

Annex 23: Estimation of Benefits and Beneficiaries

Table 1 Beneficiaries mapping and project adaptation benefits

Table 2 Output-Wise Estimation of SVRALI Beneficiaries

Table 3 Project Area and National Level Population

Table 4 Summary Table of Beneficiaries

Table 5 Estimation of Area Under Climate Resilient Management Practices

Table 6: Estimation of Value of Physical Assets Made More Climate Resilient

Table 7: Outreach of Information communication technologies

Table 8: Output-Wise Estimation of SVRALI Beneficiaries at Mid Term

Table 6 Beneficiaries mapping and project adaptation benefits

Private Sector	Rationale	Involvement / Benefits
(I) Farmers	<p>Outdated irrigation infrastructures, energy shortage, inappropriate cultivation practices, lack of climate resilient crops and limited skills are the main bottlenecks for climate adaptive agricultural practices of farmers. In a business as usual scenario, the farming communities of the Southern Governorates will soon not be able to secure their livelihood from agriculture. Given that agriculture in target areas employs about 25% of the total population and that the region produces about 55% of the rice and 10% of the other cereals, the implications of such scenario may jeopardize the food security and stability of the country.</p> <p>The project will have special focus on women farmer. Despite their essential contribution to the agricultural sector, their access to productive resources and employment opportunities remain limited, reducing therefore the capacity to improve own lives and to contribute to economic growth and food security of their communities. Although women carry large parts of the work burden in the sector, their voices and concern are often dismissed, and male farmers are assigned the lead role in decision making</p>	<p>The project will work with farmers to enhance the climate resilience of rural livelihoods through the introduction of climate adaptive technologies and farming practices to increase water use efficiency and availability at the farm level and enhance water productivity¹. In particular the Farmers and their HH will be direct beneficiaries of the following outputs:</p> <p>Output 1.1.1: 68 kms of canals shifted from open to closed systems Output 1.1.2: One km of Water canals covered with solar panels Output 2.1.2: Enhanced capacity of 10,000 farmers in Climate Resilient Agriculture Output 2.1.3: 100,000 farmers reached through ICT4D technologies</p> <p>Part of the project is specifically designed to enhance the role of women in the agricultural sector through the creation of the network of climate Wise Women that will help to increase adaptive capacity of women farmers in the face of climate risks and empower them through enhancing their leadership skills and ability to adapt to climate change. Shifting the paradigm from women as victims, to women as powerful agents of change, has shown to be transformative. The current project is expected to have a significant impact in changing perceptions and stereotypes regarding women and their role in communities. Specific outputs are the following:</p> <p>Output 2.3.1: A cadre of 150 Climate Wise Women (CWW) trained as change agents for climate adaptation. Output 2.3.2: 40,500 women adopt climate adaptive measures.</p>
(II) Water Users Associations (WUA)	<p>The authority of traditional farmer organizations has weakened due to the unrest of the last two decades, and the various land reforms that fragmented ownership including tenure reform associated with irrigation development. Efforts deployed through previous projects assisted however the WUA establishment in Iraq. Among others initiatives were successful in promoting the Water Users Association Law that was established in 2014, and in the creation of WUA throughout the country has occurred as a consequence. Their capacities were reinforced and a sustainable water management model through WUAs in Iraq was created. It is however still necessary to build better coordination and promote knowledge sharing among Ministry of Water Resources (MoWR) and Ministry of Agriculture (MoA), to reinforce the important role that WUAs should play in improving the efficiency with which water is used in agricultural production.</p>	<p>The project will work closely with the WUA section within both ministries (MoWR and MoA) to mobilize actions and complete the procurement and logistical preparations for establishing and/or reinforcing the capacities of WUAs in the selected project areas. Furthermore trainings will be conducted in good practices/technical and irrigation scheduling with targets and outreach measures to ensure participation of female farmers. In addition, Water User Associations will be involved in the whole process of rehabilitation of water canals in output 1.1 for the operation and management of the improved systems. After the establishment of WUAs, it is the intention of government that these systems will be managed by these WUAs. Activities specifically focusing on the enhancement of WUAs are included in the following output:</p> <p>Output 1.3.2. Supporting 15 WUAs in developing and adopting more efficient and climate sensitive water-distribution plans</p>
(III) Extensionists	<p>Extensionists currently lack the knowledge and skill to tackle the adverse impacts of climate change and there are limited mechanisms in place for them to be introduced to CRA practices or to be informed about changing weather patterns. In addition extensionists do not have the possibility to carry out training of farmers on CRA practices.</p>	<p>The initiative will update the knowledge of the extension services raising awareness about existing research on improved technologies and train them on Climate Smart Agriculture (CSA). In addition the extensionists will be exposed to the Farmer Field Schools systems that will ensure a continuous and close contact with the Farmers. The following are the outputs specifically designed for extensionists.</p>

¹ Water invested per unit of production

		Output 2.1.1. 400 Extension Staff trained on climate resilient agricultural practices and technologies to train 10,000 farmers in adaptive practices and technologies.
(IV) Technicians	In Iraq there are no specialized vocational schools for irrigation and drainage, but there are departments of water resources technologies (irrigation and drainage techniques branch) at the level of technical institutes, that provide a two years curricula after high school to form field agents involved in day-to-day operation and maintenance of the irrigation scheme. There are also departments of water resources in colleges of engineering that form irrigation engineers. Moreover, there are agricultural vocational schools that form field agents intervening in agriculture production activities. Common and integrated knowledge about up-to date irrigation technology, including renewable energy, is however missing in all curricula.	<p>To ensure the sustainability of the actions promoted under this project the knowledge related to water savings technologies including solar energy applications will be integrated in the national technical curricula and technicians will be trained about their application in the frame of the activities of the following output:.</p> <p>Output 1.3.1 500 technical staff trained in design, installation and maintenance of irrigation, drainage and energy technologies.</p>
(V) Private Sector	Given the absence of security and stability and an uncertain policy environment, the private sector has not made any significant investments in agribusiness or in other major sectors in the country. Problems include security, unclear requirements for registering businesses, license requirements, limited communication infrastructure and logistics, difficult access to finance and a non-competitive business environment lacking transparent and clear legal frameworks for rules-based-market competition.	Through the project the uptake of climate-adaptive agricultural technology will be promoted creating new business activities and incentivizing private sector participation. Among others, the project will design a new climate resilient policy to promote efficient use of water in agriculture at the national level. In coordination with national organizations, the project will work with both input providers and financial institutions to support the availability of goods and resources for farm investments. Moreover, component 3 is expected to provide the necessary policy framework for private sector involvement and it is projected to play a major role in de-risking private investments in energy and agriculture.

Table 7 Output-Wise Estimation of SVRALI Beneficiaries

Components/outputs	Beneficiaries			Women			Assumptions and benefits	Results area
	Direct	Indirect	Total	Direct	Indirect	Total		
Output 1.1.1: 68 kms of canals shifted from open to closed systems								
Targeted Households	1,244	760	2,004				<p>Direct beneficiaries: The canals rehabilitated supply irrigation water for a total area of 4,044 ha (see table 5 of the FFP). Given that the average cultivated area under irrigation in the target areas is 3.25ha per HH, it is estimated that the rehabilitation will directly improve water supply efficiency to farm gate of around 118 farmers in Najaf, 408 farmers in Karbala and 300 farmers in Al Muthanna (1,244 HH in total). The HH are multiplied with the average number of people per HH (ranging from 6.3 in Najaf/Karbala to 7.6 in Muthanna) to obtain total number of direct beneficiaries. The main benefits of the direct beneficiaries are the following</p> <ul style="list-style-type: none"> • Equal distribution of water and reduction of conflicts. • Reduced groundwater pumping[-16,903,258 m3 per Y]. • Reduced electricity needs for groundwater pumping [-255 MWh per Y]. • Reduced evaporation [0% in the closed system]. • higher conveyance efficiency [93%]. <p>Indirect beneficiaries: Given the water savings obtained through the rehabilitation of 68 km of canals of output 1.1, it will be possible to provide water to an additional area of 2,471. Given that the average cultivated area under irrigation in the target areas is 3.25ha per HH, it is estimated that 760 HH, or 5,167 persons will indirectly benefit from the activities of output 1.1.</p>	ARA 3
Number of beneficiaries	8,457	5,167	13,624	4,203	2,568	6,771		
Output 1.2.1:One km of Water canals covered with solar panels								
Targeted Households	446		446				<p>Direct beneficiaries: The installation of solar systems on water canals will improve the energy and water security of canals supplying irrigation water to at least 1,450 ha of agricultural land (see table 6 of the FFP). Given that the average cultivated area under irrigation</p>	ARA 3
Number of beneficiaries	3,151		3,151	1,566		1,566		

	Beneficiaries			Women			Assumptions and benefits	Results area
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
							in the target areas is 3.25ha per HH, it is estimated that this output will improve resilience of at least 446 HH in the target areas. The HH are multiplied with the average number of people per HH (ranging from 6.3 in Najaf/Karbala to 7.6 in Muthanna) to obtain total number of direct beneficiaries. The main benefits of the beneficiaries are an enhanced water security through more reliable energy supply. This is especially important to compensate for the insufficient grid providing only between 18 - 11 hours of electricity per day throughout the country and to substitute expensive generator applications which require furthermore high maintenance.	
Output 1.3.1 500 technical staff trained in design, installation and maintenance of irrigation, drainage and energy technologies.								
Number of beneficiaries	530	600	1,130	106	120	226	<p>Direct Beneficiaries: The Capacity development activities will involve 500 technicians and 30 teachers. Number of Women is estimated based on the assumption that they comprise 20% of teachers and technicians.</p> <p>Indirect beneficiaries: Given that the curricula will be updated on a national level it is assumed that it will benefit in total 600 teachers on a national level. It is assumed that 20% of teachers are women.</p> <p>The beneficiaries will benefit from updated technical knowledge in a dynamic sector such as renewable energy and irrigation technology, which will diversify their potential income opportunities and will open many career and growth opportunities, especially for the younger generation.</p>	ARA 1
Output 2.1.1. 400 Extension Staff trained on climate resilient agricultural practices and technologies to train 10,000 farmers in adaptive practices and technologies.								
Number of beneficiaries	412	n.a.	412	63	n.a.	63	The output will train 12 Master Trainers and 400 extensionists that can operate all over the Southern Governorates. The Number of women assumes that 15 percent of the extension staff are women.	ARA 1

	Beneficiaries			Women			Assumptions and benefits	Results area
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
							The beneficiaries will obtain updated knowledge and expert knowledge in Climate resilient agriculture, a dynamic sector that will increase in importance in the future. The gained knowledge will diversify the potential income opportunities of the beneficiaries and open many career and growth opportunities, especially for the younger generation.	
Output 2.1.2 Enhanced capacity of farmers in Climate Resilient Agriculture								
Number of Farming HHs	10,000	30,000	40,000	3,000			Direct Beneficiaries: 10,000 farmers will be trained on CRA methodologies directly impacting the resilience of their HH. The total number of beneficiaries is calculated based on the average number of members per household of 6.8. Women beneficiaries are calculated based on the assumption that at least 30 percent of women will be part of FFS and that the share of women of the total population represents 49.7 percent. Indirect Beneficiaries: Calculations are carried out, based on the assumption that each beneficiary will capacitate three additional farmers with at least one of the topics learned and that 6.8 is the average number of members per household in the target area and that the share of women of the total population represents 49.7 percent. The beneficiaries will be able to increase their irrigation efficiency, on average from 60% to 75%, and reduce hence connected costs. Furthermore they will increase crop yields (e.g. wheat on average by 10%) and improve long term fertility of their land.	ARA 2
Number of beneficiaries	67,982	201,000	268,982	33,786	99,894	133,680		
Output 2.1.3 Farmers reached through ICT4D technologies								
Number of Farming HHs	100,000		100,000				The output is aiming to reach 100,000 farmers. Total beneficiaries are the members of the farming HH (calculated with an average of 6.8 members per HH). Beneficiaries will receive updated knowledge about CRA practices to be able to increase their resilience and to be able to apply approaches increasing crop yield, irrigation efficiency and improve long term fertility of their land.	ARA 2
Number of beneficiaries	679,823		679,823	337,862		337,862		
Output 2.2.1: Technical capacities of 90 stakeholders and knowledge of 12,000 citizens on solar energy								

	Beneficiaries			Women			Assumptions and benefits	Results area
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
increased through trainings and awareness raising events								
Number of beneficiaries	12,090			5,982			90 stakeholders (30% women) are expected to be trained on solar energy applications in the agricultural field. At the same time the awareness of 12,000 citizens will be raised on the same topic in the frame of events. The beneficiaries will gain knowledge to apply solar energy technologies to increase resilience in agricultural practices and reduce energy costs. In fact given the low availability of energy from the grid (11-18 hours throughout the country), households often have to apply generators with very high costs to bridge the gap. With significantly and constantly decreasing costs for PV technology, solar applications can reduce running costs of HH and also contribute to mitigation air pollution and connected health problems caused by diesel generators. The stakeholders trained on solar energy can with the gained knowledge diversify potential income opportunities and open many career and growth opportunities.	ARA 1
Output 2.3.1: A cadre of 150 Climate Wise Women (CWW) trained as change agents for climate adaptation.								
Number of Farming HHs	150			150			150 women will be capacitated on the CRA topics. The total number of beneficiaries is calculated based on the average number of members per household of 6.8. It can be safely assumed that the gained knowledge and the role that CWW carry out will contribute to increasing their self-esteem and self-worth. The gained knowledge can furthermore diversify potential income opportunities and open many career and growth opportunities.	ARA 1
Number of beneficiaries	1,005			650				
Output 2.3.2: 40,500 women adopt climate adaptive measures.								
Number of Farming HHs	40,500		40,500	40,500		40,500	It is assumed that each CWW will extend her outreach to 270 women over the life of the project reaching in total 40,500 women with CRA topics. 40,500 women will be capacitated by CWW (output 2.5) on CRA. Total beneficiaries are the members of the	ARA 2
Number of beneficiaries	271,350		271,350	133,776		133,776		

	Beneficiaries			Women			Assumptions and benefits	Results area
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
							farming HH (calculated with an average of 6.8 members per HH). It can be safely assumed that the gained knowledge will contribute to increasing the self-esteem, self-worth and the standing within the HH and society of beneficiary women. The gained knowledge can furthermore diversify potential income opportunities and open career and growth opportunities.	
Output 3.1.1: A climate resilient water allocation strategy								
Targeted Households		54,277	54,277				Indirect beneficiaries: It is expected that the allocation strategy will improve the water supply of approximately one third of the rural population of the target area that corresponds in total to 1,079,082.	ARA 1
Number of beneficiaries		356,097	356,097		177,155	177,155	Sustainable allocation and use of water will lead to the introduction of a service-oriented culture that will bring about long-term sustainability to the country and the beneficiaries.	
Output 3.2.1: Enhanced planning for solar rural electrification								
Targeted Households		51,553	51,553				Indirect beneficiaries: It is expected that 10% of the population in the target governorates benefit from enhanced rural planning related to solar energy In this regard, the roadmap can also increase resilience to climate change of the local population by promoting solar energy that has the potential to contribute to the following:- powering irrigation systems with solar PV, increasing water security - enable cold storage facilities to preserve agricultural products and reduce food loss and waste (FLW) -powering agricultural processing equipment to add value locally and reduce FLW - reduce costs for operation and maintenance of energy generating equipment and hence free HH costs for other necessary investment costs to increase resilience. - powering irrigation systems with solar PV, increasing water security - enable cold storage facilities to preserve agricultural products and reduce food loss and waste (FLW) -powering agricultural processing equipment to add value locally and reduce FLW - reduce costs for operation and maintenance of energy generating equipment and hence free HH costs for other necessary investment costs to increase resilience.	ARA 1
Number of beneficiaries		350,470	350,470		174,178	174,178		

	Beneficiaries			Women			Assumptions and benefits	Results area
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
Total Number of targeted Households	152,340	136,590	288,930	43,650		43,650		
Total Number of beneficiaries	1,044,800	913,334	1,958,134	517,994	453,915	971,909		
	Beneficiaries			Women				
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
ARA 1	14,037	707,167	721,204	6,801	351,453	358,254		
ARA 2	1,019,155	201,000	1,220,155	505,424	99,894	605,318		
ARA 3	11,608	5,167	16,775	5,769	2,568	8,337		
Total	1,044,800	913,334	1,958,134	517,994	453,915	971,909		

Table 8 Project Area and National Level Population

	Total Population	Share of Female (%)	Avg. HH Size	Rural	HH	Female
Karbala	1,250,806	49.6	6.3	375,242	59,562	186,120
Muthanna	835,797	49.7	7.6	250,739	32,992	124,617
Najaf	1,510,338	49.9	6.3	453,101	71,921	226,097
National	39,127,889	49.5	6	11,738,367	1,956,395	5,810,492
Total 3 Governorates	3,596,941	49.7333		1,079,082	164,475	536,834

Source: Central Statistical Organization (CSO), Ministry of Planning, Government of Iraq, 2019 / Data on Average HH Size is taken from Comprehensive Food Security and Vulnerability Analysis (CFSVA) 2016, World Food Programme and CSO, Government of Iraq / Data on number of villages taken from Governorate Rural Development Surveys (2017)

Table 9 Summary Table of Beneficiaries

	Direct	Indirect	Total
Total Households	152,340	136,590	288,930
Total Beneficiaries	1,044,800	913,334	1,958,134
Women	517,994	453,915	971,909
Mid-Term			
Total Households	45,748	41,018	86,766
Total Beneficiaries	313,754	274,274	588,028
Women	155,554	136,311	291,865

Table 10 Estimation of Area Under Climate Resilient Management Practices

Assumptions	Component	Area (ha)
a:	Output 1.1.1: 68 kms of canals shifted from open to closed systems	6,515
b:	Output 1.2.1: One km of Water canals covered with solar panels	1,450
c	Farmer Field School Participants (Direct)	18,000
d	Farmer Field School Participants (Indirect)	30,000
e	Climate Wise Women	48,600
		104,565

- a: Based on the assumptions made of area covered by the open canals to covered canals given in Governorate sheets Annex 2
- b: Based on the assumption of the area benefitting from solar pumps calculated and given in Beneficiary Table in Annex 2
- c: 60% of the 10,000 Farmer Field School participant adopts the new climate resilient practices on 3 hectares of land on average
- d: Each of the 30,000 farmers who have learnt of a CRA indirectly implement the practice or technology on 1 hectare of land
- e: It is estimated that 60% of the 40,500 women who have been reached by the CWW will adopt the CRA on 2 hectares of land on average

Table 6: Estimation of Value of Physical Assets Made More Climate Resilient

Assumptions	Type	Units	Original Value (USD)	Current Investment (USD)	Total Value USD)
a:	Open canals converted to piped Systems	13	1,611,000	22,699,870	24,310,870
b:	Value of land under climate resilient practices (Ha)	121,965			609,825,000
				USD	634,135,870

a: The cost of scheme has been calculated based on a cost of USD 18,750 per km of the distributory and the inclusion of 3 pumps (15000), 7 gates (USD) 21000, head-regulators (300,000) 1611000

b: The cost of land brought under resilient practices is estimated at USD 5,000 per hectare at a minimum.

Table 7: Outreach of Information communication technologies

Type of ICT4CC technologies	Number of Farming HHs	Number of beneficiaries
Virtual learning communities through social networks	60,000	407,894
Technological mobile applications (App)	10,000	67,982
Telephone contact networks (e.g., WhatsApp)	15,000	101,973
Mobile telephone messaging networks	15,000	101,973
	100,000	679,823

Table 8 Output-Wise Estimation of SVRALI Beneficiaries at Mid Term

Commented [DU1]: New table

Components/outputs	Beneficiaries			Women			Assumptions for Mid Term estimation (for benefits and further information on beneficiaries, refer to Table 2.	Results areas
	Direct	Indirect	Total	Direct	Indirect	Total		
Output 1.1.1: 68 kms of canals shifted from open to closed systems								
Targeted Households	732	447	1,179				At Midterm, 40 km (59%) of the 68 km of canals are expected to be rehabilitated. The number of beneficiaries at mid term is estimated accordingly.	ARA 3
Number of beneficiaries	4,975	3,039	8,014	2,472	1,511	3,983		
Output 1.1.2: One km of Water canals covered with solar panels								
Targeted Households	446		446				At Midterm it is expected that all solar systems will have been installed, therefore all beneficiaries are included.	ARA 3
Number of beneficiaries	3,151		3,151	1,566		1,566		
Output 1.3.1 500 technical staff trained in design, installation and maintenance of irrigation, drainage and energy technologies.								
Number of beneficiaries	0	0	0	0	0	0	It is the aim for the technicians to be trained by the end of the project. Therefore at midterm no beneficiaries are accounted.	ARA1
Output 2.1.1. 400 Extension Staff trained on climate resilient agricultural practices and technologies to train 10,000 farmers in adaptive practices and technologies.								
Number of beneficiaries	412	n.a.	412	63	n.a.	63	All beneficiaries should be trained already at Midterm.	ARA 1
Output 2.1.2 Enhanced capacity of farmers in Climate Resilient Agriculture								
Number of Farming HHs	10,000	30,000	40,000	3,000			All farmers should be already trained at Midterm	ARA 1
Number of beneficiaries	67,982	201,000	268,982	33,786	99,894	133,680		
Output 2.1.3 Farmers reached through ICT4D technologies								

	Beneficiaries			Women				
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total	Assumptions for Mid Term estimation (for benefits and further information on beneficiaries, refer to Table 2.	Results areas
Number of Farming HHs	40,000	0	40,000	0	0	0	It is expected that at Midterm 40,000 HH will have been reached	ARA 2
Number of beneficiaries	271,929	0	271,929	135,145	0	135,145		
Output 2.2.1: Technical capacities of 90 stakeholders and knowledge of 12,000 citizens on solar energy increased through trainings and awareness raising events								
Number of beneficiaries	6,040			3,000			40 stakeholders will be trained and awareness of 6,000 citizens raised on solar energy by Midterm	ARA 1
Output 2.3.1: A cadre of 150 Climate Wise Women (CWW) trained as change agents for climate adaptation.								
Number of Farming HHs	150			150			It is expected that all women will have been trained by Midterm	ARA 2
Number of beneficiaries	1,005			650				
Output 2.3.2: 40,500 women adopt climate adaptive measures.								
Number of Farming HHs	40,500		40,500	40,500		40,500	It is expected that all women will have been reached by the project at Midterm	ARA 2
Number of beneficiaries	271,350		271,350	133,776		133,776		
Component 3.1.1: A climate resilient water allocation strategy								
Targeted Households		0	0				The strategy will not have been implemented at Midterm, therefore no beneficiaries are account	ARA 1
Number of beneficiaries		0	0		0	0		
Output 3.2.1: Enhanced planning for solar rural electrification								
Targeted Households		51,553	51,553				The aim is to have the strategy in place by Midterm; therefore, all beneficiaries are accounted for at Midterm.	ARA 1
Number of beneficiaries		350,470	350,470		174,178	174,178		
Total Number of beneficiaries	558,862	353,509	908,326	273,672	175,689	448,711		

	Beneficiaries			Women				
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total	Assumptions for Mid Term estimation (for benefits and further information on beneficiaries, refer to Table 2.	Results areas
	Beneficiaries			Women				
Components/outputs	Direct	Indirect	Total	Direct	Indirect	Total		
ARA 1	1,417	350,470	351,887	713	174,178	174,891		
ARA 2	543,279	0	543,279	268,921	0	268,921		
ARA 3	8,126	3,039	11,165	4,038	1,511	5,549		
Total	552,822	353,509	906,331	273,672	175,689	449,361		

