662.6	3664.9	4662.6	3664.9	4662.6	3664.9
Revenue	68388.4	81346.0	61549.6	73211.4	54710.7	65076.8	68388.4	81346.0	54710.7	65076.8
PV cost	11393.5	13030.9	11393.5	13030.9	11393.5	13030.9	12532.8	14334.0	12532.8	14334.0
PV revenue	62171.3	73950.9	55954.1	66555.8	49737.0	59160.7	62171.3	73950.9	49737.0	59160.7
NPV	50777.8	60920.0	44560.7	53524.9	38343.6	46129.8	49638.5	59616.9	37204.2	44826.7
BCR	5.5	5.7	4.9	5.1	4.4	4.5	5.0	5.2	4.0	4.1
ROI	446%	468%	391%	411%	337%	354%	396%	416%	297%	313%

Source: Cost benefit assessment analysis result

4.7. Major Challenges Encountered in the Business

- Lack of keeping the binding agreement to act on in accordance with the MOU signed by the two parties. In seed marketing, both the buyers and sellers did not have firm stand to respect the binding agreements they have made. The buyers tried to buy the produced seed with a 15% premium price over the existing grain market price, but they always do that at the harvesting season when the price of the grain is at the lower bottom. This causes a grievance in the farmers side, and they prefer to store the produced seed a while and to sell to their fellow farmers in the informal market.
- Farmers used the seed as a grain for household consumption. This is the most devastating act which is made by the seed producer farmers in the effort of agriculture development intervention. The basic seed was produced and given to the seed producer farmers with a high concern and efforts of the researchers, governmental and non-governmental development partners with a dedicated time, financial and human resources in

the sense of increasing production and productivity by increasing access to improved seed for the farming communities. However, some of the seed producer farmers engaged in seed production business with no extra land to produce grain for household consumption.

This leads them to use the produced seed for household consumption with the absence of knowledge how it brings a loss in the food security efforts of the country.

- Lack of seed collection center for seed producer farmers forced producers to kept their seeds in their own houses until the off takers collect the seed. This may increase the probability of adulteration and seed quality deterioration. Seed collection center could have served farmers as a a tentative storage where the seed can be kept safely until it is sold.

- The seed producer farmers had no contractual agreement either with the union or any research center for accessing basic seeds in annual basis. This may discourage the farmers from the seed production and marketing business in the future.

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