



Returns to the investment by the Arab Fund for Economic and Social Development (AFESD) on:

Enhancing Food Security in the Arab Countries (EFSAC) Project

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WORKING PAPER



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Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is a non-profit international organization undertaking people-centered research-for-development to provide innovative, science-based solutions to improve the livelihoods of communities across the non-tropical dry areas. In partnership with research institutions, governments, NGOs and the private sector, our work advances scientific knowledge, shapes practices, and informs policy.

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Introduction

The Arab countries of West Asia and North Africa (WANA) region are the center of origin, diversity and domestication of wheat, barley and food and forage legumes. Some of these countries were the world wheat basket for millennia. Nowadays Arab countries import at least 50 percent of the food calories they consume at a cost of over US\$12 billion (FAOSTAT, 2019), making them the most import-dependent countries in the developing world. According to the 2019 UN World population prospects, the total population of WANA countries is about 464.1 million (6% of the world population) and is projected to reach nearly 655 million by 2050 and to more than one billion in 2100 (DESAPD, 2019). The region's

population grew at the fastest rate in the world with an average rate of 1.91% annually from 2010 to 2019, compared to the world average of 1.16% per year (WB, 2020). The region is also considered the most water-limited in the world, where two-thirds of countries continue to use groundwater at rates exceeding the renewable internal freshwater resources. In the absence of appropriate interventions, all these facts indicate that the region's dependence on food imports will increase. Given that cereals are the main staple food in WANA, they play a central role in the food security of the region.

In the face of changing climate and the risk of greater dependence on imports for strategic commodities like wheat, it is imperative that climate-smart options to produce nutritious food are developed, demonstrated, and scaled. This is exactly what the project "Enhancing Food Security in the Arab Countries (EFSAC)" - partly funded by AFESD has been doing in 10 countries since 2011. The EFSAC project has focused on improving wheat production and yield in wheat-based agricultural systems through dissemination of improved and proven technologies and has been implemented in three phases. This focus has been implemented focusing on rainfed and irrigated production systems backed with capacity development, including training of young agricultural scientists. The project draws on major research achievements of ICARDA and NARS for sustainable intensification of wheat production and focuses on placing these research outputs in the hands of wheat growers.

The project aimed at a sizeable impact in terms of enhancing food security in the region besides expected impact of the project on natural resource conservation, adaptation to climate change and reducing negative environmental footprints of agriculture.

Figure 1. Enhancing Food Security in the Arab Countries Project Phase I - III – Timeline, budget, funding (and in-kind support) (EFSAC) Project has covered 10 countries over three phases.



Analysis of the Benefit:cost ratio for AFESD's investment during Phase II of the EFSAC project in five of the ten project countries

Scope of Analysis

The EFSAC project reports for Phase I and Phase II have documented sizeable impacts in each country focusing on the gains per unit area in terms of yield and amount of water saved particularly due to the adoption of the recommended irrigation regimes and the raised bed technology. While a formal and comprehensive impact assessment of the project is planned at the end of the 3rd phase of the project in 2022, this paper presents a careful estimation of the minimum impact of the EFSAC project in general and the contribution of AFESD in particular during Phase II of the project. This analysis covers only five of the project countries - Egypt, Jordan, Morocco, Sudan, and Tunisia and is based on data collected during the 3rd year of Phase II from these countries. The five countries represent rainfed (Morocco, Jordan and Tunisia) and full irrigated (Egypt and Sudan) wheat-based production systems.

Benefit-cost ratios (BCR)

AFESD has made a total investment of US\$2.01 million during the 2nd phase of the EFSAC project. Out of this total investment, US\$1.2 million was allocated to Egypt, Jordan, Morocco, Sudan, and Tunisia included in the study.

An average of **24% of the farm households in the project areas in all the five countries** adopted new improved wheat varieties along with at least two of the other components of the technology packages introduced by the EFSAC project. On average, at least **73% of the adoption level that has been achieved in the 4-year of Phase II** of the project in all five countries is attributed to the investment made by the EFSAC project (Table 1). This translates to an **adoption level of 17.7%** ($73\% \times 24.35\%$) of the total 1.3 million ha of wheat in the governorates covered by the project, i.e., **231 thousand ha of wheat area** is covered by improved wheat varieties and at least 2 other components of the technology package disseminated by the project. The adoption of the varieties and at least 2 other components led to an **average yield gain of 436 kg/ha valued at US\$ 130.82/ha**. As a result, under three (conservative, modest and optimistic) scenarios, the technologies promoted through the EFSAC project directly benefited between 154 – 183 thousand farm households supporting between 0.89 and 1.06 million people (Tables 2-4). Given that the **share of AFESD in the total investment made by the EFSAC project was about 35%**, the **total benefits reaped by 53 – 63 thousand families supporting a total population of 311-**

Best bet technology packages promoted by ICARDA and NARS for wheat production

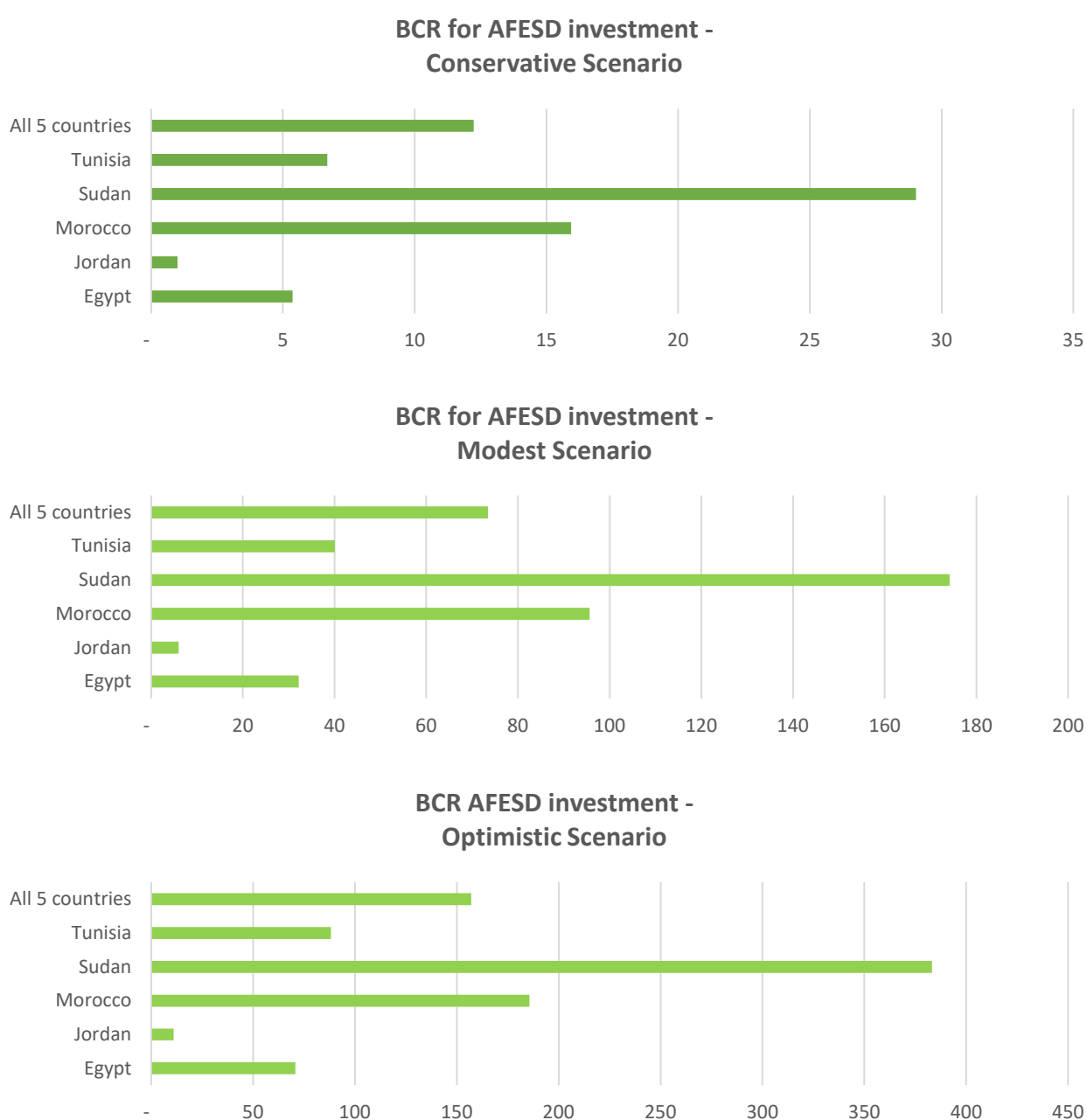
- Improved durum and bread wheat varieties
- Land preparation
- Seeding rate and planting methods
- Recommended rate of fertilizers
- Irrigation and water-saving technologies/ practices
- Pest and weed management
- Harvesting techniques
- Early-warning communication system



370 thousand is directly attributed to only the investment made by AFESD. Under the conservative and modest scenarios which assumed that the adoption level in the 4th year of Phase II was the same as that in the 3rd year (during which the survey data was collected), and the adoption levels in the 1st and 2nd years were respectively 0 and 50% and ignoring the total production that is more likely to have continued to be reaped even after the completion of the project, our analysis showed that AFESD through its investment on the EFSAC project was able to **increase total domestic production of wheat in these five countries by about 79 - 474 thousand tons which was valued at about US\$ 19.7-118 million.**

Under these scenarios, assuming a linear relationship between investment and impact (acceptable for such analysis), the **benefit:cost ratio (BCR) was about 12-73 for the investment made in these five countries by AFESD during the 2nd phase of the EFSAC project.** Even in the absence of the benefits reaped by the remaining 4 countries served by the EFSAC project and the benefits accrued after the end of Phase II, the BCR from the total contribution of \$US2.01 million made by AFESD to the EFSAC project was between 7.57 and 45.41 - showing that **the investment made by AFESD had**

Figure 2. Enhancing Food Security in the Arab Countries (EFSAC) – BCR OF AFESD investment under three scenarios.

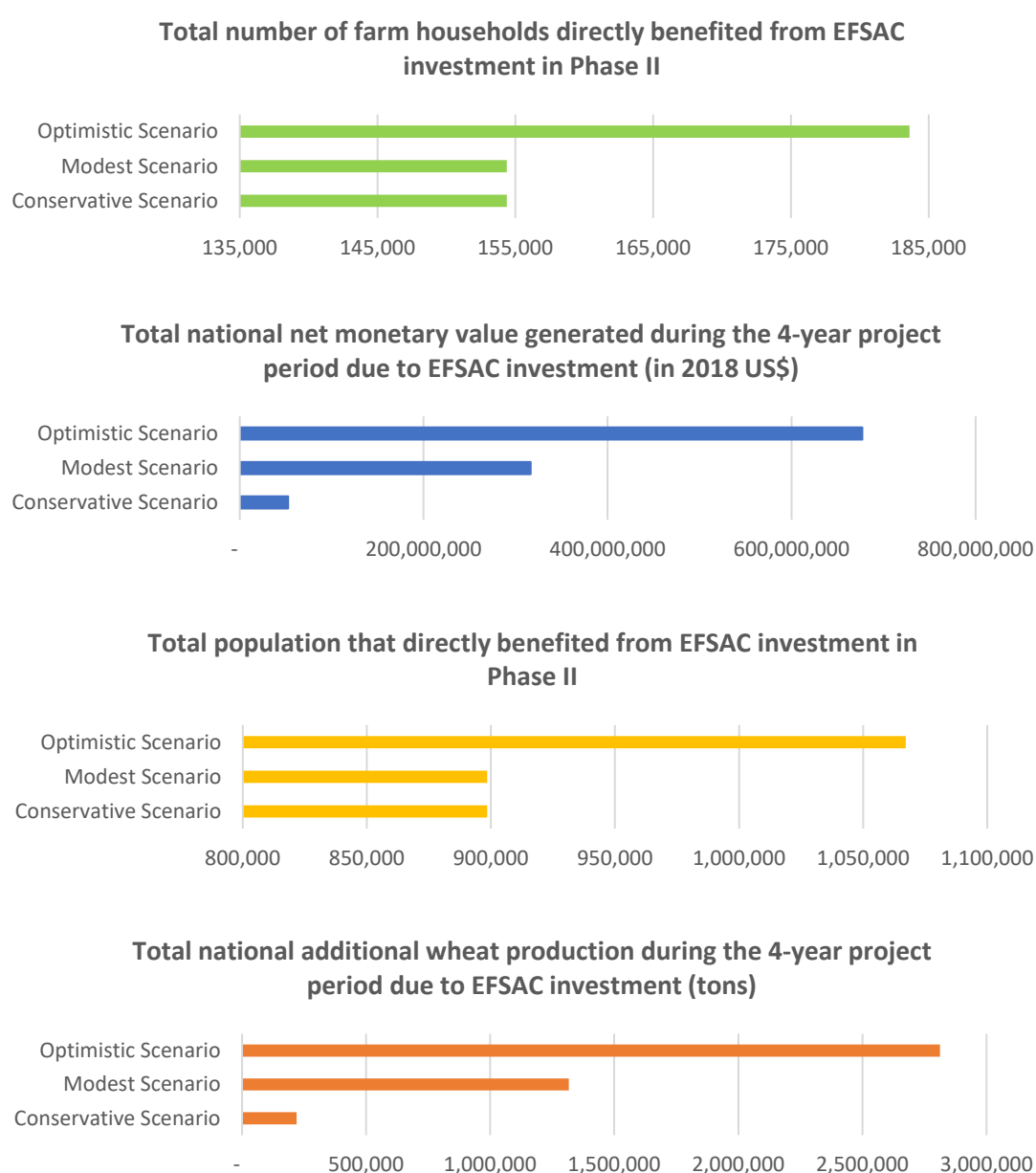


high returns. If the additional production that farmers are likely to have continued to reap even after the project will have phased out were considered (i.e., the optimistic scenario), the BCR would jump to over 157.

Technologies Adopted

In each country, the project provided farmers with a full package of high-performing bread or durum wheat varieties and up to ten other technology components. Farmers were free to decide to use the improved varieties with any other technology components provided by the project. Each technology component has its own benefits and applying all components of the package has a synergistic effect in increasing the benefits in terms of yield, natural resource conservation and environmental footprints.

Figure 3. Enhancing Food Security in the Arab Countries (EFSAC) – Key outcomes from AFESD’s investment.



Notes and Assumptions for three Scenarios – Conservative, Modest, Optimistic Estimates

Notes:

- The adoption levels in some of the countries are very high because the 1st phase of EFSAC and other governmental and non-governmental organizations have been promoting some or all of the same technologies. For example, in Egypt the project had very high spillover effect due to the success of the EFSAC project in Al-Sharkia, a national campaign has been launched to promote the same technology packages as those promoted by the EFSAC project. Therefore, in consultation with the national project coordinators, very modest levels of these adoption levels are attributed to the 2nd phase of EFSAC project.
- Adoption of these technologies is expected to increase and hence they are expected to have enhanced impacts even after the 2017/18 season.

Assumptions:

- For apportioning benefits between the EFSAC project and AFSED part of the investment, total benefits are assumed to be linearly proportional to the level of investment
- The investment is assumed to be made at the beginning of the project (regardless of the fund disbursements)
- Out of the total adoption level that was measured using the survey carried at the end of the 3rd year of the project, the modest levels of the adoption that are attributed to the 2nd phase of the EFSAC project are distributed into the first, second, third and 4th years of the project lifetime in the following proportion: 0%, 25%, 100% and 100% respectively.
- Average world market price of wheat of US\$250/ton is assumed for all countries
- The average cost of production for adopters and non-adopters of the technology is assumed to be comparable (some components of the package reduce cost while others increase and the net effect is often negative, i.e., reduction in cost, but in this analysis it is assumed to be zero thereby underestimating the BCR).

Conservative Scenario:

Only the benefits reaped during the 4-years of Phase II of the project are considered. This along with the other conservative assumptions made show that the estimates provided here can be considered the minimum benefit from the investment by AFSED.

Modest Scenario:

There will not be further expansion of the technologies and the farmers who adopted them will use the technologies for only 5 years after the 2017/18 season.

Optimistic Scenario:

There will be further expansion of the technologies by at least 20% and the farmers who adopted them will use the technologies for 10 years after the 2017/18 season.



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Parameters/Variables	Country					
	Egypt	Jordan	Morocco	Sudan	Tunisia	Total
Names of provinces/ governorates where the EFSAC project worked in Phase II	1-Al Dakkahliya	1- Irbid	1- Tadla 2- Sidi Bennour 3- Settlat 4- Benslimane	1-Northern State 2- Gezira Scheme	1-Jendouba 2- Kairouan	
Total wheat area in the project provinces/governorates ('000 ha)	112.62	4.28	873.42	113.60	203.95	1,307.87
Total number of wheat farmers in the project provinces/governorates	307,843.00	1,742.00	184,047.00	71,423.00	18,388.00	583,443.00
Average family size in the project provinces/ governorates	5.32	5.90	6.80	7.48	4.82	6.04
Total population in the project provinces/governorates	1,637,724.76	10,277.80	1,251,519.60	534,244.04	88,630.16	3,522,396.36
Adoption level for the recommended improved wheat varieties (% of total wheat area in the project provinces)	91.72	65.39	23.46	81.62	53.36	39.19
Adoption level for the recommended planting date (% of total wheat area in the project provinces)	42.48	78.22	18.34	88.78	78.16	36.06

Table 1. Continued

Parameters/Variables	Country					
	Egypt	Jordan	Morocco	Sudan	Tunisia	Total
Adoption level for the recommended number of tillage (% of total wheat area in the project provinces)	87.58	NA	NA	NA	96.03	22.52
Adoption level for zero tillage (% of total wheat area in the project provinces)	5.01	NA	0.70	NA	0.00	0.90
Adoption level for the recommended planting method (% of total wheat area in the project provinces)	73.42%	82.23	NA	NA	60.13	15.97
Adoption level for raised beds (% of total wheat area in the project provinces)	18.74	NA	NA	NA	NA	1.61
Adoption level for rotation with leguminous crops (% of total wheat area in the project provinces)	34.42	92.55	6.43	NA	31.31	12.44
Adoption level for the recommended phosphorus fertilizer rates (% of total wheat area in the project provinces)	NA	64.40	15.64	70.13	94.97	31.56

Table 1. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Adoption level for the recommended Nitrogen fertilizer rates (% of total wheat area in the project provinces)	19.83	62.46	23.87	82.70	51.64
					33.09
Adoption level for the recommended number of irrigations (% of total wheat area in the project provinces)	96.51	NA	5.20	86.08	81.91
					32.03
Adoption level for the recommended seeding rate (% of total wheat area in the project provinces)	84.75	60.17	9.14	32.29	55.76
					25.10
Adoption level for the recommended weed control method (% of total wheat area in the project provinces)	75.82	55.01	20.94	90.67	72.28
					39.84
Adoption level for the recommended harvest date (% of total wheat area in the project provinces)	85.62	92.55	NA	NA	42.78
					14.35
Adoption level of recommended wheat varieties and at least 2 other practices (% of total wheat area in the project provinces)	90.92	48.79	6.83	80.48	24.35
					23.34

Table 1. Continued

Parameters/Variables	Country					
	Egypt	Jordan	Morocco	Sudan	Tunisia	Total
Yield that current adopters of recommended varieties and at least 2 other practices are obtaining (kg/ha)	6,899.66	2,049.76	2,636.22	2,755.85	3,163.28	3,094.01
Yield that current adopters of recommended varieties and at least 2 other practices would have obtained if they had adopted at maximum 1 of the recommended agronomic practices and no new varieties = Control (kg/ha)	6,689.86	1,353.21	2,237.77	1,693.00	2,795.68	2,657.93
Yield gain due to adoption of recommended wheat varieties and at least 2 other practices (kg/ha)	209.80	696.55	398.45	1,062.85	367.60	436.08
Net margins that current adopters of recommended varieties and at least 2 other practices are obtaining (US\$/ha)	2,069.90	614.93	790.87	826.76	948.98	928.20

Table 1. Continued

Parameters/Variables	Country					
	Egypt	Jordan	Morocco	Sudan	Tunisia	Total
Net margins that current adopters of recommended varieties and at least 2 other practices would have obtained if they adopted utmost 1 of the technologies without the new varieties (US\$/ha)	2,006.96	405.96	671.33	507.90	838.70	797.38
Additional net margins due to adoption of recommended wheat varieties and at least 2 other practices (US\$/ha)	62.94	208.97	119.54	318.86	110.28	130.82

Table 2. Aggregation of benefits and estimation of benefit:cost ratios – Conservative Scenario.

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 4th year of project (tons)	21,482.15	1,454.38	23,769.45	97,172.73	18,254.19
					162,132.90
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 4th year of project (US\$)	5,370,536.36	363,595.91	5,942,362.86	24,293,181.86	4,563,546.86
					40,533,223.85
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 3rd year of project (tons)	21,482.15	1,454.38	23,769.45	97,172.73	18,254.19
					162,132.90

Table 2. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total - 5 Countries					
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 3rd of project (US\$)	5,370,536.36	363,595.91	5,942,362.86	24,293,181.86	4,563,546.86
					40,533,223.85
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 2nd year of project (tons)	10,741.07	727.19	11,884.73	48,586.36	9,127.09
					81,066.45
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 2nd year of project (US\$)	1,342,634.09	90,898.98	1,485,590.71	6,073,295.47	1,140,886.71
					10,133,305.96
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 1st year of project (tons)	0.00	0.00	0.00	0.00	0.00
					0.00

Table 2. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 1st year of project (US\$)					
	0.00	0.00	0.00	0.00	0.00
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 4-years of the project life (tons)					
	53,705.36	3,635.96	59,423.63	242,931.82	45,635.47
					405,332.24
National discount rate in 2016/17 (%)					
	19.25%	5.00%	2.50%	13.00%	4.86%
					5.23%
National discount rate in 2015/16 (%)					
	15.25%	3.75%	2.50%	12.50%	4.25%
					4.74%
National discount rate in 2014/15 (%)					
	9.75%	3.75%	2.50%	11.00%	4.71%
					4.21%

Table 2. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
					Total - 5 Countries
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 4-years of the project life (in 2018 US\$)	13,558,263.09	843,215.83	13,594,083.53	59,430,991.95	10,588,804.90
					98,015,359.31
Minimum share of the current adoption levels that can be safely attributed to the EFSAC project (%)	40%	90%	85%	50%	73%
Total national additional wheat production during the 4-year project period due to EFSAC investment (tons)	21,482.15	3,272.36	50,510.08	121,465.91	22,817.73
					219,548.24
Total national net monetary value generated during the 4-year project period due to EFSAC investment (in 2018 US\$)	5,423,305.24	758,894.25	11,554,971.00	29,715,495.97	5,294,402.45
					52,747,068.91
Total duration of the project (in years)	4.00	4.00	4.00	4.00	4.00
Total budget for the EFSAC project (in US\$)	696,833.00	651,833.00	656,833.00	674,333.00	659,333.00
					3,339,165.00

Table 2. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
					Total - 5 Countries
Total investment by AFESD (in US\$)	235,278.00	227,778.00	230,278.00	250,278.00	227,778.00
Total budget for the EFSAC project (in 2018 US\$)	1,010,989.92	755,246.58	725,020.73	1,023,684.97	792,606.17
Total investment by AFESD (in 2018 US\$)	341,349.63	263,915.07	254,183.82	379,939.63	273,819.53
Share of AFESD in total project budget (%)	34%	35%	35%	37%	35%
Benefit:cost ratio (BCR) for EFSAC project	5.36	1.00	15.94	29.03	6.68
Benefit:cost ratio (BCR) for AFESD investment	5.36	1.00	15.94	29.03	6.68
Total number of farming households that directly benefited from AFESD investment in Phase II	37,800	267	3,745	10,667	773
Total population that directly benefited from AFESD investment in Phase II	201,100	1,577	25,472	79,789	3,727
Total additional wheat production due to AFESD investment in Phase II in 4 years of project lifetime (tons)	7,253.21	1,143.50	17,708.25	45,081.95	7,882.78
					79,069.69

Table 2. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total monetary value generated due to AFESD investment in Phase II in 4 years of project lifetime (in 2018 US\$)					
	1,631,972.29	257,287.95	3,984,355.64	10,143,438.17	1,773,625.81
					17,790,679.86
Total value added by the AFESD investment in Phase II in 4 years of project lifetime (in 2018 US\$)					
	1,290,622.66	(6,627.13)	3,730,171.82	9,763,498.54	1,499,806.28
					16,277,472.18

Table 3. Aggregation of benefits and estimation of benefit:cost ratios – Modest Scenario.

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 4th year of project (tons)					
	128,892.87	8,726.30	142,616.71	583,036.36	109,525.12
					972,797.37
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 4th year of project (US\$)					
	32,223,218.16	2,181,575.43	35,654,177.15	145,759,091.19	27,381,281.14
					243,199,343.07
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 3rd year of project (tons)					
	128,892.87	8,726.30	142,616.71	583,036.36	109,525.12
					972,797.37
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 3rd year of project (US\$)					
	32,223,218.16	2,181,575.43	35,654,177.15	145,759,091.19	27,381,281.14
					243,199,343.07

Table 3. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total - 5 Countries					
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 2nd year of project (tons)	64,446.44	4,363.15	71,308.35	291,518.18	54,762.56
					486,398.69
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 2nd year of project (US\$)	8,055,804.54	545,393.86	8,913,544.29	36,439,772.80	6,845,320.29
					60,799,835.77
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 1st year of project (tons)	0.00	0.00	0.00	0.00	0.00
					0.00
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 1st year of project (US\$)	0.00	0.00	0.00	0.00	0.00
					0.00

Table 3. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total - 5 Countries					
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 4-years of the project life (tons)	322,232.18	21,815.75	356,541.77	1,457,590.91	273,812.81
					2,431,993.43
National discount rate in 2016/17 (%)	19.25%	5.00%	2.50%	13.00%	4.86%
					5.23%
National discount rate in 2015/16 (%)	15.25%	3.75%	2.50%	12.50%	4.25%
					4.74%
National discount rate in 2014/15 (%)	9.75%	3.75%	2.50%	11.00%	4.71%
					4.21%
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 4-years of the project life (in 2018 US\$)	81,349,578.54	5,059,294.99	81,564,501.20	356,585,951.68	63,532,829.42
					588,092,155.83
Minimum share of the current adoption levels that can be safely attributed to the EFSAC project (%)	40%	90%	85%	50%	50%
					73%

Table 3. Continued

Parameters/Variables	Country					Total - 5 Countries
	Egypt	Jordan	Morocco	Sudan	Tunisia	
Total national additional wheat production during the 4-year project period due to EFSAC investment (tons)	128,892.87	19,634.18	303,060.51	728,795.46	136,906.41	1,317,289.42
Total national net monetary value generated during the 4-year project period due to EFSAC investment (in 2018 US\$)	32,539,831.42	4,553,365.49	69,329,826.02	178,292,975.84	31,766,414.71	316,482,413.48
Total duration of the project (in years)	4.00	4.00	4.00	4.00	4.00	4.00
Total budget for the EFSAC project (in US\$)	696,833.00	651,833.00	656,833.00	674,333.00	659,333.00	3,339,165.00
Total investment by AFESD (in US\$)	235,278.00	227,778.00	230,278.00	250,278.00	227,778.00	1,171,390.00
Total budget for the EFSAC project (in 2018 US\$)	1,010,989.92	755,246.58	725,020.73	1,023,684.97	792,606.17	4,307,548.38
Total investment by AFESD (in 2018 US\$)	341,349.63	263,915.07	254,183.82	379,939.63	273,819.53	1,513,207.68
Share of AFESD in total project budget (%)	34%	35%	35%	37%	35%	35%
Benefit:cost ratio (BCR) for EFSAC project	32.19	6.03	95.62	174.17	40.08	73.47

Table 3. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total - 5 Countries					
Benefit:cost ratio (BCR) for AFESD investment	32.19	6.03	95.62	174.17	40.08
Total number of farming households that directly benefited from AFESD investment in Phase II	37,800	267	3,745	10,667	773
Total population that directly benefited from AFESD investment in Phase II	201,100	1,577	25,472	79,789	3,727
Total additional wheat production due to AFESD investment in Phase II in 4 years of project lifetime (tons)	43,519.26	6,861.01	106,249.48	270,491.68	47,296.69
Total monetary value generated due to AFESD investment in Phase II in 4 years of project lifetime (in 2018 US\$)	9,791,833.75	1,543,727.69	23,906,133.84	60,860,629.03	10,641,754.83
Total value added by the AFESD investment in Phase II in 4 years of project lifetime (in 2018 US\$)	9,450,484.12	1,279,812.61	23,651,950.02	60,480,689.40	10,367,935.31

Table 4. Aggregation of benefits and estimation of benefit:cost ratios – Optimistic Scenario.

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 4th year of project (tons)	236,303.60	15,998.22	261,463.97	1,068,900.00	200,796.06
					1,783,461.85
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 4th year of project (US\$)	59,075,899.96	3,999,554.96	65,365,991.44	267,225,000.51	50,199,015.43
					445,865,462.30
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 3rd year of project (tons)	236,303.60	15,998.22	261,463.97	1,068,900.00	200,796.06
					1,783,461.85

Table 4. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 3rd of project (US\$)	59,075,899.96	3,999,554.96	65,365,991.44	267,225,000.51	50,199,015.43
					445,865,462.30
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 2nd year of project (tons)	118,151.80	7,999.11	130,731.98	534,450.00	100,398.03
					891,730.92
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 2nd year of project (US\$)	14,768,974.99	999,888.74	16,341,497.86	66,806,250.13	12,549,753.86
					111,466,365.58

Table 4. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 1st year of project (tons)					
	0.00	0.00	0.00	0.00	0.00
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 1st year of project (US\$)					
	0.00	0.00	0.00	0.00	0.00
Total national additional wheat production due to the current adoption level of recommended wheat varieties and at least 2 other practices during the 4-years of the project life (tons)					
	590,759.00	39,995.55	653,659.91	2,672,250.01	501,990.15
					4,458,654.62

Table 4. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
					Total - 5 Countries
National discount rate in 2016/17 (%)	19.25%	5.00%	2.50%	13.00%	4.86%
National discount rate in 2015/16 (%)	15.25%	3.75%	2.50%	12.50%	4.25%
National discount rate in 2014/15 (%)	9.75%	3.75%	2.50%	11.00%	4.71%
Total national net monetary value generated due to the current level of adoption of recommended wheat varieties and at least 2 other practices during the 4-years of the project life (in 2018 US\$)	149,140,894.00	9,275,374.15	149,534,918.86	653,740,911.41	116,476,853.94
Minimum share of the current adoption levels that can be safely attributed to the EFSAC project (%)	48%	90%	90%	60%	60%
					79%

Table 4. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total national additional wheat production during the 4-year project period due to EFSAC investment (tons)	283,564.32	35,995.99	588,293.92	1,603,350.00	301,194.09
Total national net monetary value generated during the 4-year project period due to EFSAC investment (in 2018 US\$)	71,587,629.12	8,347,836.73	134,581,426.98	392,244,546.84	69,886,112.36
Total duration of the project (in years)	4.00	4.00	4.00	4.00	4.00
Total budget for the EFSAC project (in US\$)	696,833.00	651,833.00	656,833.00	674,333.00	659,333.00
Total investment by AFESD (in US\$)	235,278.00	227,778.00	230,278.00	250,278.00	227,778.00
Total budget for the EFSAC project (in 2018 US\$)	1,010,989.92	755,246.58	725,020.73	1,023,684.97	792,606.17
Total investment by AFESD (in 2018 US\$)	341,349.63	263,915.07	254,183.82	379,939.63	273,819.53

Table 4. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total - 5 Countries					
Share of AFESD in total project budget (%)	34%	35%	35%	37%	35%
Benefit:cost ratio (BCR) for EFSAC project	70.81	11.05	185.62	383.17	88.17
Benefit:cost ratio (BCR) for AFESD investment	70.81	11.05	185.62	383.17	88.17
Total number of farming households that directly benefited from AFESD investment in Phase II	45,360	267	3,966	12,800	928
Total population that directly benefited from AFESD investment in Phase II	241,320	1,577	26,971	95,747	4,473
Total additional wheat production due to AFESD investment in Phase II in 4 years of project lifetime (tons)	95,742.37	12,578.52	206,249.00	595,081.71	104,052.71
					1,013,704.31

Table 4. Continued

Parameters/Variables	Country				
	Egypt	Jordan	Morocco	Sudan	Tunisia
Total monetary value generated due to AFESD investment in Phase II in 4 years of project lifetime (in 2018 US\$)					
	21,542,034.26	2,830,167.43	46,406,024.51	133,893,383.86	23,411,860.63
					228,083,470.68
Total value added by the AFESD investment in Phase II in 4 years of project lifetime (in 2018 US\$)					
	21,200,684.63	2,566,252.35	46,151,840.69	133,513,444.23	23,138,041.10
					226,570,263.00

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