



ADAPTATION FUND

REGIONAL PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Increasing the resilience of both displaced persons and host communities to climate change-related water challenges

Countries: Jordan, Lebanon

Thematic Focal Area: Transboundary water management and food security

Type of Implementing Entity: Multilateral

Implementing Entity: United Nations Human Settlements Programme

Executing Entities: **Lebanon:** UNICEF; BWE; LARI; [RTO](#); UN-ESCWA
Jordan: UNICEF; JOHUD, HFDJB; MoWI/YWC; PRI; [Irbid & Mafraq municipal governments](#)

Amount of Financing Requested: USD 13,973,508

Project Background and Context

Introduction to the problems and needs

There is little exploration of how urban systems respond to the impacts of climate change combined with a rapid influx of new and often long-term residents. Considering the scale and nature of impacts of climate change and the Syrian crisis in the Mashreq region, an adequate response approach is needed, including concrete adaptation response measures and planning approaches that work in such context.¹

The Mashreq region is part of the most water scarce region in the world and both urban and rural areas face water challenges. However, some urban areas, especially in Lebanon and Jordan, experience extreme pressure on water availability, both in quantity and quality, exacerbated by climate change, the unprecedented influx of Displaced Persons (DPs), especially from Syria² and groundwater [over extraction](#) and pollution challenges.

The overall aim of this project is to better respond to climate change impacts and vulnerabilities in the context of the Syrian crisis in Jordan and Lebanon. This is done by demonstrating what concrete adaptation measures (see comp 3) respond to the needs of both DPs and host communities, and especially women and youth, while avoiding any tension over resources and employment opportunities.

The project will focus on responding to climate change-related water challenges by taking a sustainable water management approach. This means it aims to reduce the demand of unsustainable water sources such as over-extracted (and often polluted) groundwater, while increasing water supply options from non-conventional and more sustainable sources, incl. rainwater harvesting and the reuse of treated waste water (see comp 3).

The project will promote the replication and upscaling of the demonstrated techniques and approaches, also beyond Jordan and Lebanon (see comp 4), and to demonstrate how water resources can be assessed, planned and managed more efficiently at the municipal level (i.e. establish urban-rural linkages) and sustainably (by mainstreaming climate change and gender in municipal master plans) (see comp 1).

During project preparation, DPs in the target areas have been identified as the most vulnerable group due to their socio-economic situation and their dependence on often water-vulnerable sectors, especially the agriculture sector. However, to avoid supporting possible increased tension between DPs and host communities, the project also targets host community members. Assessment and planning processes under component 1 and capacity building activities under component 2 will target both DP and host community groups to avoid and even reduce any tension over scarce resources and job opportunities.

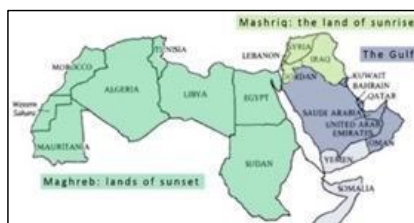
¹ World Bank et al (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge.

² Ibid

Arab region context

The Arab region is full of potential. Over the past decades, the region has seen significant economic and social progress. However, climate risks threaten to derail these development gains. This could disrupt efforts to build peace, cause a spike in 'eco-migrants,' and undermine efforts to end hunger, poverty and inequality by 2030.³

The Arab region is home to high levels of conflict and the world's largest population of refugees and displaced people. Simultaneously, it is now the planet's most water-scarce and food-import-dependent region, and the only region where malnutrition rates have been rising. The Arab region contains 14 of the world's 20 most water-stressed countries. In fact, the region's annual internal water resources amount only 6 percent of its average annual precipitation, against a world average of 38 percent. Overexploitation of natural resources in the region has led to severe ecosystem degradation. Poor land and water management are reducing the potential provision of already limited natural resource services.⁴



Urbanization and population growth are putting severe strains on dwindling natural resources. The population of the Arab countries, estimated at approximately 407 million (2016), with 100 million considered to be in poverty, is expected to reach approximately 635 million by 2050. The Middle East & North Africa (MENA) is the only region in the world where poverty increased between 2011 and 2016; and poverty is projected to increase further by 2030. With low human development index (HDI) rankings for many Arab countries and rampant poverty, the region is also facing internal conflicts over scarce natural resources such as conflicts between rain-fed farmers and pastoralists.⁵

The impacts of climate change are exacerbating the existing challenges of sustainably managing limited natural resources. Current climate change projections show that by the year 2025, the water supply in the Arab region will be 15 percent of the levels in 1960. By 2030 the predominant effects of climate change will include a decrease in precipitation, a drastic rise in average temperatures and an increase in seawater intrusion into coastal aquifers as sea levels rise and groundwater overexploitation continues. Climate change will also have disproportionate consequences for women, poor and marginalized communities who are especially at risk due to their dependence on natural resources.⁶

Lebanon and Jordan socio-demographic, economic and environmental context

The Syrian crisis

Now in its ninth year, the Syrian crisis has had a profound humanitarian, socio-economic, and political impact on the population in both Syria and its neighbouring countries. In recent years, millions of people have been displaced and migrated from Syria.⁷ Lebanon and Jordan are among the top DP's host countries: According to a study by UNHCR, Lebanon and Jordan are ranked the largest and second largest refugee-hosting countries in the world compared to the size of their national population, with 173 and 89 refugees per 1,000 inhabitants, respectively.⁸ This has placed unprecedented strain on the country's economy, infrastructure, and public services.⁹ Although some moved to camps, most (82 percent in Lebanon¹⁰ and 83.5 percent in Jordan¹¹) settle in cities, often in informal communities. Unfortunately, due to lack of planning and resources to respond to this large influx, many find themselves in communities that lack basic infrastructure and services, of which water challenges are seen as a major problem,¹² often leading to health and livelihood issues (as most DPs work in agriculture and this sector is heavily

³ UNDP / GEF (2018) Climate Change Adaptation in the Arab States Best practices and lessons learned. Online: <https://reliefweb.int/report/world/climate-change-adaptation-arab-states-best-practices-and-lessons-learned>

⁴ UNDP / GEF (2018) Climate Change Adaptation in the Arab States Best practices and lessons learned

⁵ Ibid

⁶ Ibid

⁷ The Syrian Arab Republic is the biggest sending country of refugees registered by UNHCR in the world (5.5 million out of a total of 18.5 million - UN-Habitat 2018. Migration and inclusive cities: A guide for Arab city leaders

⁸ <http://reporting.unhcr.org/node/2520>

⁹ The Government of Lebanon and the United Nations. (2019) *Lebanon crisis response plan 2017-2020 (2019 update)*. 2019 Edition. Lebanon: The Government of Lebanon and the United Nations.

¹⁰ Ibid

¹¹ UNHCR fact sheet, October 2019.

¹² See Jordan and Lebanon INDCs and Lebanon crisis response plan 2017-2020

dependent on water availability) and social unrest.¹³ Moreover, the majority of DPs from Syria live under the poverty line¹⁴ and lack legal residency making it difficult for them to secure income.

At the programmatic level, the Regional, Refugee and Resilience Plan (3RP) responds to the Syrian crisis and is conceptualized of two inter-connected components. The refugee component addresses the protection and humanitarian assistance needs of refugees living in camps, in settlements and in local communities in all sectors, as well as the most vulnerable members of impacted communities. The 3RP resilience component addresses the resilience, stabilization and development needs of impacted and vulnerable communities in all sectors, strengthens the capacities of national and sub-national service delivery systems, strengthens the ability of governments to lead the crisis response, and provides the strategic, technical and policy support to advance national responses.

Despite support from the National governments, civil society and the international community, the needs of affected communities are outpacing the resources and capacities of partners, and coping mechanisms of the most vulnerable are being severely tested. As there are limited numbers of Syrian DPs returning, there are worrying signs of heightened tensions and host-community fatigue. In this context, it is essential for the international community to maintain its solidarity and support, especially since there is a lack and decline in funding for support to countries like Jordan and Lebanon that face DPs crisis.¹⁵ The regional approach of this project aligns with the 3RP sector objectives, especially for the WASH sector (see annex 1 for more info).

Lebanon context

Lebanon is located on the eastern basin of the Mediterranean Sea, with a surface area of 10,452 km², a coastline extending on 225 km and a landscape characterized by mostly mountainous areas. Economic trends in Lebanon remain sluggish, with all segments of the economy struggling and competitiveness being undermined by the loss of major trading routes and regional markets, especially against the most recent political turmoil and demonstrations. Against this background, in 2017, Lebanon began developing its vision for stability and sustainable long-term growth and job creation, which is accompanied by important sectoral and structural reforms as well as a major infrastructure programme, the Capital Investment Plan (CIP).

The CIP calls for over \$20 billion in funding for 250 projects scheduled over the next decade, until 2030, focusing on investments in priority sectors, such as water, energy, transportation, and solid waste, among others.¹⁶ However, Lebanon faces important challenges, especially related to water resource management and the Syrian crisis.

Environmental and water challenges: Water resources in Lebanon are under stress. Available water, including from rivers and springs, storage dams and groundwater, exceed projected water demand.¹⁷ In 2010, total water supply reached 1,377 (MCM)/year originating from surface water (46 percent), groundwater (51 percent), and used storage (3 percent). Groundwater is over-extracted (0.7 BCM against total recharge of 0.5 BCM). In 2012, Lebanon was already using two thirds of its available water resources. This rate of water withdrawal is very high compared to global standards (averaging 10-30 percent), and includes a substantial component of resource mining, depleting Lebanon's water capital¹⁸. In addition, widespread pollution and substandard water infrastructure are restricting the ability of the government to meet water demands in the future.¹⁹

Lebanon is also generating ever increasing quantities of domestic and industrial wastewater, all of which requires treatment. The country has invested in wastewater facilities over the last two decades. As a result of this investment, about two-thirds of the population is connected to sewer networks but only 8 percent of wastewater reaches the operational wastewater treatment plants and is treated. A considerable amount of the installed treatment capacity is not being exploited.

¹³ <https://video.ecc-platform.org/videos/links-between-migration-and-climate-change>

¹⁴ UN 3RP: Regional Refugee & Resilience Plan 2018-2019.

¹⁵ Ibid.

¹⁶ UN for Lebanon annual report 2017

¹⁷ UNICEF Evaluation of the Water, Sanitation and Hygiene (WASH) Programme within the UNICEF Country Programme in Lebanon (2013-2016)

¹⁸ Ministry of Environment, EU and UNDP: Lebanon Environmental Assessment of the Syrian Conflict & Priority Interventions 2014

¹⁹ UNICEF Evaluation of the Water, Sanitation and Hygiene (WASH) Programme within the UNICEF Country Programme in Lebanon (2013-2016)

The environmental costs of this situation are severe. Most wastewater collected is discharged without treatment, into watercourses and the sea. Where there is no network, cesspits are used with considerable seepage into groundwater. Few industries pre-treat their effluent, so harmful waste is discharged into the sewer system or the environment. While all the water resources are being impacted by bacteriological contamination, in agricultural areas, the runoff and infiltration of fertilizer and pesticide residues is exposing these water resources to further environmental degradation. Furthermore, runoff from urban areas may contain heavy metals and hydrocarbons, which could impact the quality of receiving waters.

The negative environmental impacts of poor wastewater collection and treatment have the knock-on effects of increasing health costs, polluting water resources and soils, and reducing income from amenities and tourism. This situation is the result of years of political instability, poor planning and scattered responsibilities within the sector.

Demographic challenge: With a total population of 6,848,925 million in 2018,²⁰ Lebanon's population has almost doubled since 2000. The largest increase took place during the last decade, especially because of the large influx of DPs since the Syrian Crisis started in 2011. This relatively high population growth rate puts pressure on government spending to deliver basic public services, and to stimulate economic development. According to the latest WB Lebanon Economic Monitor report,²¹ 27 percent of the Lebanese population are poor and around 8 percent live in severe poverty conditions with less than 75 US dollars per month. The poverty rates in all Lebanon increased by 61 percent between 2011 to 2016. While the national unemployment rates passed the 30 percent, out of which 36 percent of youth groups from both genders. In the Bekaa governorate, the poverty rate is highest with 38 percent.

Economic and fiscal challenges: Economic growth (at constant factor process) for 2020 is expected to be -0.1 percent and 0.3 at constant market prices. This will be mainly driven by the agriculture and industry sectors. Public finances remain structurally weak and are expected to worsen and are in urgent need of reforms. Public debt continued to rise (155.6 percent of GDP expected in 2020), due to low growth and a relatively high cost of debt financing.²² However, these estimates remain uncertain due to the mass protests that swept across Lebanon shortly after the government announced new tax measures on 17 October and which are still ongoing.²³

DPs crisis: one of the key issues facing Lebanon is the **economic and social impact** of the Syrian crisis.²⁴ According to government and independent sources, up to 1.5 million Syrians, about a quarter of the Lebanese population, have taken refuge in Lebanon since the conflict erupted in March 2011. This has strained Lebanon's public finances, service delivery, and the environment. 76 percent of the Syrian DP households subsisted below the poverty line and more than 50 percent of Syrian households live in extreme poverty.²⁵ The crisis also worsened poverty incidence among Lebanese citizens as well as widen income inequality. In particular, it is estimated that as a result of the Syrian crisis, some 200,000 additional Lebanese have been pushed into poverty, adding to the erstwhile 1 million poor. An additional 250,000 to 300,000 Lebanese citizens are estimated to have become unemployed, most of them unskilled youth. According to the Lebanon Crisis Response Plan,²⁶ many of the most vulnerable communities in Lebanon are concentrated in specific pockets of the country: the majority of deprived Lebanese (67 percent) and persons displaced from Syria (87 percent) live in the country's most vulnerable cadastres, incl. in the Bekaa area (see also annex 1).

The Syrian conflict and the influx of DPs to Lebanon coincided with a period of severe water shortage, further stressing the scarce water resources and the under-developed water and wastewater infrastructure in the country. By the end of 2014, the incremental increase in domestic water demand for refugees was expected to reach 43 to 70 MCM, corresponding to an increase in water demand of 8 to 12 percent at the national level, with the Bekaa having the highest share. As for the wastewater generation rates, DPs

²⁰ World Bank (2019) *Population, total*. [Online] Available from: <https://data.worldbank.org/country/lebanon> [Accessed 10 January, 2020]

²¹ World Bank (2017). *Lebanon Economic Monitor*. [Online] Available from: <http://documents.worldbank.org/curated/en/568551493132224115/pdf/114552-v1-WP-PUBLIC-4-26-7AM-47p-LEM-Spring-2017.pdf>

²² World Bank (2019) *Macro Poverty Outlook: Country-by-country Analysis and Projections for the Developing World*. October 2019 Edition. World Bank

²³ Amnesty International (2020) *Lebanon Protests Explained: Mass demonstrations*. Available from: <https://www.amnesty.org/en/latest/news/2019/11/lebanon-protests-explained/> [Accessed 15 January, 2020]

²⁴ <https://www.worldbank.org/en/country/lebanon/overview>

²⁵ VASYR 2017: Vulnerability Assessment of Syrian Refugees in Lebanon

²⁶ <https://www.unhcr.org/lb/wp-content/uploads/sites/16/2019/04/LCRP-EN-2019.pdf>

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contribution was an increase of 34 to 56 MCM by the end of the year 2014, resulting in an increase of 8 to 14 percent in wastewater generation at the national level with the Bekaa having the highest share.²⁷

Host community fatigue is becoming more and more pronounced, and tensions between and within communities have been on the rise. Perceived competition for lower-skilled jobs was identified as a key driver for these tensions. Between 2014 and 2017, the percentage of Lebanese who did not report any inter-community tensions dropped from 40 to 2 per cent.²⁸ Most DPs (around 85 percent) settle in urban areas. The Bekaa valley, which is relatively close to Syria, hosts most of the Syrian DPs.²⁹

According to a recent labour survey dated the 16 of January 2020, and due to the ongoing economic crisis in the country and the large protests that raged in all Lebanese territories, the estimated number of people who lost their jobs as per December 2019 was 160,000 and the number is subject to increase. Imports of basic commodities have decreased from 500,000 tons in July 2019 to less than 250,000 tons in November 2019. The survival expenditure basket prices (especially food items) increased to merely 25% from October to December 2019.

According to CAS-ILO Household survey 2019, Lebanon labour force is segregated to 76% in services, 4% in Agriculture, 20% in industry. And seen the current situation, the threat to access local food products increased and the demand for basic food items between host Lebanese communities and refugees' communities also increased, this has also increased poverty rates according to sources. Versus, all these challenges, serious measures by the international community were established to enhance local agri-businesses. The latter remains also a challenge seen the urgent environmental challenges stated above especially those related to water depletion and pollution.

Jordan context

Jordan is located about 80 km to the East of the Mediterranean Sea. Located at the heart of the Middle East, Jordan is a middle-income country shaped by its geography, history, geopolitics and scarcity in natural resources.³⁰ Over the past ten years, Jordan has had success pursuing structural reforms in education, health and privatization and liberalization. The Government of Jordan has introduced social protection systems and reformed subsidies, creating the conditions for public-private partnerships in infrastructure and making tax reforms.³¹ However, the country faces important challenges. Macroeconomic vulnerabilities persist mainly due to its energy import dependency. Regional tensions and their recent extension to Iraq and Syria are weighing down on the Jordanian economy through a widening trade deficit and weaker investor confidence. According to the Department of Statistics unemployment rates reached 19.2 percent in the second quarter of 2019, male unemployment is at 17.1 while female unemployment is at 27.2 percent,³² youth unemployment (ages 15-24) according to ILOSTAT database was estimated at 36.7 percent in 2019.³³ Dependency on remittances from Gulf economies are additional threats to economic stability.³⁴

Environmental and water challenge: Issues in Jordan are to some extent similar to those in Lebanon. However, Jordan is an even more water scarce country. In fact, it is the second most water scarce country in the world. Water demand distinctly exceeds supply as the annual water availability per capita has declined significantly, from 3,600 m³ per capita in 1946 to only 145 m³ in 2008.³⁵ If supply remains constant, per capita domestic consumption is projected to fall to 90m³ per person per year by 2025, putting Jordan in the category of having an absolute water shortage that could constrain economic growth and potentially endanger public health.³⁶ Jordan requires about 1,400 MCM annually (2014) but has, on average, only 848 MCM of freshwater supply available for various uses. Non-revenue water accounts for approximately 50% of total water consumption. In 2014, 229.3 Million Cubic Meters (MCM) were lost, out of the 428.1 MCM delivered for municipal needs, the MoWI strategy includes the reduction of non-revenue water from

²⁷ Ministry of Environment, EU and UNDP: Lebanon Environmental Assessment of the Syrian Conflict & Priority Interventions 2014

²⁸ Regular Perception Surveys on Social Tensions throughout Lebanon (ARK, 2017), and Defining Community Vulnerability in Lebanon, REACH (2014).

²⁹ https://data2.unhcr.org/en/situations/syria/location/71#_ga=2.248854471.1978193527.1540994637-1966626473.1540994637

³⁰ Jordan TNC (2014)

³¹ Hashemite Kingdom of Jordan, UNICEF and UNDP (2015) Socio-economic inequality in Jordan

³² <http://dosweb.dos.gov.jo/19-2-unemployment-rate-during-the-second-quarter-of-2019-2/>

³³ <https://data.worldbank.org/indicator/SL.UEM.1524.ZS?locations=JO>

³⁴ Hashemite Kingdom of Jordan, UNICEF and UNDP (2015) Socio-economic inequality in Jordan

³⁵ MoWI (Ministry of Water and Irrigation, Jordan) (2009): Water for Life. Jordan's Water Strategy.

³⁶ National Climate Change Strategy of Jordan, 2013

52% to 25% by 2025.³⁷ The increased demand for water has caused over abstraction of water resources to reach 160 percent in 2014.³⁸ According to the Ministry of Water, of Jordan's 12 groundwater basins, 10 are being pumped at a deficit. Overall, groundwater is being extracted at twice the rate that it is replenished. In 2017, 50.3 percent of the Jordanian population had 24 h/week of piped water supply or less and 49.7 percent of Jordanians were listed with higher than 24 hsupply/week³⁹. This trend will make some areas unliveable, reduce agriculture lands and put more pressure on already scarce water resources, potentially increasing displacement, the continuous risk of social unrest and conflicts and migration to host settlements already struggling to provide basic services.

Demographic challenge: With a total population of 10,558,717 in 2020,⁴⁰ Jordan's population has grown very rapidly, doubling more than ten times in 55 years. The largest increase took place during the last decade, especially because of the large influx of DPs since the Syrian Crisis started in 2011. This relatively high population growth rate puts pressure on government spending to deliver basic public services, and to stimulate economic development. [Jordan registered an absolute poverty rate of 15.7 per cent for Jordanians only in 2018 while 78 per cent of the Syrian population is highly vulnerable, living below the Jordanian poverty rate⁴¹](#)

Economic and fiscal challenges: The elevated level of debt equivalent to 94.23 percent of Jordan's GDP in 2018 is of concern.⁴² As for the water sector, increased financing needs of the Water Authority of Jordan (WAJ), which is government owned, continues to pressure this debt situation as operation and maintenance cost recovery is not expected until 2021. Economic growth for 2019 is expected to be 2.4 percent.⁴³

DPs crisis: Jordan has a long history of accommodating DPs. However, the scale of the current DPs crisis compounds the existing socio-economic and environmental pressures in Jordan. There has been an increased competition for access to public utilities (water and electricity), education, health services, infrastructure, and employment, as well as pressure on the already limited carrying capacity of Jordan's natural resources. Similar to Lebanon, most DPs (around 83.5 percent) settle in urban areas. The Northern governorates of Irbid, Mafraq and Zarqa saw the largest influx of refugees relative to the total population,⁴⁴ leading to increased demand for public services.⁴⁵ Each Syrian refugee costs the water sector around 620 US\$/year⁴⁶.

Climate change

Lebanon

As mentioned in Lebanon's [Intended](#) Nationally Determined Contributions (INDC): 'adaptation is a priority for Lebanon. Being a developing country with scarce water resources and high population density, Lebanon is already facing and will continue to face, significant challenges as a result of climate change. The government of Lebanon recognizes that the more sustainable its development path is, the easier it will be to build resilience to climate change impacts.' Priority sectors are water, forestry & agriculture and biodiversity.

Climate: Lebanon has a Mediterranean-type climate characterized by hot and dry summers and wet and cool winters, with an average annual temperature of 15 °C. Lebanon has an arid / semi-arid climate, which makes it poor in water resources availability.⁴⁷

Climate change projections: According to climate models⁴⁸, temperatures are expected to increase with 1.7°C by mid-century and up to 3.2°C by 2100 and a decrease in precipitation of 4 to 11 percent with drier

³⁷ Ministry of Water and Irrigation: Water Facts and Figures 2017

³⁸ Jordan National Water Strategy 2016-2025

³⁹ Ministry of Water and Irrigation: Water Facts and Figures 2017

⁴⁰ Department of Statistics. Online. <http://dosweb.dos.gov.jo/>

⁴¹ [UNICEF. \(2018\). Geographic Multidimensional Vulnerability Analysis. Online: https://reliefweb.int/sites/reliefweb.int/files/resources/Summary%20English.pdf](#)

⁴² <https://tradingeconomics.com/jordan/government-debt-to-gdp>

⁴³ World Bank. Online: <https://data.worldbank.org/country/jordan>

⁴⁴ https://data2.unhcr.org/en/situations/syria/location/36#_ga=2.22371195.1978193527.1540994637-1966626473.1540994637

⁴⁵ Hashemite Kingdom of Jordan, UNICEF and UNDP (2015) Socio-economic inequality in Jordan

⁴⁶ Ministry of Water and Irrigation: Water Facts and Figures 2017

⁴⁷ Lebanon TNC (2016)

⁴⁸ Ibid

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conditions by the end of the century (up to 5.8 mm decrease in average monthly precipitation). Projections also show increasing trends of warming, reaching up to 43 additional days with maximum daily temperature higher than 35°C and an increase in the number of consecutive dry days when precipitation is less than 1.0 mm by the end of the century, causing the seasonal prolongation and geographical expansion of drought periods. This combination of significantly less wet and substantially warmer conditions will result in hotter and drier climate.

Climate change impacts (on vulnerable sectors and areas), including the water sector: The projected changes in rainfall will put tremendous pressure on national water security and produce knock-on effects in sectors such as agriculture, where around 70 percent of the available water is being used for irrigation. The decline in precipitation will also negatively affect the recharge of rivers and groundwater. Snow will melt earlier in spring, affecting spring recharging and decreasing water availability for irrigation in summer. Annual drought periods are expected to start 15 days to 1 month earlier and will be 9 days longer by 2040 and 18 days longer by 2090. The already dry regions, such as the Bekaa, Hermel, and the South, will experience the sharpest effects. In Zahle, projections show a 6-15 percent decrease in the annual total rainfall (mm)/number of days by 2098 under the SRES A1B scenario.⁴⁹ Anticipated changes in climate would reduce the nation's exploitable supplies of water by about 8 percent in 2040, and 29 percent in 2080⁵⁰. (This is even aggravated by the fact that water demand in Lebanon increased 28 percent between 2011 - 2017, which is directly linked to the Syrian crisis.⁵¹ For more info about climate change scenarios and vulnerabilities in the project target areas see annex 1. An Inter-Agency vulnerability mapping based on several criteria⁵², showed that central Bekaa cadastres are classified as most vulnerable due to the Syrian crisis with high pressure on resources. A similar exercise at district level was conducted jointly by UN-Habitat and UNICEF in 2018, where a workshop was held with stakeholders⁵³ selected for their district-wide knowledge. The outcome was a ranking of disadvantaged areas.⁵⁴ Subsequently, the score was coupled with the respective Multi-section Vulnerability Index (MsVI)⁵⁵ score of an area's cadastre. The study showed that the Bekaa area and its population is vulnerable to climate change, especially water and related agriculture production and dependence on this sector for income, especially for Syrians.

Jordan

As mentioned in Jordan's National Climate Change Policy: 'Jordan faces potential serious impacts on its natural ecosystems, on its river basins and watersheds, on biodiversity—then cascading to impacts on food productivity, water resources, human health, public infrastructure, and human settlements. Climate change will have serious implications on the country's efforts to eradicate poverty and realize sustainable development for current and future generations— ultimately making climate change an issue of intergenerational equity. Climate change scenarios indicate that Jordan and the Middle East could suffer from reduced agricultural productivity and water availability among other negative impacts.'

Climate: Jordan is located about 80 km to the East of the Mediterranean Sea with a predominantly Mediterranean climate; hot and dry summers and wet and cool winters. Jordan is divided into three main climatic regions: the Ghor region (lowlands), Highlands, badia and Desert region.⁵⁶

Climate change projections: Climate models⁵⁷ show a consistent trend towards a drier climate and annual precipitation tends to decrease significantly with time. The mean and maximum temperatures over the full country of Jordan will be 2-4 degrees higher, precipitation will be 15-20 percent lower and potential evapotranspiration about 150 mm higher by the end of the century. The decrease in precipitation would be more prevalent in the western part of the country. Simultaneously, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively. On the other

⁴⁹ Ministry of Environment and UNDP (2011) Lebanon Second National Communication on Climate Change – Public Health

⁵⁰ Lebanon Third National Communication on Climate Change

⁵¹ Lebanon crisis response plan 2017-2020

⁵² Using Multi Deprivation Index (MDI) at household level.

⁵³ Stakeholders involved governmental representatives, including the qaem maqam (head of a district), head(s) of union(s) of municipalities of a district, and representative(s) of Social Development Centre(s) (SDC(s)); local stakeholders (civil society organizations and local non-governmental organizations); representatives of UNICEF zonal offices; and UN-Habitat area coordinators.

⁵⁴ Criteria were: (1) extreme poverty, (2) presence of refugee population, (3) existence of slums/substandard housing, (4) out-of-school/working children, (5) frequency of incidence of violence in the community, (6) overburdened public services, and (7) deficiencies in basic urban services.

⁵⁵ Developed by UNICEF Lebanon (in 2017) as a child-focus vulnerability index.

⁵⁶ Jordan TNC (2014)

⁵⁷ Jordan's Third National Communication Report to UNFCCC (2014)

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hand, the relative humidity tends to increase significantly by an average of 0.08 percent/year. In addition, projection show that heat waves and drought events, dry days will be more frequent.

*Climate change impacts (on vulnerable sectors and areas), including the water sector: [Jordan's Third National Communication \(TNC\) Report to UNFCCC](#)⁵⁸ has developed a socioeconomic analysis to determine expected vulnerabilities and impacts of climate change on local communities and their adaptive capacities by employing socioeconomic and adaptation analysis tools on the pilot area composed of four villages in the Amman- Zarqa Basin, near Irbid and Jerash, two main territories of the three regions of this proposal. The study used the *income* (and climate sensitive employment assessment) as a main critical indicator to the sensitivity of local community to the climate change. The importance of these indicators is linked to the impacts of climate change on the yield agricultural productivity at the study site especially that 54.47 percent of the community income based on agriculture which was considered the most sensitive sector to climate change.* Previous studies and strategic documents (i.e. Jordan's SNC (2009) and National Climate Change Policy (2013), Jordan's TNC (2014) have identified scarcity of water resources as one of the major barriers facing sustainable development in Jordan; a situation that will be magnified by climate change,⁵⁹ leading to more water stress. Due to climate change-induced drought, the average agricultural production declined by 25–50 percent in 1999–2000 and agricultural production entirely failed in many areas of land. Furthermore, wheat production declined by 12–20 percent of the total average, and the productivity of rangelands declined by 50 percent. In that season, agricultural production losses as a result of drought were estimated at around US\$57 million. More recently, the latest figures show that rainfall in September 2014 was less than half the average expected⁶⁰. Water-related impacts also include reduced total water availability, less reliable seasonal patterns, increasing intensity of droughts during which reservoirs are not refilled, and groundwater does not recharge. Flood events will also be more likely, in 2018 flash floods claimed 35 lives and affected 150,000 people.⁶¹ High rainfall events also increase erosion which causes losses of soil water storage and siltation of reservoirs. Higher temperatures cause higher evaporative demand and hence higher irrigation water demand. Higher temperatures also affect the efficiency of wastewater treatment plants.⁶² Jordan has been subjected to additional water stress due to the influx of displaced peoples, especially from Syria. There are indications of pollution of the main aquifer lying beneath the Zaatari camp due to wastewater leakages. Besides that, groundwater, including the Amman-Zarqa aquifer,⁶³ is being overpumped. For more info about climate change scenarios and vulnerabilities in the project target areas see annex 1.

Climate change vulnerabilities assessment and hot-spot mapping approach

Global-, MENA and National climate change models and data have been used to understand climate change trends and projections in Jordan and Lebanon and to justify this project, focused on addressing water-related challenges in the target areas in both countries.

Target areas / municipalities have been selected by identifying which areas experience most pressure on water-related services, exacerbated by climate change impacts and the influx of DPs. Irbid and Mafrq in Jordan are the municipalities that host most DPs after Amman. In Lebanon, the Bekaa area, in which Zahle and the three surrounding target municipalities are located, hosts most DPs. See Annex 1 for more info. As labelled by the WB,⁶⁴ cities under widespread stress from displaced persons – which significantly impacted the overall absorption capacity, including urban systems and services such as water supply (exacerbated by climate change), sanitation, education, and health services, are called 'type 2' cities.

During project preparation, data has been collected required to map climate change vulnerable hotspots (see approach in figure 2 below) and develop response plans (i.e. identify appropriate adaptation measures) to address specific vulnerabilities in these hotspot areas. This has been done through a

⁵⁸ [Government of the Hashemite Kingdom of Jordan & UNDP \(2014\). Jordan's Third National Communication on Climate Change \(Government of the Hashemite Kingdom of Jordan & UNDP, 2014\).](#)

⁵⁹ Ibid

⁶⁰ UNEP 2015: Climate Change in the Arab Region (Regional Coordination Mechanism Report)

⁶¹ UNDP/ National Centre for Security and Crises Management (NCSCM): Jordan National Disaster Risk Reduction (DRR) Strategy 2019-2022

⁶² Jordan Ministry of Water and Irrigation: Climate Change Policy for a Resilient Water Sector, 2016, page 3

⁶³ UN-ESCWA et al. (2017) Arab Climate Change Assessment Report (RICCAR initiative)

⁶⁴ World Bank et al (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge

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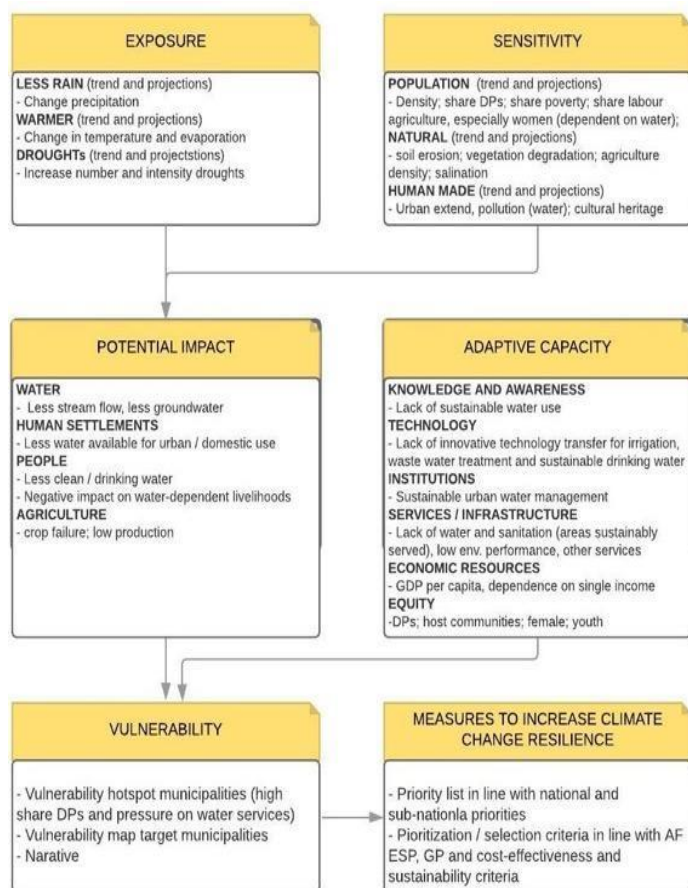
combination of research and a comprehensive planning and consultation process (see section II.I), including with vulnerable groups.

Figure 1: Typology of settlements⁶⁵



Figure 2: Climate change vulnerability assessment and hotspot mapping approach (UN-ESCWA approach)

⁶⁵World Bank et al (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge



Project target areas

There is evidence⁶⁶ that water challenges will likely grow for Irbid, Mafrq and Zahle and surrounding municipalities in the future due to climate change impacts. There is also a clear link between the influx of Syrian DPs and increasing pressure on water resources in these areas. Both challenges are coupled with adaptation challenges in both countries. Common adaptation challenges for the two countries are financial constraints to implement climate action. For example, the financial deficit in the municipality budget for Greater Mafrq has reached 107 percent due to the impact of the influx of Syrian DPs⁶⁷. Also, there is a lack of awareness at the community level, weak coordination between relevant authorities and a need to spend more on research and capacity building to apply low-cost innovative solutions.⁶⁸

Many of the DPs have now been in the host country for five or more years. As most DPs live in cities, solutions focused on their needs and negative climate change impacts must target host cities and towns.⁶⁹ The shift from a focus on camps to cities and towns means changing the paradigm for how humanitarian and development agencies work with DPs. Instead of providing stand-alone solutions to DPs in camps or rural areas, the challenge is to establish urban – rural linkages and support host communities to adapt /

⁶⁶ See sections above

⁶⁷ ILO (2016) Local Economic Development Strategy For Mafrq Governorate (2016-2018)

⁶⁸ Jordan Third National Communication on Climate Change and Lebanon Third National Communication on Climate Change

⁶⁹ Idem page 21

scale up existing services, shelter and jobs to meet the needs of both the original residents and DPs,⁷⁰ considering the impacts of climate change, especially increasing water challenges, on these services.

The Jordan Refugee Response Plan identifies the Northern region as highly vulnerable (including Irbid) while the East (Mafrqa) is the second highest region in the percentage of DPs rated highly vulnerable or above.⁷¹ Syrian DPs in Jordan and Lebanon are specifically vulnerable to climate-induced water challenges. The Vulnerability Assessment Framework 2019 shows 11 percent of the Syrian DP population as having high or severe VAF WASH indicator vulnerability, while this indicator might appear very low, sub-indicators reveal much higher levels of vulnerability, namely expenditure on WASH items, 58 percent reported spending more than five per cent of expenditures on water.⁷² In Lebanon, 42 percent of households rely on bottled water.⁷³ In Bekaa, Lebanon—where Zahle is located—the unemployment rate (unemployed over labour force), 61.9 percent, is the highest amongst all Lebanese Governorates and almost double the total unemployment rate nationally (31.3 percent). Moreover, the Bekaa Governorate is the second lowest when measuring the percentage of “households with members working in the past 7 days” with an average of 36.4 percent compared to the lowest 30.1 percent in Baalbek El-Hermel Governorate and as compared to 59.4 percent nationally.⁷⁴

In addition, there is a number of specific challenges across the region, including limited job access and livelihoods opportunities, exhaustion of savings, and the adoption of negative coping mechanisms, which further exacerbate the residual protection risks they face. Broader political and social pressures can also affect stability between displaced populations and host communities in both countries. There are over 10,000 Syrian displaced children recorded in the Arab region as either separated, unaccompanied or in institutional care.⁷⁵ The loss of social networks further decreases the adaptive capacities and make DPs more vulnerable to climate change. The 2015 population census⁷⁶ estimates the population of Irbid governorate at 1,770,158 (Syrian DPs 134,649)⁷⁷, Qasabit Irbid, Bani Obeid and Ramtha target area populations are estimated at 739,212 (Syrian DPs 165,843), 204,313 (Syrian DPs 48,574) and 238,502 (Syrian DPs 68,306) respectively. The population of Mafrqa governorate was estimated at 549,948 (Syrian DPs 161,977⁷⁸), Qasabit Mafrqa, Al-Ghadeer Al-Abyad and Akaider targeted area populations are estimated at 124,479 (Syrian DPs 39,359), 1,661 (Syrian DPs 166) and 1,649 (Syrian DPs 165) respectively. Disaggregated data and the overview of climate change concerns for each target area are shown in Tables 1 and 2.

Lebanon



Figure 3: Target municipalities in Lebanon

⁷⁰ Idem
⁷¹ UNHCR (2015) Jordan Refugee Response Plan
⁷² UNHCR (2019) Vulnerability Assessment Framework <https://data2.unhcr.org/en/documents/download/68856>
⁷³ UNHCR, UNICEF and WFP. (2019) VASyR 2019: Vulnerability Assessment of Syrian Refugees in Lebanon.
⁷⁴ Ibid
⁷⁵ UN 3RP: Regional Refugee & Resilience Plan 2018-2019
⁷⁶ Jordan in Figures 2017 - Page 7 <http://dosweb.dps.gov.jo/DataBank/JordanInFigures/JORINFIGDetails2017.pdf>
⁷⁷ UNHCR - <https://data2.unhcr.org/en/situations/syria/location/36>
⁷⁸ Ibid

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Zahle and surrounding area lies in central Bekaa valley and has an annual rainfall of between 200-600 mm⁷⁹. Figure 3 shows the administrative boundaries of Zahle and the surrounding municipalities. The target areas in Zahle have been identified based on a high share of vulnerable communities. The total populations and disaggregated data and an overview of climate change issues and adaptation needs for each municipality are shown in table 1.

Figure 4 shows communities in most need of water resources, which have been combined with figure 5, which shows poverty distribution in Zahle area among vulnerable Lebanese communities (living under 4US\$ per day, as per the World Bank data, 2011) and location of vulnerable Syrian displaced population living in Informal Tented Settlements (ITSs). The maps also show the land cover with agricultural and built areas, which has been used to identify vulnerable farmers and vulnerable urban populations.

Figure 4: target areas in need of water

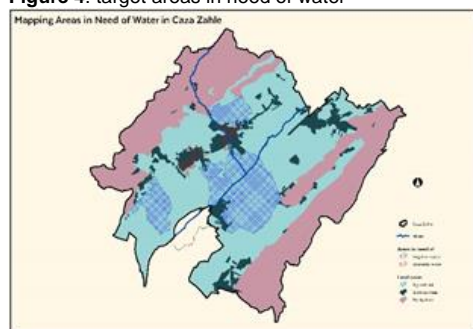
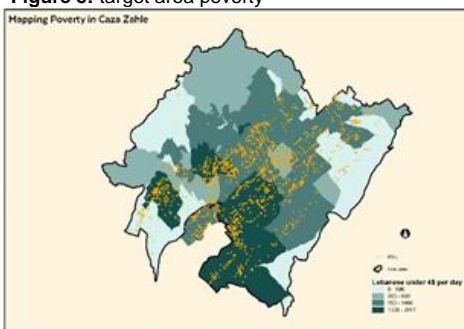


Figure 5: target area poverty



Focus group consultation and key informant interviews have been held in the target municipalities (see section II.I.) with the purpose to identify specific issues and needs regarding climate change-related water issues and possible concern regarding proposed adaptation actions (see outcomes in table 1). Drought has been identified as the most problematic hazard in the city of Zahle and its surrounding municipalities during the past 10 years. In general, the surrounding municipalities suffer from extreme heat that has been increasing, especially in the years between 2016 and 2018. In 2017 and 2018, flooding has also been a major concern for the target areas. This trend coincides with the predictions of Lebanon's Third National Communication to the UNFCCC for generally prolonged drought periods all over the country, increase in average temperature and increase in winter flooding by up to 30 percent.

Moreover, according to climate predictions from the PRECIS model, by 2040 temperatures will increase from around 1°C on the coast to 2°C in the mainland, and by 2090 they will be 3.5°C to 5°C higher. Rainfall is also projected to decrease by 10-20% by 2040 and by 25-45% by the year 2090, compared to the present. This combination of significantly less wet and substantially warmer conditions will result in an extended hot and dry climate. Temperature and precipitation extremes will also intensify. The drought periods, over the whole country, will become 9 days longer by 2040 and 18 days longer by 2090 (MoE, 2011).

Zahle: During the past 8 years, the amount of rainfall and upstream melting snow serving the area has noticeably decreased, causing boreholes to dry out in the summer in addition to becoming increasingly contaminated. The agriculture sector is especially vulnerable, not only to climate change-related increased water scarcity, but also groundwater pollution. As most of the Syrian DPs work in this sector, their jobs are dependent on the resilience of the sector and the use of non-conventional clean water resources. For instance, Haouch El Oumara's targeted community of host Lebanese population in Zahle has identified drought and extreme heat as the main climate change hazards in their area, especially in the years 2017 and 2018. The rainfall season shifted to the end of winter- beginning of spring, with heavy downpours. As a result, water infiltration into the underground water table has reduced and so has lowered the water table.

⁷⁹ Farajalla et al. (2014): Climate Change in Lebanon: High-order Regional Impacts from Agriculture http://website.aub.edu.lb/ifi/publications/Documents/working_papers/20140722_Higher_order_CC.pdf

Twenty years ago, the water table in summer was 80 m underground in Zahle and nowadays one has to dig to 150 m to reach the water table. Existing boreholes are drying out in summer and supplying less water in winter. Farmers started digging deeper boreholes to reach the water table. This water scarcity has increased the cost of crop production due to the need to pump water from deeper boreholes. As a result, some farmers have lost their livelihoods as they are failing to compete with cheaper imported products. This has also caused farmers to use the polluted water of Litani River, which in turn increased diseases in the surrounding area. According to the community, Lebanon is the third in the world in the rate of cancer, with the central Bekaa area (around Litani River) having the greatest share of cancer patients (800 cases in Bar Elias alone). These water scarcity issues have been also exacerbated by the increased temperature that increased the water need for plants as well as caused crop damages and spread of new types of insects. Consequently, farmers are using pesticides more often.

Bar Elias, Ablah, Hazerta, El-Marj, Ferzol, Qaa El-Rim, Taanayel, Taalabaya and Terbol: Similar to Zahle, all areas in the Bekaa region have witnessed various water-related problems. It is said that factories, mainly located in Zahle, and sewage lines in the area have been dumping their waste in the Litani River without prior treatment. This has heightened reported health problems, and which include the spread of diseases and elevated cancer rates in the Bekaa. Also, the residents have addressed concerns related to the presence of bad odours in and around the area. Drought and flood incidents have led to crop damage, surface water pollution and decreased water quality and groundwater depletion.

Qab Elias and Saadnayel: The drinking water being distributed (e.g. by World Vision in Qab Elias is not enough for all the ITSs and at the same time boreholes are drying out in summer due to the increasing drought incidents. Due to the fact that 68 percent of the targeted communities in both municipalities are unemployed, most of the community cannot afford to buy drinking water and so collect water from untested water sources. Since women and children are responsible for domestic work and water supply, they are facing safety issues while walking away from ITS to collect water. Another safety concern—especially for children, elderly and disabled people—is the damage caused by the increased flooding causing loss of shelter. This is in addition to the fires in ITS due to increased heat that melts electrical wires. Skin diseases have also spread among the community due to decline in hygiene caused by water scarcity. While other diseases such as respiratory diseases and fever have increased mainly among children due to increased temperature which also caused an increase in the numbers of insects and rodents. The river stream dries in summer and so is filled with wastewater which has also caused spread in insects and rodents carrying diseases. However, government priorities don't focus on the ITSs.

The agriculture sector in Zahle district is mainly fed by conventional water systems, such as water channels, open water sources and other badly operated drip irrigation systems. The main two rivers are the Berdawni river (a seasonal river) and the Litani river. Based on several reports, the Litany is highly subjected to pollution mainly due to municipal wastewater and industrial waste. This pollution has also affected the agri-businesses in the region, yet affecting livelihoods of several farmers in the area.

For an overview of the main climate change issues and needs in target areas in Lebanon see table 1.

Table 1: overview of main climate change issues / vulnerabilities and needs in target areas in Lebanon

Municipal ity	Population	Main climate change impacts / Hazards (exposure)	Effects on communities and vulnerable groups (sensitivity)	Barriers to adapt (adaptive capacity)	Priority resilience building interventions	Issues and concerns (identified through consultations) and response needs
Bar Elias	Total population count: 69,124 Women: 35,514 Youth: 3,802 Syrians: 39,124	<ul style="list-style-type: none"> - Drought - Flooding - Extreme heat 	<p>Drought:</p> <ul style="list-style-type: none"> - Water Scarcity in urban areas - Add financial burden to families due to lack of adequate drinking water - Agriculture/ crop failure with significant impact on Syrian DPs <p>Extreme heat:</p> <ul style="list-style-type: none"> - Increase in agricultural water demand - Increase of pests and other insects which damage crops and bring about diseases - Change in agricultural patterns and evident decline in livestock production - Low air quality resulting in heightened level of pollutants <p>Flooding:</p> <ul style="list-style-type: none"> - Loss of shelter and safety risks for vulnerable groups (mainly displaced persons, women, elderly and children) - Limited mobility - Spread of diseases - Leachate seepage 	<ul style="list-style-type: none"> - Lack of adequate water supply - Lack of funding - Lack of capacity - Lack of awareness about water scarcity and water conservation strategies. - Absence of legislations to cope with climate change - Legal restrictions on supplying piped water to ITS - Poverty of: 26 percent 	<ul style="list-style-type: none"> - Clean water, e.g. through rooftop rainwater harvesting and reuse, and permaculture and a Constructed Wetland - Awareness on water scarcity and water conservation strategies - Guidelines including Climate Change Adaptation measures, land use and water scarcity issues 	<ul style="list-style-type: none"> - Harvested water can be polluted (need quality control and awareness) - Harvested and treated stormwater can only be used for domestic reuse and irrigation purposes - Maintenance of rainwater harvesting system (need maintenance plans) Service provision disparities - Service provision disparities - Resistance on the use of harvested/treated water due to lack of awareness - Operation and maintenance (first year guidelines followed thereafter by continued routine guidelines)
Hazerta, El Marj, Saadhaye I, Taanaye I, Taalabay a, Terbol, Ferzol	Total population count: 98,507 Women: 49,301 Youth: 5,454 Syrians: 55,827	<ul style="list-style-type: none"> - Drought - Flooding - Extreme heat 	<p>Drought:</p> <ul style="list-style-type: none"> - Water Scarcity in urban areas - Add financial burden to families due to lack of adequate drinking water - Agriculture/ crop failure with significant impact on Syrian DPs <p>Extreme heat:</p> <ul style="list-style-type: none"> - Increase in agricultural water demand - Increase of pests and other insects which damage crops and bring about diseases - Change in agricultural patterns and evident decline in livestock production - Low air quality resulting in heightened level of pollutants <p>Flooding:</p> <ul style="list-style-type: none"> - Loss of shelter and safety risks for vulnerable groups (mainly displaced persons, women, elderly and children) - Limited mobility - Spread of diseases - Leachate seepage 	<ul style="list-style-type: none"> - Lack of adequate water supply - Lack of funding - Lack of capacity - Lack of awareness about water scarcity and water conservation strategies. - Absence of legislations to cope with climate change - Legal restrictions on supplying piped water to ITS 	<ul style="list-style-type: none"> - Clean water, e.g. through rooftop rainwater harvesting and reuse - Awareness on water scarcity and water conservation strategies - Guidelines including Climate Change Adaptation measures, land use and water scarcity issues 	<ul style="list-style-type: none"> - Harvested water can be polluted (need quality control and awareness) - Harvested and treated stormwater can only be used for domestic reuse and irrigation purposes - Maintenance of rainwater harvesting system (need maintenance plans) - Service provision disparities - Resistance on the use of harvested/treated water due to lack of awareness - Lack of commitment and financing to apply adaptive measures to Climate Change

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Zahle	Total population count: 184,332 Women: 94,705 Youth: 10,140 Syrians: 104,332	<ul style="list-style-type: none"> - Drought - Flooding - Extreme heat 	<p>Drought:</p> <ul style="list-style-type: none"> - Water Scarcity in urban areas - Add financial burden to families due to lack of adequate drinking water - Agriculture/ crop failure with significant impact on Syrian DPs <p>Extreme heat:</p> <ul style="list-style-type: none"> - Increase in agricultural water demand - Increase of pests and other insects which damage crops and bring about diseases - Change in agricultural patterns and evident decline in livestock production - Low air quality resulting in heightened level of pollutants <p>Flooding:</p> <ul style="list-style-type: none"> - Loss of shelter and safety risks for vulnerable groups (mainly displaced persons, women, elderly and children) - Limited mobility - Spread of diseases - Leachate seepage 	<ul style="list-style-type: none"> - Lack of money to buy drinking water - Lack of adequate water supply - Lack of funding - Lack of capacity - Lack of awareness about water scarcity and water conservation strategies. - Absence of legislations to cope with climate change - Legal restrictions on supplying piped water to ITS - Poverty of 38 percent - <u>45% of Lebanese households have insecure food consumption where the majority of the population live from agriculture (LCRP 2019)</u> 	<ul style="list-style-type: none"> - Clean water for agriculture, e.g. through rooftop rainwater harvesting and reuse and through treated water from upgraded WWTP (partial diversion of the treated discharge into an open canal) - Reduced agricultural water losses through water efficient drip irrigation - Awareness on water scarcity and water conservation strategies - Guidelines including Climate Change Adaptation measures, land use and water scarcity issues 	<ul style="list-style-type: none"> - Treated wastewater will only benefit farmers - Harvested water can be polluted (need quality control and awareness) - Harvested and treated stormwater can only be used for domestic reuse and irrigation purposes - Maintenance of rainwater harvesting system (need maintenance plans) - Service provision disparities - Resistance on the use of harvested/treated water due to lack of awareness - Unwillingness to pay tariffs for wastewater collection and treatment, and for sludge treatment and reuse
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Based on UN-Habitat vulnerability assessment conducted in target area (through consultations). Details of surveys and consultation outcomes can be shared on request

Jordan

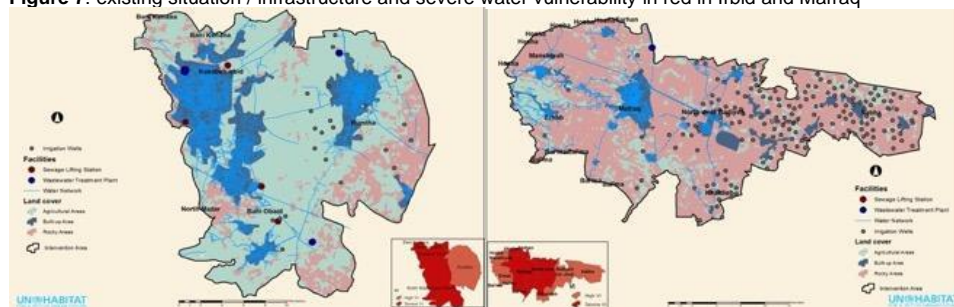
Irbid is located in Jordan's wet region the total annual rainfall in this region varies between 400 and 600 mm while Mafraq on the other hand is located within the dry region in the east, where average rainfall annually varies between 100 and 300 mm (see figure 6). The total populations and disaggregated data and an overview of climate change issues and adaptation needs for each municipality are shown in table 2.

According to focus group consultation and key informant interviews conducted within the target areas in Jordan (see section II.I), the increase in temperature and the decline in rainfall which leads to drought are two of the most hazardous climate change impacts in both Mafraq and Irbid. This confirms the outcomes of Jordan's Third National Communication⁸⁰ to the UNFCCC based on long historical data obtained from Jordan Metrology Department (JMD) that predicted a serious decline in precipitation trends, both the Mann-Kendall rank trend test and linear regression trends indicate that the annual precipitation tends to decrease significantly with time at a rate of 1.2 mm per year, and according to the results of the Second National Communication⁸¹ (SNC) by 2070-2100, the cumulated precipitation could likely decrease by 15%. TNC findings also show significant increase in the temperature, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively. For the Water Sector in particular, results revealed that based on the climate trends analysis using CORDEX and RCP 4.5 and 8.5 the main climate hazards that the water sector faces in Jordan are temperature increases, increased incidents of drought, increased evaporation, and precipitation decreases. The TRAIN model suggests up to a 50 per cent decrease in water availability in northwest Jordan (HadCM3, A1B scenario, 2021–2050 compared with 1961–1990 control period). An overall increase in local and regional irrigation demand has serious implications for Jordan since further stress will be put on the groundwater resource. While on the other hand, in some target areas, flooding has also been pointed out as a major hazard. This is also in line with the predictions of a higher intensity of flooding in Jordan due to climate change⁸².



Figure 6: annual average rainfall in target areas

Figure 7: existing situation / infrastructure and severe water vulnerability in red in Irbid and Mafraq

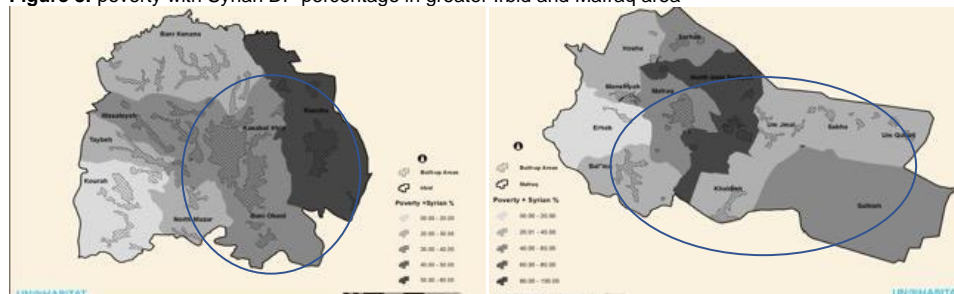


⁸⁰ Third National Communication Report of Jordan to UNFCCC (2014), UNDP and Jordan Ministry of Environment.

⁸¹ Second National Communication (SNC) to UNFCCC (2009). UNDP and Jordan Ministry of Environment.

⁸² Jordan Ministry of Water and Irrigation: Climate Change Policy for a Resilient Water Sector, 2016, page 3

Figure 8: poverty with Syrian DP percentage in greater Irbid and Mafraq area



Besides natural population growth, the target areas selected suffer from increased water demand mainly due to the influx of Syrian DPs, impacts of climate change are projected to raise water deficits in Jordan particularly in the northern part where the influx of refugee has worsen the situation. Syrian DPs live in the same urban areas as Jordanians and so are subject to the same impacts. However, Syrian DPs have higher vulnerability due to the fact that they are likely to have a lower net income than the average Jordanian family. In agricultural areas, the livelihood of Syrian DPs heavily depends on job opportunities at Jordanian farms and so are affected by any decline or change in agricultural activities.

Figure 7 shows the build-up area in greater Irbid and Mafraq with existing water infrastructure. In red, the area with severe water vulnerability (according to UNICEF) is shown. Figure 8 shows the share of poverty with Syrian DP percentage in greater Irbid and Mafraq. The cities fall in the category 30-40 percent poverty / DPs.

Mafraq Governorate:

Qasabit Al Mafraq: The two most problematic climate change hazards identified throughout the focus group discussions were; flooding and drought. The area has been experiencing an increase in the frequency of flood occurrence and decline in precipitation levels. Which have led to a decline in water table and groundwater level, resulting in water scarcity. Water is being pumped to households once a week and houses with small tanks do not store enough water. Flooding and water scarcity have an adverse effect on residents of the area, floods damage many households causing displacement, forcing absence from workplaces and schools which affects families income. An increase in the number of insects and rodents is prevalent. Water scarcity adds a financial burden to families that resort to purchasing water, especially Syrian families who usually have less net income than Jordanian families. It also causes psychological and physical stress to stay-at-home moms who stay up late at night to make use of the water supplied once a week in laundry, cleaning and other household purposes. Drought has caused a decline in agricultural and livestock production in the surrounding areas, affecting the livelihoods of Jordanian farmers and Syrian DPs working on farms.

Al Ghadeer Al Abiad: Farmers identified drought and extreme weather (heat and cold) as the two most significant climate change hazards in the past 10 years. The change in the patterns of rainfall results in deteriorating cultivated crops such as wheat and barley and forcing farmers to shift from rain fed to irrigated agriculture. According to farmers, reclaimed water is becoming more expensive. Extreme weather in summer and winter has damaged crops and caused economic losses to farmers. Farmers can no longer rely on rain fed agriculture to make a living. Due to water scarcity, farmers are becoming more dependent on reclaimed water. Farmers are forced to receive reclaimed water even at times when irrigation isn't that high (e.g. during rainy season) reclaimed water cannot be stored for more than a few days as its quality will extremely deteriorate resulting in serious health risks. Livelihoods of Syrian DPs who work on Jordanian farms are also negatively affected by these impacts. Less farmers are required due to the decline in livestock and agricultural production caused by drought.

Irbid Governorate:

Qasabit Irbid: Flooding and drought are the two most hazardous climate change impacts affecting the area. Increased frequency of flooding- which occurs mainly in winter- over the past few years. drought caused by decline in rainfall and water scarcity caused a shortage in supplied drinking water. Floods

impose safety risks and limits the mobility of residents, specifically; children, disabled and elderly. It may result in displacement among the population living in wadi (valley) areas in addition to damage to houses and infrastructure. Flooding increases the number of insects and rodents which increased diseases among children. Women and children mainly remain at home during flooding. Drought has severely affected households, exacerbated by Syrian DPs influx, water scarcity caused a shortage in supplied drinking water adding a financial burden to families as they need to purchase drinking water from the private market, which is not subsidised. . It also causes psychological and physical stress to stay-at-home moms who stay up late at night to make use of the water supplied once a week in laundry, cleaning and other household purposes. Drought also caused a shrinkage in the agricultural area and changes in the vegetation cover. For example, the supply of olive oil has dramatically decrease and with much higher prices.

Bani Obead: Drought, extreme heat and flooding have been identified as the most hazardous climate change impacts in the target area.

Water scarcity caused a shortage in supplied drinking water, drought causes shrinkage in agricultural area and flooding causes safety hazards. Exacerbated by influx of Syrian DPs, water scarcity caused a shortage in supplied drinking water adding a financial burden on families that resort to purchasing drinking water from the private market which is not subsidised. It has also affected personal hygiene especially among children. Drought also caused a shrinkage in the agricultural area. The agricultural pattern has also changed due to increased temperature with a decline in wheat and clover. Temperature which used to reach 35°C can now reach up to 45°C in summer according to the community members causing spread of mosquitos and emergence of diseases that are new to the area. Floods damage houses and infrastructure hindering mobility.

Ramtha: Drought and extreme weather (heat and cold) were identified as the two most significant climate change hazards in the past 10 years by local farmers. The preliminary predictions of the CROPWAT model suggest that, at Ramtha in northwest Jordan, the irrigation demand will increase from 62 to 132mm of water when growing vegetables under the A2 scenario for 2071–2100 using HadRM3 and an assumed irrigation efficiency of 70 per cent⁸³.

Water shortage at household level, farmers are more dependent on reclaimed water due to water scarcity, however reclaimed water is becoming more expensive. Drought has also caused a decline in food and water available for livestock production. Financial burden on farmers, as reclaimed water is increasing in price. Farmers are forced to receive reclaimed water in times that they do not need for irrigation (e.g. during rainy season) and they cannot store it for long as its quality will deteriorate, resulting in serious health risks. Women pointed out that lack of knowledge around permaculture techniques and greywater use in addition to lack of funding to install rainwater harvesting systems. Less farm workers are needed and for less number of days. In addition, extreme weather in summer and winter has damaged crops and caused economic losses to farmers. Livelihoods of Syrian farmers are also negatively affected by these impacts.

Jerash: Flooding and drought are the two most significant climate change hazards in Jerash. Poor water purification system, results in farmers receiving poor quality water. Reclaimed water that does not meet minimum health and safety standards pollutes the soil and groundwater. Drought and the decrease in precipitation as a result of climate change has an adverse effect on Jerash that depend highly on agricultural and livestock production. Farms are in critical conditions, livestock, olive and olive oil production have decreased, causing loss of jobs, this results in financial burdens to farmers. The quality of reclaimed water is deteriorating and becoming more expensive, as a result farmers in Jerash suffer from poor water quality and quantity causing a decrease human and land productivity. Moreover, water ponds result in potent smells that may cause disease. Syrian DPs that work on farms are also negatively affected by these impacts.

For an overview of the main climate change issues and needs in target areas in Jordan see Table 2.

⁸³ <https://royalsocietypublishing.org/doi/pdf/10.1098/rsta.2010.0207>

Table 2: overview of main climate change issues and needs in target areas in Jordan

Community	Population	Main climate change impacts / Hazards (exposure)	Effects on communities and vulnerable groups (sensitivity)	Barriers to adapt (adaptive capacity)	Priority resilience building interventions	Main issues and concerns (identified through consultations) and response needs (to be aligned with work Amal)
MUNICIPALITY						
Qasabit Mafraq (Mafraq)	Total Number: 124,479 Syrian DPs: 39,359 Female: 59,542 Disabled: NA	Flooding Drought	Flooding Safety risk due to flooding especially for women and children Damage to infrastructure and houses Households Displacement Spread of diseases among children and youth Limit children and parents mobility Drought Water Scarcity in urban areas Add financial burden to families due to lack of adequate drinking water Agriculture/ crop failure with significant impact on Syrian DPs	Lack of funding Lack of capacity Lack of awareness about water scarcity and water conservation strategies. Absence of legislations to cope with climate change Lack of adequate water supply for household purposes Socio-Economic Data: Poverty: 11.7% Poverty (+Syrian % of total): 43.3% Water network coverage (# of subscribers/HHs): 67.4% % of HH not connected to the network: 32.6% Needed Water [M3]: 5,910 VI attributed to Jordanian: 68% VI attributed to Syrian refugees: 32% Water Vulnerability: Severe Vulnerability Number of Agricultural Holdings: 3,618 Area of Agricultural Holdings (Donum): 68,544	Greywater reuse system in schools and mosques Rooftop rainwater harvesting system at municipal building, schools and mosques Urban master plan at with CC and gender mainstreamed	Some cultural and religious resistance to greywater reuse (awareness through religious leaders) Service provision disparities Potential conflicts over the provided services due to land ownerships Wastewater polluting the soil. Having microorganisms in the treated water
Al-Ghadeer Al-Abiad (Mafraq)	Total Number: 1,661 Female: 814 Disabled: NA Syrian DPs: 271 <14: 680 15-24: 338 25-60: 658 >60: 76	Drought Extreme Weather (heat and cold)	Drought Less water available for agriculture Changing crop patterns Decline in livestock production Extreme heat and cold Crop failure	Lack of funding and high prices of reclaimed water Lack of capacity to use new agricultural techniques Absence of legislations to cope with climate change Socio-Economic Data: Poverty: x Poverty (+Syrian % of total) Agriculture: Water network coverage (# of subscribers/HHs): % of HH not connected to the network: Needed Water [M3] VI attributed to Jordanian VI attributed to Syrian refugees Water Vulnerability: Number of Agricultural Crop Holdings: Area of Agricultural Crop Holdings (Donum):	Enhance the quality of treated wastewater from Al Mafraq WWTP Reduced agricultural water losses through water efficient drip irrigation	Land availability as farmers prefer to use the whole land for cultivation. Non-equal access to provided service. Water shares are not evenly distributed among farmers (inclusive planning)

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Qasabit Irbid (Irbid)	Total Number: 739,212 Jordan Population: 573,369 Syrian DPs: 165,843 Female: 355,898 Disabled: NA	Flooding Drought	Flooding Safety risks especially for displaced, elderly women and children Displacement Damage to infrastructure and houses Increased diseases Drought Urban water scarcity Add a financial burden on families due to lack of adequate drinking water Agricultural decline with significant impact on Syrian DPs	Lack of funding Lack of awareness Lack of space in wadis to provide buffer zone in flooding Absence of legislations to cope with climate change Socio-Economic Data: Poverty: 9.9% Poverty [+Syrian % of total]: 32.3% Agriculture: Water network coverage (# of subscribers/HHs): 75.1% % of HH not connected to the network: 24.9% Needed Water [M3]: 38,688 VI attributed to Jordanian: 78% VI attributed to Syrian refugees: 22% Water Vulnerability: Severe Vulnerability Number of Agricultural Holdings: 7,879 Area of Agricultural Holdings (Donum): 55,433	Rooftop rainwater harvesting in municipal building, residential building, schools and mosques Greywater treatment and reuse in schools and mosques Urban master plan at with CC and gender mainstreamed	How to use apartment blocks for water harvesting
Bani Obead (Irbid)	Total Number: 204,313 Jordan Population: 155,739 Syrian DPs: 48,574 Female: 100,351 Disabled: NA	Drought Extreme heat Flooding	Drought Urban water scarcity Add a financial burden on families due to lack of adequate drinking water Personal Hygiene among children Decline in agricultural area Extreme heat Increased diseases Change of agricultural patterns Flooding Safety risks among displaced, elderly, women and children Damage to houses and infrastructure Affect mobility of women and children	Lack of funding Lack of awareness about water scarcity and water conservation strategies. Outdated water supply networks causing inadequate water supply for household purposes Absence of legislations to cope with climate change Socio-Economic Data: Poverty: 9.9% Poverty [+Syrian % of total]: 32.3% Agriculture: Water network coverage (# of subscribers/HHs): 75.1% % of HH not connected to the network: 24.9% Needed Water [M3]: 38,688 VI attributed to Jordanian: 78% VI attributed to Syrian refugees: 22% Water Vulnerability: Severe Vulnerability Number of Agricultural Holdings: 7,879 Area of Agricultural Holdings (Donum): 55,433 -	Rooftop rainwater harvesting Greywater treatment and reuse in schools and mosques	Lack of participation in planning of project/ interventions. Safety during construction. Service provision disparities Potential conflicts over the provided services due to land ownerships. Untreated groundwater leakage and water salinity.

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Ramtha (Irbid)	Total Number: 238,502 Jordan Population: 170,196 Syrian DPs: 68,306 Female: 114,571 Disabled: NA	Drought Extreme Weather (heat and cold)	Drought Less water available for agriculture with significant impact on Syrian DPs Urban water scarcity Decline livestock production Irrigation demand will increase from 62 to 132mm of water when growing vegetables under the A2 scenario for 2071–21 Extreme heat and cold Crop failure	Lack of funding for farmers to adapt Lack of awareness of and financial capacity to invest in permaculture Lack of capacity to use new agricultural techniques Socio-Economic Data: <u>Poverty:</u> 25.1% <u>Poverty [+Syrian % of total]:</u> 53.7% <u>Agriculture:</u> <u>Water network coverage (# of subscribers/HHs):</u> 35.8% <u>% of HH not connected to the network:</u> 64.2% <u>Needed Water [M3]:</u> 16,439 <u>VI attributed to Jordanian:</u> 71% <u>VI attributed to Syrian refugees:</u> 29% <u>Water Vulnerability:</u> High Vulnerability <u>Number of Agricultural Holdings:</u> 6,515 <u>Area of Agricultural Holdings (Donum):</u> 91,320	Permaculture at JUST Rainwater harvesting at schools Greywater treatment and reuse at schools	Increased water expenses Untreated groundwater leakage and water salinity
Jerash	Total Number: 207,97 Jordan Population: 197,704 Syrian DPs: 10,293 Female: 99,879 Disabled: NA	Drought Flooding	Drought Less water available for agriculture Decline in livestock production	Lack of funding and high prices of reclaimed water Lack of capacity to use new agricultural techniques Absence of legislations to cope with climate change Socio-Economic Data: <u>Poverty:</u> 20.3% <u>Poverty [+Syrian % of total]:</u> 25.2% <u>Agriculture:</u> <u>Water network coverage (# of subscribers/HHs):</u> 63.0% <u>% of HH not connected to the network:</u> 37.0% <u>Needed Water [M3]:</u> 7,809 <u>VI attributed to Jordanian:</u> 95% <u>VI attributed to Syrian refugees:</u> 5% <u>Water Vulnerability:</u> High Vulnerability <u>Number of Agricultural Holdings:</u> 8,398 <u>Area of Agricultural Holdings (Donum):</u> 98,099	Enhance the quality of treated wastewater from Al Maerad WWTP Reduced agricultural water losses through water efficient drip irrigation	Non-equal access to provided service. Water shares are not evenly distributed among farmers The lack of distribution of water pipes to farmers Wastewater polluting the soil. Not cleaning the canals between the station and the flood stream.

Based on UN-Habitat vulnerability assessment conducted in target area (through consultations). Details of surveys and consultation outcomes can be shared on request

Assessment of sensitivity showed that the average sensitivity level is 3.71. Adaptation strategies and measures suggested for the water sector in the TNC are:

- Rainwater harvesting.
- Wastewater treatment.
- Desalination.

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- Increasing Efficiency of irrigation technologies.
- Grey water Reuse.
- Public awareness.

5 out of the 7 adaptation measures advanced to water sector in Jordan are covered in this proposal.

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Project Objectives

The overall aim of this project is to better respond to climate change impacts and vulnerabilities in the context of the Syrian crisis in Jordan and Lebanon. This is done by demonstrating what concrete adaptation measures (see comp 3) respond to the needs of both DPs and host communities, and especially women and youth, while avoiding any tension over resources and employment opportunities.

The project will focus on responding to climate change-related water challenges by taking a sustainable water management approach. This means it aims to reduce the demand of unsustainable water sources such as **over-extracted** (and often polluted) groundwater, while increasing water supply options from non-conventional and more sustainable sources, incl. rainwater harvesting and the reuse of treated waste water (see comp 3).

The project will promote the replication and upscaling of the demonstrated techniques and approaches, also beyond Jordan and Lebanon (see comp 4), and to demonstrate how water resources can be assessed, planned and managed more efficiently at the municipal level (i.e. establish urban-rural linkages) and sustainably (by mainstreaming climate change and gender in municipal master plans) (see comp 1).

During project preparation, DPs in the target areas have been identified as the most vulnerable group due to their socio-economic situation and their dependence on often water-vulnerable sectors, especially the agriculture sector. However, to avoid supporting increased tension between DPs and host communities, the project also targets host community members. Assessment and planning processes under component 1 and capacity building activities under component 2 will target both DP and host community groups to avoid and even reduce any tension.

Table 3: project objectives and sub-objectives

Objectives	Development approach applicable to climate change and DPs crisis context
Overall objective: Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon.	
Sub-objectives:	
Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration	Support addressing regional DPs crisis and climate change challenges at the municipal level: through developing a comprehensive and integrated development response approach (see comp 4) Forward-looking / pro-active urban spatial planning and sustainable water management: planning for future urban (population) growth and climate change impacts in an integrated manner (see comp 1)
Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems	Citizen engagement: minimizing risks of social tensions through citizen engagement and enhancing opportunities for social exchange between host-city inhabitants and DPs (especially women and youth) (see comp 1 and 2) Awareness, capacity / skill building support: providing support such as skill building and training to build people's self-reliance, especially regarding water (targeting especially women and youth) (see comp 2)
Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context	Settlement upgrading: Area-based (i.e. urban – rural linkages) approach for increasing the resilience of water supply services (see comp 1) Assets, services and livelihood security projects: Expanding and strengthening water infrastructure and services which are climate change resilient and sustainable (and capture best practices) (see comp 3)
Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)	Improvement of knowledge, policies regulations in the region: by developing a 'regional' approach model for managing urban risks and vulnerabilities in the context of climate change and urban (population) growth (also because of high influx of DPs), especially for type 2 cities, including gender considerations + sharing lessons

*In line with World Bank et al (2017, policy note September 14): Refugees in the middle east. Bringing an urban lens to the forced displacement challenge.

Project Components and Financing

Table 4: project components and financing

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US\$)
1. Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration	1.1.1. Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries (in line with AF outcome 2)	1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan Above strategies and plans including mapped current and future water demand needs and supply options considering esp. climate change, urban growth and agriculture evolution + action / investment plans (incl. identified solutions) to use water most efficiently within municipal boundaries Above also includes workshops / trainings targeting esp. women and youth (both host communities and DPs) to develop the plans	Lebanon	249,000
			Lebanon	366,530,000
			Jordan	366,562,000
				T: 1,341,981,000
2. Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems	2.1.1. Strengthened DPs and host community awareness and ownership of CC adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures (in line with AF outcome 3 and 8)	2.1. Community organisation, awareness and capacity building + operation, maintenance and replication/ upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9 For more details see section II.A	Lebanon & Jordan	177,400,195,400
				139,200
				234,000
				316,300,163,200
3. Expand unconventional water harvesting and supply options, using innovative and replicable techniques	3.1.1. Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context and benefitting vulnerable groups (in line with AF outcome 4, 6 and 8)	3.1. Rooftop rainwater harvesting in Lebanon 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.4. Efficient treatment and reuse of wastewater, incl. through wetlands, in Lebanon 3.5. Efficient treatment and reuse of wastewater in Jordan 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration – closed loop water use-efficient system in Jordan 3.9 Permaculture Permaculture demonstration – closed loop water use-efficient system in Lebanon	Lebanon	867,262
			Jordan	820,820,836,820
			Jordan	843,112
			Lebanon	1,996,955,846,120
	Jordan	6,120		
	Lebanon	1,053,332		
	Jordan	1,278,300,988,950		
	Jordan	804,400		
	Lebanon	384,046		
		885,725		

		For more details see section II.A		T: 8,048,227.7 509,767
4. Project KM and replication, incl. dev. of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)	4.1.1. Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally (in line with AF outcome 3 and 8)	4.1. Regional / international KM with focus on sharing project lessons and replication 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Lebanon & Jordan (and other countries in the region that are part of ESCWA)	280,000 4373,800 14654,000 40,362 T: 923888,162
5. Total components				11,6550,598 9
6. Project/Programme Execution cost				1,223,21072
7. Total Project/Programme Cost				12,8783,809 64
8. Project/Programme Cycle Management Fee charged by the Implementing Entity				1,094,69927 8
Amount of Financing Requested				13,973,5086 8,139

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Projected Calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	OctoberJune 2020
Project/Programme Closing	AprilDecember 20254
Terminal Evaluation	JanuarySeptember 20254

Table 5: Project calendar

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project components

To achieve the overall project objective 'Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon' the projects' 'core' entails a set of 'concrete' adaptation actions, using innovative and replicable techniques that aim to reduce the demand of unsustainable water sources such as (polluted) groundwater, while increasing water supply options from non-conventional and more sustainable sources, such as rainwater harvesting and the reuse of treated waste water at municipal and community level (component 3). To ensure local ownership and capacity to 'manage' these 'concrete' adaptation actions and to avoid social tension of proposed project benefits, measures to inclusively plan, operate, maintain and replicate the actions are proposed at the community level (component 2). To better manage urban risks and vulnerabilities, especially related to the water sector, assessment and planning capacities will be strengthened at the municipal level (component 1). Based on above, a model to better manage urban risks and vulnerabilities suitable for a high DPs influx context area (in type 2 cities) will be developed, taking into account the impacts of climate change, especially on water resources. This model is relevant for the Mafraq region as well as areas with a similar context and will therefore be shared in the region (component 4). For detailed maps of target areas and conceptual drawings of concrete interventions, see annex 2. For details of all activities, see budget notes in annex 6.

The objectives of the proposal are in line with national priorities (see section II.D) and Adaptation Fund outcome areas, which resulted in the following components:

Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration (in line with AF outcome 1 and 2).

This component will focus on strengthening municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies and urban master plans + developing action / investment plans and guidelines (with identified solutions) to use especially water most efficiently within municipal boundaries. Thus, through this project, these strategies and plans and assessment conducted, including climate change vulnerability assessments, considering all climate-change-related hazards, but specifically water challenges and floods, will be used as tools to identify and manage climate change hazards, vulnerabilities and impacts, especially water related challenges, using various scenarios. Municipal officers will be trained to conduct climate change vulnerability assessments as integral part of developing these strategies and plans; thus, to manage related urban risks and vulnerabilities. ~~UNESCWA and Riccard RICCAR are in the process of developing climate change scenarios and vulnerability assessments at the local level, which will also support this process in Lebanon and Jordan.~~

Why is this needed: As tensions between DPs and host communities, especially around scarce resources and jobs, are increasing, inclusive community-level planning processes are needed to support social exchange and to ensure equal benefits to interventions. However, in both Jordan and Lebanon, there is ~~very~~ limited capacity at the municipal/ community level to respond to climate change and to manage water in an efficient, comprehensive and forward-looking way. One of the reasons is the lack of coordination between different authorities (i.e. municipalities, water establishments, ministry of agriculture) and disciplines (i.e urban planners, water engineers and agriculture engineers), which all produce their separate plans, making planning often not inclusive and efficient. Besides that, in both Jordan and Lebanon, ~~most of the~~ water management is the responsibility of national and governorate-level authorities. At this level, the focus is still very much on extracting water from conventional sources, especially groundwater, which is overexploited and increasingly polluted and current demand and supply focused, with limited consideration of climate change impacts and population growth and migration trends. However, municipalities are responsible for managing non-conventional water sources within their boundaries, including e.g. rain/storm-water, which opens up opportunities to plan and implement climate change adaptation options, such as rainwater harvesting, in an inclusive way.

Therefore, to respond to the issues of climate change and urban risks and vulnerabilities it is important to deal simultaneously with urbanization, climate change, especially water issues and agriculture in a forward-looking way. Municipalities need tools to do this, and the proposed assessments, strategies, plans and guidelines are just that.

For instance, the current Lebanon Bekaa Water Establishment water and wastewater masterplans are solely operational/sectoral plans that indicate the locations of the main supply and distribution of water and wastewater facilities. These plans lack any synergies with intersectoral issues that climate change has impact on. The proposed strategies and plans aim to address these gaps by integrating the needs of various sectors in one area-based approach. In Jordan, the current municipal master plan for Irbid was developed before the Syrian crisis and is outdated. In Mafrqa, no master plan exists. In Lebanon, the same is the case for the municipalities surrounding Zahleh.

The process of formulating strategies and plans will help the target municipalities to identify medium and long-term adaptation needs and to develop strategies to get these funded. ~~This is very timely as this project will build on initiatives that are giving municipalities the mandate and technical units to assess and manage climate change data and integrate this in municipal plans. These initiatives are the development of National Urban Policies in both Jordan and Lebanon (see section F), in which municipalities are urged to develop their local level plans and mainstream climate change in their planning processes as well as the set-up of Urban Observatories (supported by CVBD (see section F), which is a mechanism to manage urban data and inform decision-making to coordinate this at the national level, including for climate change data with a National Observatory.~~

Climate change data available: In both Jordan and Lebanon, climate change data is collected and managed through national observatories. Sources of data are a combination of national sources and international ones, including ESCWA / RICCAR, which will provide climate change at the local level in 2020. Besides that climate change data and vulnerability assessment data, also at the local scale has been provided through multiple plans, incl. e.g. TNCs. In both Jordan and Lebanon, the governments aim to have urban observatories to collect and manage urban data including climate change data (see also section F).

Climate change data missing: recurrent collection and management of climate change data in target municipalities, esp. Mafraq and municipalities surrounding Zahle.

What data will be collected, processed and analysed and by whom: available data for target municipalities and new climate scenario and vulnerability assessments with a focus on Urbanization dynamics, Agricultural dynamics, Water issues and Soil issues. The data will be analysed by the to-be-strengthened/built by this project Urban Observatory Division in the target Municipalities as part of their business as usual roles (day-to-day work). Staff of such to-be-strengthened/built by this project Urban Observatory Division will have their capacities strengthened/built by this project to be in charge of coordination mechanism between municipal level and national government level on data and planning. In Jordan, two urban observatories will be established and in Lebanon one, covering Zahle and surrounding municipalities.

With regard to the current status of such Urban Observatories, the project will resume previous efforts engaged in assessing the existing situation of the relevant organizational units at the three municipalities in terms of level of development and potential upgrading of what resembles the function of urban observatories⁸⁴. A number of organizational units at the targeted municipalities partially, but at different development levels, practice what fully developed observatories do globally, where they also collect data other than climate data. The aim is for the data to be used by planning authorities, infrastructure operators, emergency services and community groups to help them make better informed decisions about how conditions in the city could affect them. This will also inform planned concrete adaptation interventions in this project, especially related to specific vulnerabilities and detailed response designs. Below an overview of specific project activities / outputs under component 1 is provided:

Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems (in line with AF outcome 3)

This component will focus on strengthened DPs and host communities' awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building.

Why is this needed: To ensure sustainability of the proposed adaptation measures under component 3, communities need to 'own' the interventions and it needs to be clear how the proposed measures will be operated, maintained and replicated. Because there is a lack of capacities to do this at the community level, these capacities will be strengthened, as well as the awareness of adaptation options.

Above will be done by developing operation, maintenance and replication plans for proposed adaptation actions in a participatory way, including identifying responsibilities and maintenance budgets. Women and youth organization will be strengthened and trained to lead water harvesting interventions at home / in the settlement and to use and replicate techniques.

Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context (in line with AF outcome 4 and 6).

⁸⁴ According to the definition provided by UN Habitat II, an urban observatory is a local network, which brings together different partners in charge of collecting, processing and disseminating data on different municipalities. It consists of a certain number of indicators on issues of sustainable development. It uses information gathered by local actors in order to help deciding upon and constructing sound and strong-willed policies. Hence, the urban observatory represents a central element in urban control on both international and national level.

This component will focus on increasing the adaptive capacity within the water sector through resilient and sustainable water supply, using innovative, climate change resilient water supply techniques, which are suitable for high DP's influx context and replicable and mostly benefit vulnerable groups, also through securing water-dependent livelihoods, especially in the agriculture sector. The purpose is to reduce the demand of unsustainable water sources such as (polluted) groundwater, while increasing water supply options from non-conventional and more sustainable sources, such as rainwater harvesting and the reuse of treated wastewater.

Why is this needed This is needed because of increasing water availability challenges in both Jordan and Lebanon, exacerbated by climate change and the limited options municipal governments have to respond to these challenges.

The proposed concrete adaptation measures all aim to harvest available water from non-conventional sources (rain and wastewater) and to treat and irrigate it as efficiently as possible. The proposed interventions include rooftop rainwater harvesting systems and water saving devices, greywater treatment and reuse systems and water saving devices, efficient treatment and reuse of waste water, ~~incl. using wetlands~~, water-use-efficient irrigation of treated wastewater systems and permaculture demonstrations - closed loop water systems.

These proposed measures were prioritised by the project steering committees (with representatives from different ministries and the target municipalities) and beneficiary communities (through consultations).

Rooftop rainwater harvesting systems will be established in municipal buildings, schools and mosques and residential buildings in the target areas in Jordan and Lebanon. Municipal buildings were selected as demonstration / awareness raising sites, while schools and mosques were selected because of high impact and awareness raising purposes, including through curriculum and religious ~~leaders~~ leaders' speeches inputs (see linked component 2). Residential buildings were selected to test these systems in all possible buildings with the purpose to identify how the rainwater harvesting intervention can be scaled-up to a municipal or national programme. In Jordan, various ministries requested UN-Habitat (see section II.I) to set-up a national programme for rainwater harvesting. Techniques will be piloted in Irbid and Mafrq, while a possible incentive mechanism will be developed under output 4.4.

Besides that, grey water treatment and reuse systems will be established in schools and mosques in Jordan, also targeting religious leaders and children for awareness raising purposes (under linked component 2).

In both Jordan and Lebanon, the quality of wastewater will be improved and water storage capacity increased to safely and efficiently irrigate agricultural land. In the target areas, release of untreated waste water and non-efficient use of treated waste water (due to lack of storage capacity and ~~non-efficient~~ non-efficient irrigation techniques) has been identified as a major problem and priority (see section II.I). Besides that, permaculture demonstration sites will be established at Jordan University of Science and Technology (JUST) in Jordan and at the Lebanese Agricultural Research Institute (LARI) in Lebanon, targeting students and surrounding farmers to replicate the techniques.

Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DP's migration) (in line with AF outcome 7).

This component will focus on Strengthened (inter)National institutional capacity sharing and cross-fertilization to manage climate change and DP crisis related urban water scarcity challenges, including 1) lessons learned and good practices collected from the implementation of the project activities at the national and local levels and shared regionally; and 2) establishing a permanent regional knowledge management (community of practice) platform as part of the ACCCP and RICCAR knowledge hub to discuss, operationalize and scale-up the regional urban risks and vulnerabilities management model and sustain experience sharing and dissemination among the concerned countries and other 3RP countries within the region beyond the project; and 3) organizing regional workshops for experience sharing among the participating countries but also the 3RP countries in addition to participating in relevant global events

to advocate for the developed model beyond the region. Lessons learned, especially what worked and what did not, will be captured through monitoring of all project sub-interventions, also to identify what worked and what not. This would then feed into replication / upscaling guidelines, which will be developed for all sub-interventions (under component 2). All info will feed into output 4.3. the development of a Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities. Field visits will also show what worked and what will not. As mentioned above, all collected information will be shared at the municipality, national level and international level, through workshops and conferences, but also by using ~~a~~[knowledgea knowledge](#) sharing platform.

Why is this needed: as mentioned above, there is a need for more effective, inclusive and sustainable programming focused on addressing water challenges, especially in 'host' (type 2) cities, exacerbated by both the influx of DPs and climate change impacts. There is an opportunity to share lessons between Lebanon and Jordan, but also in the region through the UN-ESCWA established Arab Centre for Climate Change Policies (ACCCP) and KM platform and to have the project outcomes and outputs feed into 3RP (i.e. Regional, Refugee and Resilience Plan) programming under the WASH sector (see annex 1) [and replicated in cities facing similar challenges which sustains the knowledge generated by the project.](#)

Overview proposed project activities

Table 6: Jordan and Lebanon proposed project activities details and feasibility assessment outcomes.

For detailed maps of target areas and conceptual drawings of concrete interventions, see annex 2.

Problem description and climate change adaptation needs statement	Adaptation measure outcome (to address the problem and needs)	Detailed outputs / activities	Target areas	Suitability	Beneficiaries (Total, Women, Youth, Syrians – T, W, Y and S used below)		Budget (USD)	Executing entity	Effectiveness in terms of adaptation / water saving and or collection
					Direct	Indirect			
Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration									
Lack of municipal institutional and technical capacity to manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, including from DPs migration Lack of forward-looking planning, incl. capacity and tools at municipal level	Strengthen municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries	Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon), including: project target areas climate change vulnerability profile, considering all climate change hazards	Zahle District	Target municipalities experience water challenges and have largest numbers of DPs in the country	Direct involvement T: 480 W: 40 % Y: 15 %	District: T: 429,824 W: 217,475 Y: 23,733 S: 243,465	249,000	Consultancy firm	By planning and managing water in a forward-looking and holistically way, water will be managed much more efficiently and overall demand reduced
		Urban master plans at municipal level with climate change and gender mainstreamed (Lebanon), including: project target areas climate change vulnerability profile, considering all climate change hazards <u>and urban observatory</u>	Hazerta Bar Elias El Marj Saadnayel Taanayel Taalabaya Terbol Ferzol	Proposed activities are aligned with national and municipal priorities, incl. municipal development plans Spatial strategies and urban master plans and action / investment plans / feasibility studies are suitable tools to plan water within municipal boundaries	Direct involvement T: 240 W: 40 % Y: 15 %	Municipalities: T: 167,631 W: 84,815 Y: 9,256 S: 94,951	530366,000	Consultancy firm + RTQ	
		Urban master plans at municipal level with climate change and gender mainstreamed (Jordan), including: project target areas climate change vulnerability profile, considering all climate change hazards <u>and urban observatory</u>	Mafrq Irbid		Direct involvement T: 450 W: 45% Y: 10 %	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	562366,000	Consultancy firm + Municipality s	
Total					930		1,341,000 00984,000		
Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems									
Lack of citizen awareness of climate change, esp. water scarcity challenges and capacities to respond to these challenges locally	Strengthened DPs and host communities awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate	2.1. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rainwater Harvesting in Lebanon	Zahle Ablah Hazerta, Saadnayel Bar Elias El-Marj	Citizens have limited awareness of water scarcity challenges, especially climate change-related	Direct involvement T: 55,000 W: 27,689 Y: 2,950 S: 29,300	Municipalities: T: 300,877 W: 154,582 Y: 16,548 S: 170,296	19577,400	UNICEF LARI/Comp any (in line with output 3.1.)	Increased acceptance efficient water use, supply and irrigation techniques
		2.2. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1:	Mafrq: Qasabit Mafrq Irbid: Qasabit Irbid	Capacities to operate, manage and replicate relevant techniques are limited, esp. related to water harvesting,	Direct involvement T: 52,855 W: 26,420 Y: 19,385 S: 8,728	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	139,200	JOHUD (in line with output 3.2.)	Increased capacity to operate, maintain and

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	proposed adaptation measures, including skills building	Rooftop Rainwater Harvesting in Jordan	Bani Obeid Ramtha	efficient irrigation and permaculture Large numbers of citizens can be reached through curricula, imams, demonstration sites, also in municipal government buildings					replicate techniques, including monitoring
		2.3. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.3: Grey Water Treatment and Reuse in Jordan	Mafrq: Qasabit Mafrq Irbid: Qasabit Irbid Bani Obeid Ramtha		Direct involvement T: 39,582 W: 21,940 Y: 15,646 S: 6,827	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	234,000	UNICEF (in line with output 3.3.)	
		2.4. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon	Zahle		Direct involvement T: 816 W: 416 Y: 85 S: 766	Municipalities: T: 184,332 W: 94,705 Y: 10,140 S: 104,332	163,200	RTO LARI (in line with output 3.4.4)	
		2.5. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan	Jerash (Ketteh) Mafrq (Al-Ghadeer Al-Abyad and Al-Akaider)		Direct involvement T: 35 W: 5 Y: 2 S: 0	Municipalities: T: 11,229 W: 5,342 Y: 2,972 S: 727	16,000	MoWI / YARMOUK WATER COMPANY (in line with output 3.5.)	
		2.6. Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6: Water-use-efficient irrigation of treated wastewater for fruit trees and vineyards and potato plantation in Lebanon	Zahle, Bar Elias		Direct involvement T: 4,495 W: 2,293 Y: 540 S: 2,525 F: Leb: 394- Syr: 595 T: 1,682 W: 864 Y: 93 S: 952	Municipalities: T: 184,332 W: 94,705 Y: 10,140 S: 104,332	142,100	RTO/Company LARI/Company (in line with output 3.6.4)	
		2.7.1Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use Efficient irrigation of treated wastewater from Maerad and Al Akaider WWTPs in Jordan	Jerash (Ketteh) Mafrq (Al-Akaider)		Direct involvement T: 450 W: 200 Y: 150 S: 150	Municipalities: T: 9,568 W: 4,528 Y: 2,474 S: 561	144,800	JOHUD (in line with output 3.7.1)	
		2.7.2.Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use Efficient irrigation of treated wastewater from Mafrq WWTP in Jordan	Mafrq (Al-Ghadeer Al-Abyad)		Direct involvement T: 300 W: 120 Y: 180 S: 100	Municipalities: T: 1,661 W: 814 Y: 498 S: 166	114,200	BADIA (in line with output 3.7.2)	
		2.8. Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation	Irbid (Ramtha)		Direct involvement / targeted T: 300 W: 150	Municipalities: Students: 23,000 W: 11,500	314,600	PRI (in line with output 3.8)	

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		output 32.8: permaculture demonstration			Y: 45 S: 30	Farmer family: 400 W: 200 Y: 60 S: 40			
		2.9.Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.9; permaculture demonstration in Lebanon	LARI Premises (located in Tal Amara) and Zahle Municipality; All Municipalities/ communities that fall within the Zahle District.		T (Students) 270 (in 3 years) W: 135 T (Farmers): 340 W: 70 Y: 90 Syr: 70	T (Farmers families): 4593,400 T (Surrounding municipalities / community): 8 W: 76700 Y: 60500 Syr: 48480	418,170	LARI (in line with output 3.9) and in coordination with Ministry of Education + Lebanese University)	
Total					T: 10143,588860 W: >40 % Y: >15 %		1.881.6 704,733 -299		
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context									
Lack of water availability in target areas, which will worsen with climate change:	Increased adaptive capacity within the water sector through resilient water harvesting options	3.1. Rooftop rainwater harvesting in Lebanon 20 systems (large) 11 Educational facilities 7 Religious buildings 1 Health facility 1 Municipal building (show room in building with RWH system, GWTR system and WSDs)	Zahle Ablah Hazerta Saadnayel Bar Elias El-Marj	Target municipalities experience water challenges and have largest numbers of DPs in the country Aligned with national and municipal priorities, incl. municipal development plans	Direct involvement T: 55,000 W: 27,689 Y: 2,950 S: 29,300	Municipalities: T: 300,877 W: 154,582 Y: 16,548 S: 170,296	867,262	UNICEF	1,410 m3
Lack of using rainwater efficiently and lack of showcases to build on to set-up a municipal or national rainwater harvesting programme	Water to be used for toilets, gardening, etc., not drinking Showcasing water harvesting options in different buildings	3.2. Rooftop rainwater harvesting in Jordan 86 systems: 49 schools (of which 18 rehabilitation) 15 mosques 20 residential buildings 2 municipal buildings with RWH system	Irbid (Qasabit Irbid, Bani Obeid, Ramtha) Mafraq (Qasabit Mafraq)	Municipalities are mandated to manage water within municipal boundaries, which includes rainwater harvesting options Schools and mosques are targeted because of large water harvesting potential + awareness raising potential (see comp)	Direct involvement T: 52,855 W: 26,420 Y: 19,385 S: 8,728	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	83620,8 20	JOHUD	Av school saving (Irbid):528m3 Av saving for 40 schools (Irbid): 21,120m3 Av school saving (Mafraq):101m3 Av saving 9 schools (Mafraq): 909m3 Total: 22,029m3
Lack of water availability in target areas, which will worsen with climate change:	Increased adaptive capacity within the water sector through resilient water treatment and reuse options in buildings	3.3.Greywater treatment and reuse in Jordan 40 systems: 35 schools 5 mosques	Irbid (Qasabit Irbid, Bani Obeid, Ramtha)		Direct involvement Schools: T: 39,582 W: 21,940 S: 6827	Municipalities: T: 863,691 W: 415,440 Y: 259,107 S: 205,202	843,112	UNICEF	Potential Monthly Water Quantity Treated and Reused (m3): 4,369 m3

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Lack of using grey water efficiently	Water to be used for toilets, gardening, etc., not drinking		Mafrq (Qasabit Mafrq)						
Lack of water availability in target areas, which will worsen with climate change: Lack of re-using treated wastewater efficiently due to: Lack of quality Lack of storage capacity	Increased adaptive capacity within the water sector through resilient water treatment and reuse options - efficient use of treated wastewater systems through improved quality of treated wastewater + storage capacity for efficient irrigation purposes	3.4. Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon Diverting the plant's treated effluent for irrigation purposes.	Zahle (Cadastres: Zahle Aradi, Zahle Haouch El-Oumara Aradi, Zahle Haouch EL-Oumara, Zahle Maallaqa Aradi)	Target municipalities experience water challenges and have largest numbers of DPs in the country Aligned with national and municipal priorities, incl. municipal development plans	From WWTP T: 3,917 Women 2013 Youth 216 Syrians 2217	Municipalities: T: 184,332 W: 94,705 Y: 10,140 S: 104,332	846,120	RTO/Compagny	18,000 m3 treated daily for 110 6 Hectares of agricultural lands
		3.5.1 Efficient treatment and reuse of wastewater in Jordan Improving water quality and storage capacity for irrigation use from Maerad WWTP	Jerash (Ketteh)	Farmers are facing water scarcity challenges because the WWTPs do not produce and store enough clean water; waiting list for farmers exist to get access to WWTP water (through contract)	T: 77 W: 31 Y: 20 S: 15 Farms: 25	Municipalities: T: 7,919 W: 3,789 Y: 1,980 S: 396	1,053,324 26,357 496,400 130,675	MoWI / YARMOUK WATER COMPANY	Water Storage: 3,000m3
		3.5.2 Efficient treatment and reuse of wastewater in Jordan Improving water quality and storage capacity for irrigation use from Al Akaider WWTP	Mafrq (Al-Akaider)	Zahle WWTP releases treated water into Litani River which does not directly benefit the area's farmers.	T: 78 W: 31 Y: 20 S: 15 Farms: 32	Municipalities: T: 1,649 W: 739 Y: 494 S: 165		MoWI / YARMOUK WATER COMPANY	Water Storage: 2,000m3
		3.5.3 Efficient treatment and reuse of wastewater in Jordan Improving water quality for irrigation use from Mafrq WWTP	Mafrq (Al-Ghadeer AL-Abyad)	Farmers use polluted water from rivers for crop irrigation. Treated water from WWTP in Jordan is lost during the night because of lack storage capacity and water already used by farmers lacks quality	T: 120 W: 35 Y: 20 S: 25 Farms: 40	T: 1,661 W: 814 Y: 498 S: 166		MoWI / YARMOUK WATER COMPANY	Irrigated dunums: 100
Lack of water availability in target areas, which will worsen with climate change:	Increased adaptive capacity within the water sector through water efficient irrigation options – Efficient irrigation of treated wastewater	3.6.4 Water-use-efficient irrigation of treated wastewater for fruit trees and vineyards in Lebanon from Zahle WWTP, Lebanon Replace surface irrigation for fruits trees, <u>and</u> vineyards <u>and</u> <u>potato plantation</u> with drip systems (pumps, filters, sensors, automated tools)	Zahle, <u>Bar Elias</u>	Target municipalities experience water challenges and have largest numbers of DPs in the country	T: 4,495 W: 2,293 Y: 540 S: 2,525 F: Leb: 394; Syr: 505	Municipalities: T: 253,456 W: 130,219 Y: 13,941 S: 143,456	928 988,950	RTO/Compagny	150,149 150 Hectares of agricultural

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Lack of using water efficiently in agriculture practices	to farmland with accepted irrigation technology			Aligned with national and municipal priorities, incl. municipal development plans; in Jordan, sprinklers are forbidden by law but still often used.					
		2.7.4 3.7.1 Water-use Efficient irrigation of treated wastewater from Maerad and Al Akaider WWTPs in Jordan. Modern irrigation system	Jerash (Ketteh) Mafrq (Akaider)	Farmers are facing water scarcity challenges but often don't use efficient water use irrigation systems	T: 155 W: 62 Y: 40 S: 30 Farms: 40	Municipalities: T: 9568 W: 4528 Y: 2474 S: 561	804,400 406,400 398,000	JOHUD	120 donums
		3.7.2 Water-use Efficient irrigation of treated wastewater from Mafrq WWTP, Jordan. Modern irrigation system	Mafrq		T: 120 W: 35 Y: 20 S: 25 Farms: 40	T: 1,661 W: 814 Y: 498 S: 166		BADIA	100 donums
Lack of water availability in target areas, which will worsen with climate change:	Permaculture demonstration site showing efficient water use system for student and farmers; This includes organic production examples that increase the quality and the quantity of soil (creating a bio-sponge) while producing nutrition-dense food. This system reduces water needs	3.8 permaculture demonstration – efficient water use system Bio-Fertilizer production; Crop Garden and Compost Egg laying Chickens; Bees / apiculture; Compost worms; Olive Orchard Monoculture Conversion to Food Forest	Jordan University of Science and Technology campus Irbid (Ramtha)	Target areas experience water challenges and have the largest numbers of DPs in the country; Farmers are facing water scarcity challenges but often don't use water efficiently; The area experiences unsustainable land use / agriculture practices that resulted in degradation of ecosystems leading to reduced services and food security issues	T: 300 W: 150 Y: 45 S: 30 Students: 200	Students: 23,000 W: 11,500 Farmer family: 400 W: 200 Y: 60 S: 40 Community: 2,000 W: 1,000 Y: 300 S: 200	384,046	Permaculture Research Institute in cooperation with Jordan University of Science and Technology (JUST)	Water is saved by increasing the quality and the quantity of soil, creating a bio-sponge.
Lack of using water and other resources Incl. waste) efficiently in agriculture production systems		3.9. permaculture demonstration – efficient water use system Agricultural Waste Management for Sustainable Crop Production Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures Apiculture and the reduction of chemical substance use at farm level Introducing adapted crop varieties and diversifying farm production	LARI Premises (located in Tal Amara) and Zahle Municipality; All Municipalities/ communities that fall within the Zahle District.		T (Students) 270 (in 3 years) W: 135 T (Farmers): 340 W: 70 Y: 90	T (Farmers families): 3,400 T (Surrounding municipalities / community): 8 municipalities W: 700 Y: 500 S: 480	885,725	LARI + involved Municipalities	
Total					T: 157,309 19,424 (much overlap with comp 2) W:>40 % Y:>15 %		7,509.7 678,048 227		

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Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)									
Lack of (inter)national institutional and technical capacity to manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, including from DPs migration	Strengthened (inter)National institutional capacity to manage urban climate change and DP crisis related water scarcity challenges, including lessons learned collected and shared regionally; Through these activities knowledge between Jordan and Lebanon and the larger MENA / Arab region will be shared + some global exposure	Regional / international KM with focus on sharing project lessons and replication	MENA + Arab region and global	The MENA region is the most water scarce region in the world combined with the highest share of DP urban population	T: 200 W:>40 % Y: >15 %	Total MENA region	2780,000	UN ESCWA	By planning and managing water in a forward-looking and holistically way, water will be managed much more efficiently and overall demand reduced
		Jordan and Lebanon KM with focus on project progress, best practices and lessons learned	Jordan & Lebanon		T: 200 W:>40 % Y: >15 %	All target ministerial and municipal staff	4337,800		
		Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Target municipalities	Climate change action considering DPs crisis impacts, esp. in urban areas, is very limited	T: 200 W:>40 % Y: >15 %	All target municipal staff	16544,000	Consultancy firm	
		Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Jordan and possibly Lebanon		T: 200 W:>40 % Y: >15 %	All target municipal staff	40,000362	Consultancy firm	
Total					T: 600 W:>40 % Y:>15 %	923888,162			
Grand total					T: 120,951 W:>40 % Y:>15 %	11,6550,5989			

B. Promotion of innovative solutions

Component 1: The proposed Territorial planning and development strategy and urban master plans at municipal level [and urban observatories](#) aim to enable district and municipal governments to manage climate change and DP crisis related urban water scarcity challenges (and other impacts of climate change hazards, within their borders through a participatory approach. This approach will allow for more coordinated and forward-looking investment in infrastructure and services, which is currently lacking in the target areas and at the municipal level. The approach is not only unique for the target countries and target municipalities, but also for the region, as the assessment and planning approach responds to both climate change and DP crisis issues and aim to reduce tension over scarce resources. Therefore, the replication of this model will be promoted (through outputs 4.1, 4.2 and 4.3).

Component 2: The proposed measures aim to ensure sustainability (maintenance and replication) of the proposed concrete adaptation measures under component 3. Although this is not innovative, using community-level adaptation related planning and decision-making (also under component 1) as a tool to enhance social cohesion (i.e. avoid tension over scarce resources) is unique and very relevant and timely in the case of Lebanon and Jordan, where increased tension between DPs and host communities has been reported. Especially women and youth groups will be encouraged to participate in the exchange and planning process.

Component 3: The project proposes to use innovative internationally proven technologies to increase water availability from non-conventional sources and using it efficiently, while in that way reducing water demand from conventional sources such as (often polluted) groundwater. The purpose is the showcase intervention / techniques that are suitable for urban areas, considering urban-rural linkages, and that can also be used elsewhere in [the Jordan, and Lebanon](#) and in the region. Although some rainwater harvesting initiatives exist in Jordan and Lebanon, showcasing these in various types of buildings, including costs and benefits and replication options, will be a step to upscale such 'lose' initiatives towards municipal and even national rainwater harvesting programmes (see output 4.4), which has been pointed out as a priority in Jordan. Wastewater treatment and its use in agriculture is practiced in Jordan, but the water quality of often not good enough and storage capacity is lacking. In Lebanon, treating wastewater to a quality that it can be used in agriculture is not common practice and to showcase best practices, including standards, in both Jordan and Lebanon can be examples for both countries (which exchange to learn from both approaches (under output 4.2) and the larger region (under output 4.1.)).~~The same accounts for the proposed wetland in Lebanon, which cleans river water, and was prioritised by the Lebanese government to be fully tested.~~ While drip-irrigation exists in both Jordan and Lebanon, sprinklers are still often used. Therefore, a transfer to more water-use efficient irrigation technology is needed. The innovative permaculture concept has shown to be promising in Jordan through the national AF project and will be promoted through [studentsstudent](#) (to be involved with surrounding farmers and communities) and in the region (output 4.1) and in Lebanon (through output 4.2).

Component 4, The assessment and planning approach under component 1 is not only unique for the target countries and target municipalities, but also for the region, as it responds to both climate change and DP crisis issues and aim to reduce tension over scarce resources. ~~Therefore~~[Therefore](#), the model will be further developed under output 4.3, including best practices (and standards) of proposed concrete adaptation measures and replication of this model will be promoted through outputs 4.1, 4.2 and 4.3. Under output 4.4. mechanisms to upscale rainwater harvesting initiatives towards municipal and even national rainwater harvesting programmes will be identified, which would be a great step towards a national water saving impact.

C. Economic, social and environmental benefits

The proposed project aims to maximize benefits to the most vulnerable groups, including DPs, poor Lebanese and Jordanians, women and youth, and to avoid any negative environmental and social impacts.

Table 7: Project Economic, Social and Environmental benefits

Type of benefit	Baseline	With/after project
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Economic	Climate change is already leading to economic and livelihood losses, especially caused by less rain, droughts and water evaporation. Water dependent livelihoods, especially in the agriculture sector, are especially threatened; A large share of DPs, poor Lebanese and women are dependent on the agriculture sector for their income	<p>The governments, at different levels, but especially at the municipal level, will be able to better assess, plan and manage scarce water resources <u>also considering climate change impacts and vulnerabilities</u>, which are also of economic importance</p> <p>Through rainwater harvesting and grey water treatment and reuse interventions, water losses will be reduced / water saved, which will also save costs.</p> <p>Through the treatment and reuse of wastewater interventions, water losses will be reduced / water saved, which will also save costs, both for the Water Authorities of Jordan (esp Yarmouk, which has very limited resources), but also for the farmers, as water will be provided against reasonable costs. Without this intervention, farmland may be lost, which is also a treat to food security.</p> <p>The agriculture sector in target areas will be more climate change / drought resilient, leading to improved livelihood security, benefitting especially DPs, poor Lebanese and Jordanians, women and youth, with more secure / higher income.</p> <p>The permaculture intervention is to show student and farmers that through this approach water and resources can be used efficiently, making it a replicable business case. It will also <u>increased/increase</u> crop diversity and productivity;</p>
Social	Climate change is already leading to negative social impacts, especially caused by less rain, droughts and water evaporation, leading to rural–urban migration, and social tension and incoherent development.	<p>The governments, at different levels, but especially at the municipal level will be able to better assess, plan and manage scarce water resources <u>also considering climate change impacts and vulnerabilities</u>, also with the purpose to enhance social cohesion (i.e. avoid / reduce tension) over scarce water resources.</p> <p>Inclusive assessment, planning and decision-making processes over scare water resources, also involving DPs, poor Lebanese and Jordanians, women and youth, will enhance social cohesion (i.e. avoid / reduce tension) over scare water resources. Climate change resilient techniques skills building activities, including to operate, sustain and replicate these (especially targeting women and youth) + resilient water supply and irrigation systems, will benefit the most vulnerable, including DPs, poor Lebanese and Jordanians, women and youth.</p> <p>Water resources and water dependent livelihoods (i.e. agriculture) will be protected from pollution and through waste water treatment. This will reduce health issues, of whom the most vulnerable / poor groups suffer the most. Currently, water-related health issues are very high in the Bekkaa area compared to other areas. Harvesting systems and grey water reuse in public buildings, especially schools, will raise awareness for sustainable water use and climate change for students and through religious leaders</p> <p>'Peacebuilding' through involving youth and thus reducing possible tension between host and DP communities that is most likely to occur among youth.</p>
Environmental	Climate change is already leading to negative environmental impacts, especially land / soil degradation and desertification and overexploitation of resources. Moreover, due to the crisis, untreated wastewater is increasingly polluting water resources	<p>The government, at different levels, will be able to better assess, plan and manage scarce water resources <u>also considering climate change impacts and vulnerabilities</u>. Water resources and water dependent livelihoods (i.e. agriculture) will be protected from pollution and through waste water treatment. This will reduce health issues, of whom the most vulnerable / poor groups suffer the most. Currently, water-related health issues are very high in the Bekkaa area compared to other areas; Waste water treatment and reuse facilities to irrigate agriculture land and efficient water use options and permaculture will reduce groundwater and agriculture pollution while enhancing sustainable access to water, thus also securing agriculture livelihoods.</p> <p>Rooftop rainwater harvesting increases water availability at building and residential household level, and reduces urban flash flooding probabilities and reduces illegal connection to wastewater network thus reducing manhole flooding in the streets in winter season. Introduction of unconventional water sources will help decrease pressure on the already depleting groundwater resources in some areas.</p> <p>Permaculture: water needs reduced; pesticides and related soil/water pollution reduced; overall land / soil degradation reduced.</p>

The number of direct beneficiaries is estimated at 930 for component 1, 101,588-143,860 for component 2, 157,309-149,421 for component 3 and 600 for component 4 (see table 6). Approximately one fourth of the target population is Syrian. Targets for women and youth are set at 40 percent for women and 15 percent for youth. Because there is some overlap with beneficiaries between component 2 and 3, the total number of project direct beneficiaries is estimated at around 120,000. However, with a large share of the project activities focus on replication and knowledge sharing, the number of indirect beneficiaries is

expected to be very large. Moreover, indirect positive impacts of increased water availability and quality and livelihood sustainability is expected to have benefits for whole communities.

D. Cost-effectiveness

Table 8: Proposed adaptation actions' cost-effectiveness rationale

Proposed adaptation actions / outputs	Rationale why priority actions have been selected from a cost-effectiveness perspective and alternative actions considered
<p>1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon</p> <p>1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon</p> <p>1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan</p>	<p>A total of over 1 million people in the project target areas (inhabitants of the target municipalities) will benefit from municipal level master plans. This is little over USD 1 per inhabitant. (all together budget at a little less than USD 1 million). Project activities include assessments, including climate change vulnerability assessments, identification of response options and prioritisation of these, including feasibility assessments. Activities also include building the capacity of municipal staff (see part III.E).</p> <p>Municipal master plans <u>with climate change mainstreamed into it</u> are a cost-effective ways to assess, plan and manage municipal assets and infrastructure, including water resources <u>(esp non-conventional sources such as rain/stormwater), also looking at future needs. efficiently and comprehensively.</u> The benefit for municipal governments is that it allows them to manage the whole water system within and between municipal boundaries, in a more integrated and efficient way. Future trends and projections of climate change and DPs movement will be in integral part of the assessment and planning process (including for implementation of concrete adaptation actions such as below). These strategies will reduce water use costs because of more efficient use within the system and avoid costs associated with future climate change related water scarcity issues. However, these strategies and plans should be seen as a package to better plan for concrete adaptation actions in the future, and thus also sustain these.</p> <p>Alternatively, <u>in a no action scenario, municipalities will continue prioritizing actions that are not climate change resilient and sustainable or don't address the source issues. Moreover, without the municipal plans, water is only managed conventionally at the governorate / national level, mostly looking at current need and supply from groundwater, which is not sustainable and doesn't allow for using non-conventional water sources such as rain/stormwater efficiently within municipal boundaries. Thus, the municipal plans will complement the national water master plans. Through the National Urban Policy and climate change data coordination mechanism between the national and municipal level (i.e. observatories) the plans will effectively complement and guide national plans.</u> Integrated Water Resource Management is an <u>alternative</u> approach to comprehensively plan and manage water within a system, but this is not a ministry priority. <u>Currently, conventional water resources outside of municipal boundaries are managed at higher levels (ministry) with a focus only on current demand and supply.</u></p>
<p>2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1</p> <p>2.2. See above for output 3.2.</p> <p>2.3. See above for output 3.3.</p> <p>2.4. See above for output 3.4.</p> <p>2.5. See above for output 3.5.</p> <p>2.6. See above for output 3.6.</p> <p>2.7. See above for output 3.7.</p> <p>2.8. See above for output 3.8</p> <p>2.9. See above for output 3.9</p>	<p>Participatory planning processes are required to ensure ownership over to be implemented concrete adaptation measures. Participatory processes to operate, maintain and replicate interventions is required to sustain them. Moreover, some monitoring activities are needed to measures to effectiveness and sustainability of proposed concrete measures</p> <p>Alternatively, interventions are planned and executed top-down, but this may lead to lack of ownership and capacity to operate, maintain and replicate proposed concrete measures, which would result in a loss of investment</p>
<p>3.1. Rooftop rainwater harvesting in Lebanon</p> <p>3.2. Rooftop rainwater harvesting in Jordan</p> <p>3.3. Greywater treatment and reuse in Jordan</p>	See details in tables 8a and 8b below

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<p>3.4. Efficient treatment and reuse of wastewater, incl. through wetlands, in Lebanon</p> <p>3.5. Efficient treatment and reuse of wastewater in Jordan</p> <p>3.6. Water-use efficient irrigation of treated wastewater in Lebanon</p> <p>3.7. Water-use Efficient irrigation of treated wastewater in Jordan</p> <p>3.8. Permaculture demonstration – closed-loop water system in JordanLebanonSee outputs for concrete adaptation interventions below.</p>	
<p>4.1. Regional / international KM with focus on sharing project lessons and replication</p> <p>4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned</p> <p>4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities</p> <p>4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities</p>	<p>Regional project steering committee meetings (output 4.2) are organised, where possible, in conjunction with relevant regional events (output 4.1), thus avoiding double costs for travel and allowances. Relevant project lessons will be shared regionally and even globally through an existing relevant KM platform (output 4.1),and outreach mechanism, thus avoiding cost for this. Replicating the model developed under output 4.3. (through outputs 4.1 and 4.2) may result in adoption of the model elsewhere and in that way increase efficient use of water, also looking at the future, and in that way, avoiding related cost of non-adoption.</p> <p>Alternatively, best practices and approaches are not shared regionally, which may lead to loss of investments in countries and urban areas, which need to deal with similar situations.</p>

Table 8a: Jordan proposed concrete adaptation actions' cost-effectiveness rationale under component 3

Adaptation measure	Total project cost	Beneficiaries		Cost-effectiveness (Total Cost/ Beneficiaries)		Alternative Solutions	Justification
		Direct	Indirect	Direct (USD/ Beneficiary)	Indirect (USD/ Beneficiary)		
<p>3.2. Install and connect 86 Rooftop rainwater harvesting systems (of which 18 rehabilitation) in 2 municipal buildings, 20 residential buildings, 49 schools and 15 mosques.</p> <p>3.2. Install and connect 86 Rooftop rainwater harvesting systems (of which 18 rehabilitation) in 2 municipal buildings, 20 residential buildings, 49 schools and 15 mosques.</p>	83620,820	T: 52,855 W: 26,420 Y: 49,385 S: 8,728	T: 863,691 W: 445,440 Y: 259,407 S: 205,202	15.5	-10.95	<p>Alternative 1: Boreholes/Tubewells (groundwater abstraction). Total cost: 1,290,000USD⁸⁵</p> <p>Cost per beneficiary: Direct: 32.6USD Indirect: 4.6USD</p> <p>Alternative 2: Rainwater Collection from Ground Surface. Total cost: Approx. 9824,000*USD⁸⁶ Cost per beneficiary: Direct: 17.4 USD Indirect: 1.07USD* Excluding show room (2) with RWH system, GWTR system and Water Saving Devices (WSD), costed at (100,000USD).</p>	<p>1. The over-abstraction from the aquifers deteriorates the groundwater quality, increasing its salinity and deepening the static and dynamic water levels.</p> <p>2. It is assumed that the additional cost implication for over-pumping is equivalent to the cost of desalination, which is estimated at 2.12USD /m3 (this figure is used for both, camps and host communities). Therefore, the environmental cost is estimated at 99 USD/person.</p> <p>3. Rainwater collection from ground surfaces requires constant surface rehabilitation.</p> <p>4. Excavations and use of water cisterns will be limited to sites where the available space is limited and a mounting rectangular tank can't be used, to make sure the intervention is as cost effective as possible.</p> <p>5. According to the Climate Change Policy for a Resilient Water Sector published by the MoWI, RWH is among the prioritized solutions, as it scores highly in regards to cost efficiency and synergy between adaptation and mitigation.</p> <p>6. According to an article by former Minister of Water Eng. Hazem Naser⁸⁷, a 150-square-metre house in areas with average annual rainfall of 350 millimeters (mm) can collect at least 50 cubic meters of pure water annually by channeling rainwater to cisterns. And that installing a water harvesting system can reduce household water bills up to 40% annually.</p> <p>A study by Assayad showed that, rainwater harvesting can save 70-340 USD annually due to alleviating the need for purchasing private water tanks.</p> <p>Rainwater collection from ground surfaces requires constant surface rehabilitation and below ground tanks (i.e. cisterns) which require excavations.</p> <p>The over-abstraction from the aquifers deteriorates the groundwater quality, increasing its salinity and deepening the static and dynamic water levels.</p> <p>It is assumed that the additional cost implication for over-pumping is equivalent to the cost of desalination.</p>

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⁸⁵ https://backend.orbit.dtu.dk/ws/portalfiles/portal/7689720/TNA_Guidebook_AdaptationWater.pdf

⁸⁶ Intermittent water supplies: challenges and opportunities for residential water users in Jordan: David E. Rosenherg, Samer Talozl and Jay R. Lund

⁸⁷ <https://jordantimes.com/news/local/public-urged-harvest-rainwater>

							<p>which is estimated at 2.12USD /m3 (this figure is used for both, camps and host communities). Therefore, the environmental cost is estimated at 99 USD/person.</p> <p>According to the Climate Change Policy for a Resilient Water Sector published by the MoWI, RWH is among the prioritized solutions, as it scores highly in regards to cost efficiency and synergy between adaptation and mitigation.</p> <p>7. An article by former Minister of Water Eng. Hazem Naser shows that installing a water harvesting system can reduce household water bills up to 40% annually.</p>	
3.3. Greywater treatment and reuse in 35 schools and 5 mosques	843,112	T: 39,582 W: 21,940 S: 6827	T: 863,691 W: 445,440 Y: 259,107 S: 205,202	21,333	0.981098	<p>Alternative 1: Sand Filter System Total cost: 792,000USD Cost per beneficiary: Direct: 20USD Indirect: 0.92USD</p> <p>Alternative 2: Constructed Wetlands: The wetland system composes of a rectangular basin that is constructed underground and filled with gravel or sand or a combination of both. Total cost: 1,352,000*USD Cost per beneficiary: Direct: 34USD Indirect: 1.6USD*Excluding potential cost of land acquisition</p>	<p>1. Sand filters are among the most commonly used systems in the treatment of greywater, however are restricted by low efficiency of BOD, COD, and TOC removal and prone to frequent clogging problem, requiring more frequent maintenance, thus, more expensive O&M cost (approx. 56,000/year), or else may result in effluent that is not in compliance with the Jordanian National Standards.</p> <p>2. Constructed wetlands primary requirement is a continuous supply of water, which is not the case in schools since influent flow will be intermittent.</p>	
3.5. Efficient treatment and reuse of wastewater in Jordan	Maerad Akaider Mafrag	1,053.3 32426.3 57 496,400 130,575	T: 77 W: 34 Y: 20 S: 15 Farms: 25 T: 78 W: 34 Y: 20 S: 15 Farms: 32 T: 120,275 W: 35 Y: 20 S: 25 Farms: 40	T: 11,2297,9 19 W: 3,789 Y: 1,980 S: 396 T: 1,649 W: 739 Y: 494 S: 165 T: 1,664 W: 814 Y: 498 S: 166	4,098.6 40095.537 6,364 1,088	53.8 304 78.693 9	<p>There were some non-cost effective development alternatives to the intervention such as construction of new WWTPs with or without lifting stations, or expansion of existing WWTPs to secure targeted quality and quantity of treated wastewater. However, such options are very costly let alone the cost for full comprehensive ESIA studies in view of environmental consideration, land acquisition and resettlement, and inconvenience related to construction works.</p> <p>With regard to the cost effectiveness of the irrigation system to be utilized, during the consultation session in the three WWTP intervention areas, farmers attributed frequent blockage of their traditional (surface) drip irrigation systems due to the presence of solid waste mixed with water, which led many to resort to flooding irrigation. Flood irrigation requires an amount of water much higher than the current average amount of 1-3 cubic meters per dunum planted.</p>	<p>1. According to the Climate Change Policy for a Resilient Water Sector published by the MoWI, Wastewater reuse is among the prioritized solutions, as it scores highly in regards to cost efficiency and synergy between adaptation and mitigation.</p> <p>2. Wastewater reuse will help preserve the natural resource, and decrease illegal groundwater pumping which is decreasing the quality and quantity of water in Jordan.</p>

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⁸⁸ <https://jordantimes.com/news/local/public-urged-harvest-rainwater>

							<p>leaving some areas of their land uncultivated besides the high evaporation rate.</p> <p>Moreover, the surface irrigation system was very costly also due to the damage caused at every harvest (8 times annually), where pipes get pulled out of place. Thus, the cost effective irrigation system chosen is subsurface drip irrigation.</p> <p>Surface irrigation (eg. sprinklers) are not water conservative, and evaporation rates are high. Moreover, according to standard on treated domestic wastewater (Jordanian standard JS-893/1995), surface irrigation is prohibited. Alternative 1: Construction of new WWTP with a capacity of 100,000 m³ per day. Total cost: Approx. 340,000,000*USD⁸⁹ Cost per beneficiary: Direct: 1,236,363.6USD Indirect: 30,278.7USD* <u>Excluding costs of required full comprehensive ESIA studies, and potential land acquisition and resettlement costs</u></p> <p>Alternative 2: Expansion of existing WWTP (increase capacity by 100,000 m³) Total cost: 282,000,000USD⁹⁰</p> <p>Cost per beneficiary: Direct: 1,025,454.6USD Indirect: 25,133.5USD Alternative 2: Expansion of existing WWTP (increase capacity by 100,000 m³) Total cost: 282,000,000* USD⁹¹ Cost per beneficiary: Direct: 1,025,454.6USD <u>* Excluding costs of required full comprehensive ESIA studies, and potential land acquisition and resettlement costs</u></p>	
3.7. Water-use Efficient irrigation of treated wastewater in Jordan	Maerad Akaidar Mafraq	406,400 398,000 <u>804,400</u>	IT: 156 W: 62 Y: 40 S: 30 Farms: 40 T: <u>120275</u> W: 35 Y: 20 S: 25 Farms: 40	T: 9568 W: 4528 Y: 2474 S: 564 T: 4,661 W: 29 Y: 814 S: 498 T: 166	2,624.9 3,316.7 <u>2,925.1</u> 3000	42.5 239.67 <u>1.6</u>	<p>Alternative 1: Surface drip irrigation Total cost: 563,080USD Cost per beneficiary: Direct: 2,047.6USD Indirect: 50.1USD Total cost: 563,080USD Cost per beneficiary: Direct: 2,047.6USD</p> <p>Alternative 2: Flood irrigation Total cost: 171,020</p>	<p>1. Subsurface irrigation pipes and fittings usually cost 4,231USD per dunum. However, a system with pipes and fittings costing 2,000USD per dunum was successfully tested locally, and will be used for this intervention.</p> <p>2. Surface drip irrigation is initially cheaper to set up, however, very costly from an operational point of view, based on previous experiences at every harvest (8 times annually), pipes are damage and pulled out of place. The consulted farmers expressed that they do not prefer surface drip irrigation.</p> <p>— Flood irrigation requires an amount of water much higher than the current average amount of 1-3 m³ per planted dunum, leaving some areas of land uncultivated besides the high evaporation rate. This goes against the objective of project, which is to decrease use of unsustainable water resources. Subsurface irrigation pipes and fittings usually cost 4,231USD</p>

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⁸⁹ <https://www.oecd.org/derec/adb/47174022.pdf>

⁹⁰ https://www.miga.org/sites/default/files/archive/Documents/Samra-ESIA_Final_Report_May7.pdf

⁹¹ https://www.miga.org/sites/default/files/archive/Documents/Samra-ESIA_Final_Report_May7.pdf

							<p><u>Cost per beneficiary:</u> <u>Direct: 621.9USD</u> <u>Indirect: 15.2USD</u><u>Total cost: 171.020</u> <u>Cost per beneficiary: Direct: 621.9USD</u></p>	<p>per dunum. However, a system with pipes and fittings costing 2,000USD per dunum was successfully tested locally, and will be used for this intervention.</p> <p>— Surface drip irrigation is initially cheaper to set up, however, very costly also due to the damage caused at every harvest (8 times annually), where pipes get pulled out of place.</p> <p>3. Flood irrigation requires an amount of water much higher than the current average amount of 1-3 m³ per planted dunum, leaving some areas of land uncultivated besides the high evaporation rate.</p>
3.8. Permaculture demonstration - closed loop water system in Jordan	384,046	T: 300 W: 150 Y: 45 S: 30 Students: 200	Students: 23,000 W: 11,500 Farmer family: 400 W: 200 Y: 60 S: 40 Community: 2,000 25,400 W: 1,000 Y: 300 S: 200	1,280.2	16.77	<p><u>Alternative 1: Monoculture system</u> <u>Total cost: 326.632USD</u> <u>Cost per beneficiary:</u> <u>Direct: 2,047.6USD</u> <u>Indirect: 12.9USD</u> Monoculture systems that decrease life in the soil and results in water loss and an increase in the need to use chemical fertilizers and pesticides.</p> <p>The soil is exposed to evaporation and erosion due to the common agricultural practice.</p> <p>No high-quality inoculant compost, which reflects a poor soil condition with bad water retention abilities. Wasted resources in the form of plant waste</p> <p>Conventional bees systems that relatively require high maintenance while producing less honey in quantity and quality.</p>	<p>Increasing the beneficial soil life reduces the water demand for the crops and orchards by up to 90% over about four years of building the soil material. Which works by creating compost that is not just a soil amendment but a life rich substance that inoculates the soil with life, returning all the crop and the orchard waste to the soil you build soil ecosystem</p> <p>1. Monoculture systems decrease life in the soil and results in water loss and an increase in the need to use chemical fertilizers and pesticides.</p> <p>— Irrigation constituted about 53% of total water use in Jordan in 2014. (Figueroa, Mahmoud and Breisinger, 2018). In comparison with the average crop water use in Jordan, permaculture results in a 50% reduction by using compost which increases water retention in soil. 100% reduction in chemical use and up to 200% increase in yield. Water demand will also be reduced by shading the soil with a shade house or by an over-story orchard trees with a mixture of trees and mixture of crops continuing to feed the soil by including chicken in the process to enhance soil life with cycling the chickens and their manure very carefully which benefiting the soil and getting the chicken products which applies to the crops and the orchards. Monoculture systems decrease life in the soil and results in water loss and an increase in the need to use chemical fertilizers and pesticides.</p> <p>— Permaculture results in 50% reduction in water use by using compost which increases water retention in soil. 100% reduction in chemical use and up to 200% increase in yield.</p> <p>2. Comparison of average crop water use in Jordan which can be reduced by 50%.</p>	

Table 8b: Lebanon proposed concrete adaptation actions' cost-effectiveness rationale under component _3

Adaptation measure	Total project cost	Beneficiaries		Cost-effectiveness (Cost/Beneficiaries)		Alternative Solutions	Justification
		Direct	Indirect	Direct (USD/Beneficiary)	Indirect (USD/Beneficiary)		

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3.1. Install and connect 20 Rooftop rainwater harvesting systems in 11 educational facilities, 7 religious buildings, 1 health facility and 1 municipal building.	867,262	T: 55,000	Municipalities: T: 300,877	15.77	2.88	<p>Alternative 1: Boreholes/wells (groundwater abstraction of at least 50 meters with energy, pumps and filtration units – not considering O&M costs)⁹² Total cost: 2,300,000USD⁹³ Cost per beneficiary: Direct: 41.8USD</p> <p>Alternative 2: Rainwater Collection from Ground Surface. For the same stored quantities. Total cost: 1,417,500USD⁹⁴ Cost per beneficiary: Direct: 25.77USD</p>	<p>1. Rainwater collection from ground surfaces requires constant surface rehabilitation and below ground tanks (i.e. cisterns) which require excavations.</p> <p>2. The over-extraction from the aquifers deteriorates the groundwater quality, increasing its salinity and deepening the static and dynamic water levels.</p>
3.4. Efficient treatment and reuse of wastewater from Zahle WWTP in Lebanon. Initially, wetlands were also proposed but these were not feasible politically.	846,120	From WWTP T: 3,917	Municipalities: T: 184,332	216	4.60	<p>Alternative 1: Construction of new mobile WWTP with a capacity of 5,000 m³ per day. Total cost: Approx. 1,200,000USD⁹⁵ Cost per beneficiary: Direct: 306.4USD * Excluding costs of required full comprehensive ESIA studies, operation and maintenance costs, sludge disposal, energy requirements.</p> <p>Alternative 2: Expansion of existing WWTP (increase capacity to maximum 35,000 m³) This requires completion of the networks upstream in Zahle Total cost: 10,000,000USD⁹⁶ Cost per beneficiary: Direct: 2,553USD</p>	<p>1. According to the National Water Sector Strategy (MoEW), Wastewater reuse is among the prioritized solutions, especially with the continuous depletion of underground water resources, and the 8% decreased in precipitation during the last 30 years compared with earlier periods of the previous century⁹⁷.</p> <p>2. Wastewater reuse will help preserve the natural resource and decrease illegal groundwater pumping which is decreasing the quality and quantity of water in Lebanon.</p>
3.6 Water-use-efficient irrigation of treated wastewater for fruit trees, vineyards and potato plantation in Lebanon from Zahle WWTP, Lebanon	988,950	T: 4,495	Municipalities: T: 253,456	220	3.9	<p>Alternative 1: Surface drip irrigation Total cost: 937,500USD Cost per beneficiary: Direct: 208.57USD</p> <p>Alternative 2: Flood irrigation Total cost: 210,415USD Cost per beneficiary: Direct: 46.8USD</p>	<p>1. Subsurface irrigation pipes and fittings usually cost 4,250USD per hectares. However, a system with pipes and fittings costing 2,000USD per hectare.</p> <p>2. Surface drip irrigation is initially cheaper to set up, however, very costly also due to the damage caused at every harvest (8 times annually), where pipes get pulled out of place.</p> <p>3. Flood irrigation requires an amount of water much higher than the current average amount of 1-3 m³ per planted hectare, leaving some areas of land uncultivated besides the high evaporation rate and dry seasons.</p>
3.9 Permaculture demonstration - closed loop water system in Lebanon	885,725	T (Farmers): 340	T (Farmers families): 3400	1,452	260.5	<p>Alternative 1: Monoculture system Total cost: 753,168USD Cost per beneficiary: Direct: 221.5USD</p>	<p>1. Monoculture systems decrease life in the soil and results in water loss and an increase in the need to use chemical fertilizers and pesticides.</p> <p>2. Permaculture results in 50% reduction in water use by using compost which increases water retention in soil, 100% reduction in chemical use and up to 200% increase in yield.</p>

Altogether, the project will be cost-effective by:

☒ Avoiding future costs associated with damage and loss due to climate change impacts (especially less rain and droughts) and to ensure the interventions are sustainable:

⁹² According to The National Geothermal Resource Assessment of LEBANON (UNDP 2014), wells cost depend on many factors and vary with time, location and the specific: material (cement, drilling mud, etc.), energy supply, logging and testing, services, pumps, heat exchanger, pipes, sloop systems, filters.

⁹³ According to CDR reports, drilling, equipping of three medium size water wells cost 350,000USD (around 115,000USD/ well).

⁹⁴ UN-Habitat Lebanon implemented an underground surface water catchment basin of 80 cu.m in 2018, with all needed drainages, pumps, piping, casing, insulation, connection to electricity, the final cost was 54,000USD.

⁹⁵ Cost estimated by World Vision International for a mobile WWTP in Qabb Elias.

⁹⁶ According to Zahle mayor.

⁹⁷ National Water Sector Strategy (NWSS), Ministry of Energy and Water (MEW), 2010.

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- ☐ Efficient project operations because of 'in-house' technical support options and capacity building expertise and because of direct partnering with communities (thereby building their capacity as well as reducing costs) and specialist agency such as UNICEF and UN-ESCWA
- ☐ Community involvement with development / construction of concrete interventions and because of community capacity building especially for youth who would ensure the sustainability of the project.
- ☐ Having selected technical options based on cost-, feasibility and resilience/sustainability criter

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E. Consistency with national or sub-national strategies

Both Jordan and Lebanon have advanced climate action agendas, since both countries ratified the UNFCCC in 1994. Both countries submitted the Third National Communications (TNC) and an INDC to the UNFCCC, while also having done Climate Change Technical Needs Assessments (TNA). Jordan also has a national climate change policy (also for water). However, the institutional and individual capacities, especially at sub-national levels, for effective climate programming (e.g. through spatial strategies and planning) is still weak. A detailed overview of project consistency with all relevant national and sub-national priorities has been developed in table 9 below.

The project proposal especially aligns with the INDC, TNC and TNA and National Water –(Sector) Strategies in both countries. In Jordan, the project proposal also aligns with the National climate change policy (for water). Relevant ministries have been consulted to fully align with their most recent priorities (see section II.I). During the full proposal development phase, the established national project steering committees re-prioritised some interventions, including ~~the proposed wetlands in Lebanon and the selected WWTP in Jordan~~. In both Jordan and Lebanon, municipalities are mandated to develop municipal master plans. Moreover, municipalities are required to manage water, especially non-conventional sources such as stormwater and rainwater, within their municipal boundaries. Although Irbid has a master plan, it is outdated and other municipalities don't have these plans, which can be used to manage water within their boundaries, including consideration of climate change, DPs migration trends and gender.

Table 9: Jordan project alignment with National and sub-national priorities

Policy / Document	Year submitted / ratified	Relevant priorities
Jordan		
Climate Change strategies / plans		
Jordan's Climate Change Policy for a Resilient Water Sector (2016-2025)	2016	<p>This document is an integral part of the National Water Strategy (2016 – 2025) and related policies and action plans published by Ministry of Water and Irrigation (MoWI). It lists a number of water-related solutions that the project aligns with. These include:</p> <ul style="list-style-type: none"> Water storage e.g. dams & reservoirs and ponds New water, water harvesting (in combination with supplementary irrigation for drought and climate-proofing and increasing the water use efficiency of primarily rain fed agriculture, which is practiced on 60% of Jordan's cropland), water transfers, wastewater collection/treatment/reuse Water quality protection and improvement, to increase water availability for unrestricted use; Integrated water and land planning / management / zoning, water-smart land use, including urban planning Water (and energy) demand management: via technical measures, e.g. infrastructure rehabilitation and reduction of transmission losses (according to the 3rd National Communications the main threat to rainfed cultivation in Jordan is urban expansion). Better use of rainfall, more efficient irrigation Improvements in water use efficiency, e.g. driven by demand-management or water reallocations, these generally also translate into energy savings¹⁸; Training and capacity development: public awareness and behavioural change e.g. mainstreaming climate expertise into water management, facilitating the use of climate data for planning and early warning (climate services); and training of experts for writing successful proposals to international climate funds. <p>The action plan for the Climate Change Policy can build on existing Integrated Water Resources Management (IWRM) activities. However, the implementation has been slow so far. In order to avoid such problems, the action plan needs to include incentives for effective implementation and enforcement of the Climate Change Policy.</p>
Jordan's Third National Communication on Climate Change	2014	<p>A document submitted to UNFCCC by the Ministry of Environment and United Nations Development Programme, it stated that the expected reduced precipitation, maximum temperature increase, drought/dry days and evaporation are the main determinants of climate change hazards. The impact of the increased evaporation and decreased rainfall will result in less recharge and therefore less replenishment of surface water and groundwater reserves.</p>

		<p>In the long term, this impact will extend to cause serious soil degradation that could lead to desertification, exacerbating future conditions and worsening the situation of the agricultural sector due to the lack of sufficient water that will affect the income of the agriculture sectors.</p> <p>The proposed project aligns with the document by; Enhancing climate vulnerability analysis at the local level. Implementing the adaptation strategies and measures suggested by the report specifically for the water sector; Rainwater Harvesting Wastewater treatment Desalination Increasing Efficiency of irrigation technologies Greywater Reuse Raise Public Awareness</p>
Jordan's Intended Nationally Determined Contribution (INDC)	2015	<p>The project is well aligned with some of the adaptation measures for the water sector listed in the INDC: Reducing water losses in distribution pipes; Introducing water saving technologies such as low-flow toilets and showers, and efficient appliances; Collection of rainwater for gardens, toilets, and other applications; Promoting water saving by awareness campaigns. Improving wastewater treatment plants (WWTP); Recycling wastewater; Increasing public awareness to water related issues;</p>
The National Climate Change Policy of the Hashemite Kingdom of Jordan (2013-2020)- Sector Strategic Guidance Framework	2013	<p>National Climate Change Policy, published by the Ministry of Environment of Jordan, aims to achieve a pro-active, climate risk-resilient Jordan, to remain with a low carbon but growing economy, with healthy, sustainable, resilient communities, sustainable water and agricultural resources, and thriving and productive ecosystems in the path towards sustainable development. 8 of 14 Climate Change Policy are designated for a Resilient Water Sector This Policy will provide guidance to the Government of Jordan to implement the major climate change objectives of national priority related to adaptation</p> <p>The project is aligned with numerous adaptation measures listed as follows: Water Sector: Further mainstream climate change consideration in water sector strategies, policies, and planning documents on all levels; Address the use of treated/recycled wastewater in the regulation/ directives on the demand-side such as grey water as part of codes and regulations for buildings including, high-rise and high-density buildings; Improve the domestic water distribution networks, including reducing water losses and energy efficiency in pumping; Develop proposals for adaptation in the water sector for financing from international climate change adaptation funds Agricultural/food security and production: Develop a comprehensive insurance system for agriculture; Permaculture. Promote water use efficiency in agriculture.</p>
Climate Change Technology Need Assessment Project of Jordan (TNA)	2017	<p>The Report outlines all the adaptation technology options available for water sector in Jordan and prioritized them based on most cost-effective, sustainable and socially acceptable options. It also highlighted the main barriers to adopting each of these technologies that should be addressed.</p> <p>The top three adaptation technologies for water sector include rainwater harvesting; water users association; and desalination/brackish water treatment and re-use.</p> <p>The AF project is in line with TNA plan which has selected water and agriculture as two of Jordan's most significant adaptation sectors.</p>
NAP	(Forthcoming in 2020)	
National Development strategies / plans		
Jordan 2025- Part 1 Jordan 2025- Part 2	2015	<p>This document (Jordan 2025) represents a long-term national vision and strategy (framework) rather than a detailed government action plan. The vision acknowledged the impact of climate change in widening the gap between water supply and water demand. The project is aligned with the vision's objective to maximize the utilization of water and the reuse of waste water.</p>
Jordan Economic Growth Plan 2018-2022	2018	<p>The JEGP is comprised of economic, fiscal and sectoral strategies that outline the vision and policies pertaining to each sector published by The Economic Policy Council.</p> <p>The project is aligned with JEGPin terms of achieving water security through :</p>

		<p>Integrating the management of water resources by increasing the quantities of water available and storage capacity of all the WWTP. Also implementing rainwater harvesting interventions</p> <p>Improving the quality of water and wastewater services.</p> <p>Supplying water for agriculture through replacing freshwater from surface and groundwater sources with treated wastewater from wastewater treatment plants</p> <p>Promote efficient use of water in irrigation and high-yield agricultural products.</p> <p>Adopt and publish an updated "Action Plan" to reduce water sector losses.</p>
A National Green Growth Plan for Jordan (2017-2025)	2017	<p>This NGGP seeks to understand what prevents Jordan from implementing the goals established in Jordan's current plans and strategies, and offers suggestions in the context of green growth for other aspirations that will help to futureproof Jordan's Vision. The plan identified water as one of main six priority sectors that provide coverage of key green growth issues and opportunities for Jordan. The project is aligned with the plan in terms of:</p> <p>Acknowledging that water sector presents a crucial challenge to Jordan and that climate change has exacerbated existing water security issues resulting in significant negative implications for social development. Promoting the reuse of wastewater</p> <p>Reallocate humanitarian funding towards more strategic interventions to boost to boost resilience and minimise environmental impacts of refugee communities e.g. microgrid renewable energy, water harvesting</p> <p>Implementing a water provision intervention which could take the form of a desalination plant, a dam or a form of water harvesting.</p> <p>Educate the locals and different decision-making bodies on value and scarcity of water and on making water-efficient project decisions</p>
Environmental strategies / plans		
Strategic Plan of the Ministry of Environment in Jordan (2017-2019)	2017	<p>This document addresses the programs and plans of the Ministry of Environment in Jordan during 2017-2019 to ensure the continuation of the ministry's pioneer and pivotal role successfully, in light of the challenges that are surrounding the region, and the accelerated changes in recent years.</p> <p>The project is well aligned with one of the objectives of the plan which is to prevent and reduce the negative impacts on the environment caused by pollution & climate change.</p>
The Aligned National Action plan to Combat Desertification in Jordan 2015-2020	2015	<p>The project will contribute to achieving the objectives of this action plan through mainstreaming climate change in planning in the target areas and so strengthening the enabling environment to adapt to drought in these areas. .</p>
The National Biodiversity Strategy and Action Plan (NBSAP) in Jordan 2015 - 2020	2015	<p>The 2015-2020 NBSAP embraces a new vision for Jordan's biodiversity as follows: The project is specifically aligned with the objective regarding ecosystem services and climate change: through enhancing the national understanding of dryland ecosystem benefits to national resilience, economic sustainability and local livelihoods. This is mainly through increasing resilience to climate-induced drought.</p>
Sectoral strategies / plans, especially related to water		
Jordan's National Water Strategy (2016-2025)	2016	<p>This document represents the vision and reference of the water sector in Jordan, which sets the goals and objectives for the water sector and also provides an initial response to Jordan's commitment to the Global Sustainable Development Goals,highlighting the need for stronger intersectoral coordination and producing a National Water Master Plan, including Management Plans for managing water resources and water demand.</p> <p>The proposed project is generally well aligned with the adaptation to climate change measures. In addition, the project will contribute to reducing inefficient use of water as well as increasing water supply for irrigation.</p>
Water Demand Management Policy 2016	2016	<p>This policy addresses the management of water demands in all sectors, including municipal, industry, tourism, agriculture and other activities of national importance and lists a wide range of capacity building, institutional, economic and technical measures for demand management.</p> <p>The project is aligned with the policy in terms of:</p> <p>Maximizing the utilization of the available water and minimize water losses and conserve water resources, promote effective water use efficiency, to adapt with the challenge we</p>

		<p>face of water scarcity in order to reduce the gap between supply and demand. It supports the achievement</p> <p>Updating codes and technical regulations periodically to ensure the installation of Rainwater harvesting systems in new construction (residential, commercial, industrial, tourism, etc.) where the size of the storage tank that depends on average rainfall and the surface area of the building is considered within the construction code.</p> <p>Continue implementation the replacement of all inefficient plumbing fixtures, appliances and equipment with the latest most efficient models. Assist low income consumers to obtain water saving devices for free or stimulatory prices</p> <p>The introduction of best technologies and modern and advanced irrigation systems in terms of the efficient water use in agriculture</p> <p>Expansion in establishing water harvesting systems "dams, ponds, excavations" in all regions of the Kingdom especially in the highlands and desert areas that are suited for it, this water can be used in different purposes and agriculture in particular.</p> <p>Continue public awareness campaigns and water education through several means of communication and media focusing on water scarcity and spreading the culture of awareness and responsibility to protect the water sources and its efficient use</p>
Surface Water Utilisation Policy	2016	<p>This policy, published by MoWI as an integral part of National Water Strategy, aims to present in more details what is envisioned towards the maximum utilization and optimum use of surface water, its protection, its management, and propose measures needed towards successfully integrating all its components. Also it addresses the interactions between the different resources and with different qualities, especially treated wastewater, to reach the maximum amounts of supply fit for use and the optimal return per meter cube; the proposed project is aligned with the Surface Water Utilisation Policy in terms of:</p> <p>Maximizing the use of surface water to the greatest extent possible by increasing the storage capacity of dams, construction of new dams, and investment in rainwater harvesting in remote areas and from rooftops.</p> <p>Constructing water harvesting schemes (ponds and desert dams) in the Highlands.</p> <p>Increasing Jordanians' awareness of water scarcity and the importance of conserving and protecting Jordan's limited water resources.</p> <p>The quality of treated wastewater from all municipal and industrial wastewater treatment plants shall comply with Jordanian standards, monitored regularly, and reviewed periodically.</p>
Jordan's Decentralized Wastewater Management Policy (2016-2025)	2016	<p>This Policy is an integral part of the Jordan's National Water Strategy that was published by MoWI. One of its key objectives is to seek measures to adapt to the increasing pressures from climate change on public sewer and wastewater treatment facilities. The project will follow the guidelines for wastewater reuse in all the interventions related to greywater and wastewater reuse.</p>
Water Substitution and Reuse Policy (2016-2025)	2016	<p>The Water Substitution and Reuse Policy, an integral part of the Jordan's National Water Strategy published by MoWI, aims at substituting freshwater with treated wastewater and possibly other non-conventional water sources, avoiding negative impacts on water and soil quality, and which also refers to the principles of IWRM. The project is well aligned with the main objectives of this policy which are:</p> <p>To cope with the scarcity situation by enhancing the efficiency of the management of the scarce water resources in Jordan through maximizing the benefits and returns, and proposing actions required for implementation.</p> <p>To increase the amounts of treated Wastewater (WW) and considering it as a potential water and revenue source</p> <p>To ensuring sustainability and preservation of water resources.</p>
Water Sector Capital Investment Plan 2016 – 2025	2016	<p>This plan, which is an integral part of the Jordan's National Water Strategy published by MoWI, defines its main aim as the sustainable development and management of water resources.</p> <p>The proposed project is well aligned with the two key focus areas of the plan that are essential to respond to Jordan's increased water scarcity;</p> <p>[1] The development of new water resources by implementing rainwater harvesting systems and encouraging reuse of treated wastewater and greywater</p> <p>[2] The expansion of wastewater treatment services.</p>
Water Reallocation Policy (2016-2025)	2016	<p>This policy, which is an integral part of the Jordan's National Water Strategy published by MoWI, prioritizes and re-allocates water from different sources (e.g. groundwater use considering safe yields) between the different sectors and governorates according to adaptive capacity, and at the same time at reducing non-revenue water.</p>

		<p>The proposed project is well aligned with the policy in term of: Maintaining acceptable water quantities for different areas and excellent water quality Frequency of water supply during summer and winter by implementing rainwater harvesting system Collecting and treating wastewater for safe agricultural use.</p>
National Strategy for Agricultural Development 2016-2025(In Arabic)	2016	The National Strategy for Agricultural Development 2016-2025 stated that among challenges facing the agricultural sector is desertification in Jordan, which is increasing due to climate change, overgrazing and poor agricultural practices. The project is aligned with the strategy in terms of increasing the efficiency of water use in irrigation and the use of non-traditional water resources such as greywater.
Land use plan 2007	2007	<p>Comprehensive plan designating the land use throughout the Kingdom. This Master Plan is distinctive in that it is a directive map illustrating the natural, geographic and demographic characteristics, including the sustainability of natural resources. The plan aims to:</p> <p>Preserve agricultural lands, ensure its continuity, and its development. Control the arbitrary urban sprawl Limitation of urban development based on natural features and actual needs Protect the environment from pollution.</p>
Water for Life Jordan's Water Strategy 2008-2022	2008	<p>This document is Jordan's vision for a water strategy published by MoWI prior to the National Water Strategy, where it emphasis on the fact that Jordan must manage its water resources giving priority to municipal and industrial needs and cap agricultural use.</p> <p>The proposed project is well aligned with the strategy in terms of; Increasing awareness among the Jordanian public and decision makers to seek behavioral change and lay the foundation for policy change. Policy and Regulation change and enforcement in the municipalities.</p>
The National Strategy for Health Sector in Jordan 2016-2020	2015	This strategy represents the general framework for developing and strengthening the capacity of the health system to face the challenges and raise Jordan's leading position in the provision of health care. The threats include climate change impacts on health. In the context of this project, community consultations in most of the target areas have shown that there has been an increase in diseases due to climate change.
Jordan Response Plan for the Syria Crisis 2018-2020 JPR 2018-2020 Annex	2017	<p>The project is well aligned with sector specific objectives under Environment and WASH Sectors as per the details below:</p> <p>Environment sector: SSO1: Improved mechanisms to mitigate pressure and competition for ecosystem services (land, water) resulting from refugee influx Wash sector: SSO1: Quantity, quality and efficiency of safe drinking water delivery improved and system optimized. SSO3: Strengthened sector planning, implementation, monitoring and coordination. SSO5: Sustainable provision of safe and equitable access to water services in host community as per min standards.</p>
Sub-national plans		
Irbid 2030: Greater Irbid Area Plan	2010	<p>A growth plan that is designated to n provides an overall land use plan and associated policies that direct growth within an urban–rural development concept. The overall strategy of the Plan is to integrate land use, infrastructure and transportation planning.</p> <p>The components of the plan cover 7 subjects and recognize Infrastructure, where the consumption of water and energy and production of waste and heat are inextricably connected to urban infrastructure systems.</p> <p>The proposed AF project is well aligned with the infrastructure guidelines related to water and wastewater in terms of; Increase wastewater treatment plant capacity to accommodate the expansion of the service area. Encourage treated greywater to be used for irrigation purposes.</p>
البرنامج التنموي لمحافظة إربد 2017-2019 (Development Program for Irbid Governorate 2017-2019_Agriculture and Water Sectors)	2017	<p>The project is aligned with a number of proposed interventions by the municipality and the community including rainwater harvesting and rehabilitating water networks. Upscaling wastewater services through rehabilitation of the existing ponds and upgrading the capacity of WWTPs Encourage the usage of treated grey water for irrigation purposes.</p>

<p>الدوام التتوي</p> <p>2017 لمحافظة المفرق 2019-</p> <p>(Development Program for Mafraq Governorate 2017-2019_Agriculture and Water Sectors)</p>	2017	<p>The project is aligned with some of the proposed interventions in the agriculture sector including rehabilitation of water harvesting ponds.</p> <p>Improving the efficiency of residential, manufacturing, commercial and agricultural water supply systems through rainwater harvesting and rehabilitating water networks.</p> <p>Upscaling wastewater services through rehabilitation of the existing ponds and upgrading the capacity of WWTPs.</p> <p>Legislation development</p>
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Table 10: Lebanon project alignment with National and sub-national priorities

Policy / Document	Year submitted / ratified	Relevant priorities
Lebanon		
Climate Change strategies / plans		
Lebanon's Intended Nationally Determined Contribution	2015	<p>This project aligns with the water related climate change adaptation priorities listed in the INDC:</p> <p>Rehabilitation of existing water networks</p> <p>Artificial recharge of groundwater aquifers</p> <p>Improving water efficiency and decrease water loss in irrigation</p> <p>Increasing wastewater collection and treatment</p> <p>Increasing water re-use, especially after wastewater treatment</p>
Lebanon's third national communication to the UNFCCC	2016	<p>The project is well aligned with some adaptation measures for the water sector listed in the report:</p> <p>Increasing the water-use efficiency of domestic, industrial, and agricultural sectors,</p> <p>Developing watershed-managed plans appropriate for expected changes in climate, investigating the feasibility of alternative sources of water supply, and improving the available information about Lebanon's water resources and water systems</p> <p>The report prioritized the installation of rainwater harvesting systems in agricultural greenhouses around different locations in Lebanon</p>
Lebanon's Technology Needs Assessment project	2012	<p>The Report outlines all the adaptation technology options available for the water sector in Lebanon and uses a criteria-based weighting system to prioritize the most cost-effective, sustainable and socially acceptable options. It also highlighted the main barriers to adopting each of these technologies that should be addressed. The report lists a number of water related solutions that the project aligns with. These include:</p> <p>Rainwater harvesting from greenhouses, hill lakes and rivers.</p> <p>Efficient water use irrigation systems</p> <p>Use of treated wastewater in irrigation</p>
National Development strategies / plans		
National Physical Master Plan of the Lebanese Territory (NPMPLT)	2005	<p>The NPMPLT was endorsed by a decree issued by the Council of Ministers in July 2009. It is a strategic reference document that overrides all documents concerning regional and local urban development and planning. It is not only the framework for urban planning policy, but also serves as a guideline for all stakeholders participating in the national and land use development. The NPMPLT tackles water resources management through land use plans and measures consisting of the following:</p> <p>Launching legislative and legal reforms that define the principles of land use</p> <p>Elaboration of several local urban plans with precedence to the zones threatened by urban linear expansion and agricultural lands jeopardized by urban structures.</p> <p>The report defines different challenges that Lebanon is facing today and might face in the future. One of those important challenges is wastewater management.</p>
Disaster Risk Reduction strategies / plans		
UNDP –DRM Unit LEBANON Monitoring of Sendai Framework 2017	2017	<p>The report outlines national updates on strengthening disaster risk management capacities in Lebanon. Target G5 of this report highlights the importance of disaster risk information through a national flood risk map. The project is in line with this target as it also aims to control floods in target areas.</p>
Environmental strategies / plans		

Support to Reforms – Environmental Governance (StREG) Programme	2017	Main aims: increasing the effective capacity at the MoE to plan and execute environmental policy enforce environmental law mainstream environmental issues in key line ministries
The Practical Guide for Municipalities to Enhance Environmental Management (2017)	2017	This report supports this project by presenting the problems that the municipalities face in the water sector, and the measures and actions that they can take to solve these challenges. It highlights all the laws and regulations related to water resources management as well as the roles of all stakeholders involved in that sector.
State and Trends of the Lebanese Environment	2010	This report provides an overview of the current condition of natural resources and environmental management in Lebanon. It gives an analysis of past and future developments across multiple sectors. It describes the impacts of rapid population growth, urbanization and climate change on water resources, then outlines the opportunities for improving the water sector. The project is in line with the selected responses presented in this report. Wastewater collection, treatment and reuse is one of the main opportunities presented in this report. Also, rainwater harvesting is outlined as another water resource augmentation option.
Sectoral strategies / plans, especially related to agriculture		
MoA/FAO Strategic Plan 2015-2019	2014	<u>The strategy specific objectives are three-fold:</u> <u>I) To provide safe and quality food;</u> <u>II) To improve the contribution of agriculture to the economic and social development of the country;</u> <u>III) To promote the sustainable management of natural and genetic resources.</u>
Sectoral strategies / plans, especially related to water		
National Water Sector Strategy (NWSS) 2010-2020		Environmental concerns: Climate change negatively impacting water resources The strategy is in line with the project since it aims at: Collection and treatment of at least preliminary levels of 80% of wastewater by 2015, and of 95% by 2020. Secondary treatment and reuse for all inland and for coastal systems where reuse is applicable by 2020. Irrigation and sanitation services through 16 initiatives involving institutional & organizational reforms and financial, commercial and environment initiatives, refining climate change knowledge on the water sector and preparing the sector for private sector participation.
Strategy for the Wastewater Sector (MoE)	2010	Presents a strategic roadmap to improving water sector infrastructure and management.
National Physical Master Plan of the Lebanese Territory	2005	It's the only national master plan that was drafted. It is not yet approved and implemented. The plan has predicted that there will be an increase in demand for water following population growth and increase of agricultural and industrial use of water.
Health Strategic Plan	2016-2020	Second Strategic goal set out by this plan is to improve collective public health through water and environmental controls.
Lebanese Crisis Response Plan (LCRP)	2017-2020	The LCRP is designed to: 1) Ensure humanitarian assistance and protection for the most vulnerable among persons displaced from Syria and poorest Lebanese; 2) Strengthen the capacity of national and local service delivery systems to expand access to and quality of basic public services; and 3) Reinforce Lebanon's economic, social, environmental, and institutional stability.
Sub-national plans		
Water Sector Lebanon - Bekaa governorate water supply (Map)	2017	Map showing existing water networks, wells and reservoirs in Bekaa governorate. It also highlights projects implemented or under construction.
Litani river basin management support program action plan for water resources awareness and	2009-2014	Proposes an action plan aimed at improving the management of the Litani river through awareness projects that target schools, farmers and municipalities.

enforcement (USAID)		
Water Sector Lebanon - Bekaa and Baalbeck El-Hermel wastewater network (Map)	2015	Map showing existing wastewater networks and wastewater treatment plants in Bekaa and Baalbeck El-Hermel. It also highlights the most vulnerable localities in the two governorates.
Water Supply and Wastewater Systems master plan for the Bekaa Water Establishment	2015-2035	Report presents work related to the development of the Master Plan and the adoption of recommendations for the year 2035 for proposed action plans for water and wastewater sector in Lebanon.

F.E. Compliance with relevant national technical standards

The project fully aligns with national technical rules, regulations and standards, including those for environmental and social risks screening and impacts assessments, building codes, land use planning, water supply / harvesting / reuse, etc. ~~As required by national law, an environmental and social impacts assessment is being finalised for the proposed wetlands in Lebanon.~~ Although other proposed interventions don't require risks screening and impact assessment by national laws, accredited consultant have been hired in both countries to do this anyways to comply to AF ESP and GP requirements. Outputs include feasibility assessment report, EIAs report, National ESMP and consultation report. For more information see annex 4.

Jordan

Process to comply to national technical standards: compliance will be attained by:

1. Abiding with provisions of the governing Jordanian legal document (laws, by-laws, standards, codes, etc.) through conforming to the relevant rule(s);
2. In cases a permit is required from the authorizing entity to fulfil certain regulatory requirements, in which obtaining the permit entails following no standardized procedure, the project initiator will prepare an official letter addressed to the authorizing Ministry to obtain the approval. This is usually requested at preliminary phases of the projects. During the full proposal development phase, sub-projects proposals will be shared with the ministries to check if permits are needed.
3. If the permit is only issued based on a standardized procedure and a risk management tool is needed, the specific procedure will be followed based on the governing Jordanian [Environmental Protection Law No. \(6\) of 2017](#) and Environment Impact Assessment Regulations of 2005, by-law or Instructions (i.e. ESIA permit based on Ministry of Environment-administrated ESIA Bylaw no. 37 of the Year 2005 will be obtained including developing an ESMP for activities that are required to develop an EIA, etc.). In all cases sub-project proposals need to be submitted to the Ministry of Environment to decide on the type of EIA required based on the EIA compliance process shown in the figure. This will be done during the full proposal development phase. A first screening shows that no EIA may be required as there is no mentioning of EIA requirements for water-project, except 'deep drilling and because no sub-project in the proposal entails substantial construction activities. For agriculture project, EIA are only required for cattle breeding farms.

Figure 9: EIA compliance process

A draft Local Administration Law, a new piece of legislation is currently being drafted by the government and sent to Parliament for debate. This law will replace the decentralization law and municipalities law. It governs and organize the work of the governorate and the city at local level and defines the responsibilities of local authorities, including for climate change. The idea is to empower local authorities and ensure that all the services are secured in each governorate by the local governorates/

According to the draft law, municipalities are fully responsible for managing stormwater, floods, and for coordinating with the concerned authorities in managing the distribution of water among the population, organizing its distribution, participating in identifying water network and working to prevent pollution of

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springs, wadis and wells. Municipalities are also responsible for coordinating with concerned authorities on establishing wastewater network.

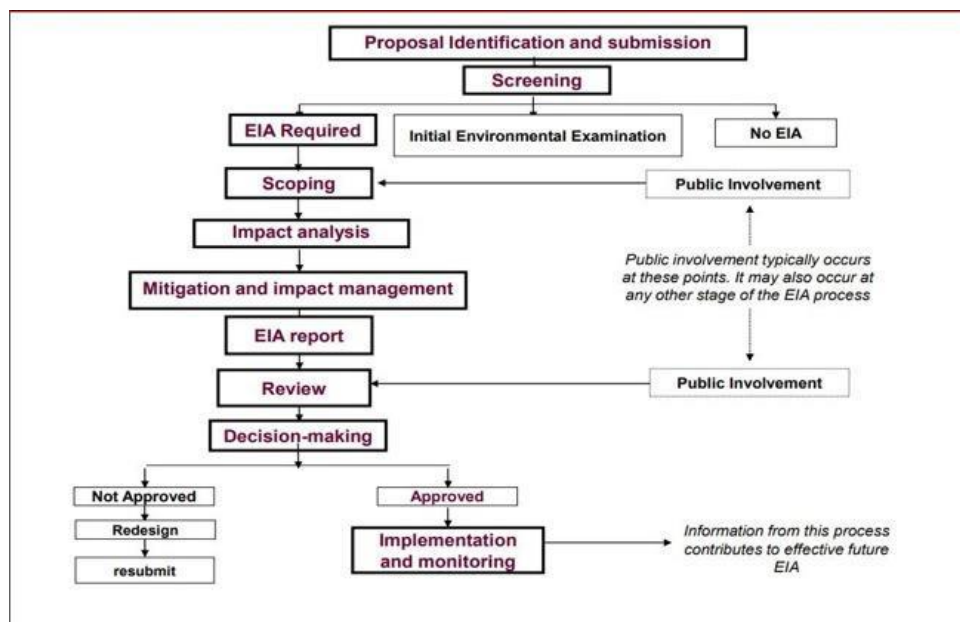


Table 11: Compliance with relevant national technical standards

Expected concrete output/intervention	Relevant rules, regulations and standards (to comply to AF principle 1)	Compliance procedure and authorizing offices
Output 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan	<ul style="list-style-type: none"> • Local Administration Law • Cities, Villages and Buildings Planning Law and Amendments thereof No (79) for the year 1966 • Building, Villages and Cities Regulating by-law and amendments thereof for the year 2016 • Land Use Planning By-Law No. 6 of 2007 • Environmental Protection Law No. (6) of 2017 • Cities, Villages and Buildings Planning Law and Amendments thereof No (79) for the year 1966 	See compliance procedure above Required: coordination and approval from Municipalities of Irbid and Mafraq and Ministry of Local Administration – MoLA for Land use-related affairs and strategies
Output 2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8	Not relevant	Operation, maintenance and replication will be coordinated with responsible ministries, municipalities and other entities

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2.9. See above for output 3.9		
Output 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.5. Efficient treatment and reuse of wastewater in Jordan 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration - closed loop water system in Jordan	Environmental Protection Law No. (6) of 2017 EIA Rules, regulations, standards (EIA By-law no. 37 of the Year 2005) (see above) The Jordanian Standard for Reclaimed Domestic Water – JS No. 893/2006 JS:286/2015: Water – Drinking Water, mandatory regulations Water and sanitary wastewater building code, Jordan National Building Council Jordanian National Building Law No. 7 of 1993 and recent Amendment Law No. 24 of 2018 The By-Law of Buildings and Organization of Cities and Villages and its Amendments No. 2 Of 2018 Jordan Green Building Guide Instructions No. G/7 for the Year 2016: Instructions and Conditions to Use Treated Wastewater, Salty Water, and Brackish Water for Agricultural Use Law No. 13 of 2015 concerning Agriculture Law.) Bylaw No. (133) of 2016 Organic Agriculture bylaw Issued pursuant to Articles (7) and (71) of Agriculture Law no. (13) of 2015)	See compliance procedure above EIA rules, regulations, standards and procedures have been followed and EIA, ESMP and consultations reports have been produced and are being approved by the Ministry of Environment (although no EIAs were required by national law (see annex 4) See compliance procedure above Required: coordination with and approval from target municipalities and ministry of water and irrigation for 1) construction harvesting and grey water systems; 2) water quality compliance for toilets and gardening) See compliance procedure above Required: coordination with and approval from ministry of water and irrigation and ministry of environment See compliance procedure above Required: coordination with and approval from ministry of water and irrigation, ministry of agriculture and ministry of environment
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Not relevant	Not relevant

Lebanon

The institutional framework for the water sector in Lebanon is managed by a number of ministries, water establishments, public agencies, municipalities, etc., as per below.

Table 12: Key players and responsibilities in the water and wastewater sectors

Function	MOEW	RWEs	LRA	CDR	MOE	MOPH	Other
Planning	X	X		X			
Licensing and permitting (inc. EIAs)	X				X		X
Capital Investment	X	X		X			X
Infrastructure construction	X	X		X			X
Operation & maintenance	X	X					
Financing (national)	X	X		X			
Financing (external funding)	X			X			
Regulations and guidelines	X				X	X	
Water quality / quantity monitoring	X		X		X		
Hydro-power plants	X		X				

Source: *State and Trends of the Lebanese Environment, 2010*

Figure 10: Legal environmental requirement for any project activity in Lebanon⁹⁸



Table 13: Compliance with relevant notional technical standards

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irrigation of treated wastewater in Lebanon 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon 3.9 Permaculture demonstration - closed loop water system in Jordan/Lebanon	Water and Wastewater masterplan for the Bekaa Governorate 2015 No guidelines for drip irrigation installation exist. Experimental stations at LARI have relevant experience for testing new crop varieties. No national standards for irrigation water quality. FAO standards will be adopted.	Required: coordination with and approval from Ministry of Environment; Ministry of Energy and Water; Bekaa Regional Water Establishment; Lithani River Authority; target Municipalities; Ministry of Agriculture; All testings and approvals will be the sole responsibility of LARI affiliated to the Ministry of Agriculture (MoA). The educational facility will develop a curriculum in coordination between LARI and the Ministry of Education and Higher Education (MEHE) x
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Not relevant	Not relevant

E.F. Duplication with other funding sources

The project will avoid geographical overlap with other projects and complement existing project and use lessons learned where possible. During the project preparation phase, all projects in the target areas and have been mapped to avoid geographical overlap. Besides that, similar project in Jordan and Lebanon and in the region have been identified with the purpose to extract lessons learned and integrate those in the project. An overview of all these projects, has been included in a table 14 below. This has been done through desk research, consultations (see Part II.I) but also by requested inputs from ministries and execution entities, which lead similar project before. With e.g. UNICEF as executing partner, a wealth of knowledge and experience is available regarding WASH in the region. The same accounts for Johud and rainwater harvesting, the Water Authority of Jordan if it comes to wastewater treatment in Jordan. The Permaculture Research Institute is worldwide know institute if it comes to permaculture. UN-habitat will also work with universities and consultancy firms to further develop business cases and incentive mechanism for water harvesting options (output 4.4) and Permaculture (output 3.8). UN-habitat will continue to coordinate with all relevant stakeholders during project implementation to ensure synergies with other (potential) project, also through steering committee meetings.

Table 14: Duplication with other funding sources

Relevant projects and focus	Relevant focus and interventions / activities	Lessons learned	Complimentary potential and non-duplication (see also consultation section)
Global			
'Urban permaculture' by UN-HABITAT's Cities and Climate Change Initiative in in Esmeraldas, Ecuador	<p>Promoting resilient communities in the face of highly probable future food and energy crises and the collapse of water and sanitation services due to Climate Change</p> <p>The project tries to mimic Nature and its ecological cycle with the following components: urban agriculture and healthy food, rainwater harvesting, water recycling, solid waste recycling, and dry toilets.</p>	Greening of urban habitats and environments while harvesting water and producing food have been demonstrated; Permaculture can be used as a climate change adaptation measures in an urban context	<p><u>Complementary</u> Use lessons learned and further develop the concept in urban context for target area (through desk research)</p> <p><u>Non-Duplication</u> In Ecuador</p>
MENA region			
UN-Habitat – with AF funding – Enhance water and livelihood security and social cohesion through adaptation in Syria's Barada watershed (concept to be submitted) – USD 10 million	<p>The protection of water resources (and prevent contamination of surface and groundwater resources / wells)</p> <p>The reduction of water losses;</p> <p>The increase of water use efficiency, supporting water harvesting projects and using high efficiency irrigation methods;</p> <p>The promotion of use of non-conventional water resources (e.g. treated wastewater) and:</p> <p>Improved agricultural production practices (e.g. drought tolerant crops).</p>	Project proposal under development.	<p><u>Complementary</u> Align approach and lessons learned throughout project preparation and implementation (by ROAS)</p> <p><u>Non-Duplication</u> In Syria</p>
IFAD with AF funding - Building Resilience of the Agriculture Sector to Climate Change in Iraq (2018-2023) – USD 10 million	<p>Capacity development to integrate CC adaptation and risk reduction into agriculture planning and production systems</p> <p>Climate-resilient Agriculture Investments</p>	<p>Has not started yet</p> <p>Monitor lessons during project formulation phase</p>	<p><u>Complementary</u> Consider similar approach to capacity building and efficient water supply from tertiary canals up to farmland plots is secured based on climate- proof systems and technologies. ROAS to contact IFAD</p> <p><u>Non-Duplication</u> In Iraq</p>
FAO Water Scarcity Regional Initiative (WSI) Pursuing food and water securities in MENA region	<p>Establishing community-farm demonstration fields to show the benefits of new irrigation technology</p> <p>Implementing a plan to envision future climate change scenarios for 'hotspots' at the regional level</p>	Monitor results (which are not publically available yet)	<p><u>Complementary</u> Potentially complement results related to new technology. ROAS to contact FAO</p> <p><u>Non-Duplication</u> Regional, including Jordan and Lebanon. No overlap with target areas</p>
<p>FAO Dutch-funded Sanaa Basin Project in Jemen (2014-2017)</p> <p>Water sustainability for farmers while empowering women</p>	<p>Construction of wells through a cash-for-work formula for farmers to use for agricultural production.</p> <p>All Water User Associations choose their board members through elections and 30 percent of the seats are designated for women.</p>	<p>Water association and women only access to water can be used as a water management system to reduce conflict between tribes</p>	<p><u>Complementary</u> Consider building upon lessons from Water association and women only access to water approach and cash-for-work formula for farmers to use for agricultural production. ROAS to contact FAO</p> <p><u>Non-Duplication</u> In Yemen</p>
UN-Habitat Sustainable, Inclusive and Evidence-based National Urban Policies in selected Arab States (2015-2020)	<p>Development of a National Urban Policy (NUP) clarifying the mandates of sub-national governments, especially municipalities, in the governance system</p> <p>Particular focus on mainstream climate change in the NUP</p>	<p>There is much interest in enhancing responsibilities of municipal, esp related to climate change. Part of this is to set-up and run urban observatories</p>	<p><u>Complementary</u> This project will complement the NUP formulation process through setting-up and running of urban observatories to</p>

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	process and engage stakeholders in the key climate change issues to be incorporated in the National Urban Policy of Jordan and Lebanon		collect and handle climate change data Non-Duplication No Geographic overlap
Jordan			
CVBD The Jordanian Municipal Observatory	CVBD is implementing a national project to establish municipal observatory in all 100 municipalities to provide reliable and comprehensive database that inform policy and decision making process. The project aims to strengthen the relationship with local authorities and improve the developmental and service- oriented work of municipalities. The data form was prepared and indicators were selected. The CVBD is now validating data and reviewing it and embarking on developing a national portal.	An initial revision of the data form suggests that there is a need to review selected indicators and localize SDG 11 and 13 through municipal observatories and include indicators related to climate change and sustainable cities that could inform the development of municipal plans and help to sustain it.	Complementary <ul style="list-style-type: none"> The project will complement the CVBD national initiative and focus on Irbid and Mafrag and set up a pilot municipal observatory in both municipalities with specific emphasis on climate change. The project could also contribute to the development of guidance book on climate change data collection, analysis and reporting.
	CVBD is guiding the whole process and will be establishing the whole system at national level to which all municipalities will report.		Non-Duplication CVBD has no major activities in Irbid and Mafrag yet.
Jordan government with AF funding - Increasing the resilience of poor and vulnerable communities to climate change impacts in Jordan through Implementing Innovative projects in water and agriculture in support of adaptation to climate change ⁹⁹ (2015-2018) – USD 9,2 million	Waste water treatment plant + monitoring quality Irrigation study Rain/flood water harvesting dam / basin (400.000 m3) with solar panels to reduce evaporation Permaculture – adaptation + ecosystem management in demonstration sites	According to manager Permaculture has promising results for adaptation, reducing pollution and protecting ecosystem Water user associations / cooperation can be used to reach farmers and administer water	Complementary Use permaculture concept in real farms and in urban context Use similar approach for water harvesting basins at farms and in urban areas Water user associations / cooperation can be used UN-Habitat is already in touch with manager and specialists (see also II.I) Non-Duplication In Jordan Valley
UNICEF WASH programme	Supports the Ministry of Water and Irrigation and partners in the Water Sanitation and Hygiene (WASH) sector at three different levels Leading the emergency WASH sector coordination Ensuring access to safe water and sanitation facilities and services in refugee camps and in host communities, and strengthening the Government's capacity to prioritize, plan, implement and monitor.	In host communities, leakage along the water network results in huge losses (up to 60 per cent in some areas) and inefficient operation modalities.	Complementary UNICEF has been consulted to better understand their approach and local needs Compliment UNICEF work (emergency / humanitarian) by supporting sustainable and climate change resilient interventions UNICEF will be executing partner Non-Duplication Through coordination with UNICEF, overlap is avoided; UNICEF mainly focused on piped water
UNICEF - Water Conservation in schools Grey Water Reuse and storm water drainage system	In 2018, a proposal was made to UNICEF to pilot grey water reuse system in four schools to introduce water conservation and reuse in Zaatar refugee camp. The main activities of the project: Reuse the grey water produced by the school for irrigation for no edible groups and flushing purposes	Water sampling and testing to ensure system efficiency.	Complementary UNICEF has been consulted to better understand their approach. UNICEF will be executing partner Non-Duplication

⁹⁹ <https://reliefweb.int/report/jordan/planning-ministry-launches-9-2million-project-adaptation-climate-change>

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	<p>Reduce the public health risk and impact on local ground water aquifers from the discharge of untreated grey water.</p> <p>Provide alternative solution for reducing the cost of desludging and network operation in Zaatari camp.</p> <p>Minimize the operation and maintenance costs.</p> <p>Raise the awareness among the students on the proper use of water reuse</p>		In Zaatari Camp
USAID Hydroponic Green farming Initiative (2015-2017)	<p>The USAID Hydroponic Green Farming Initiative aims to introduce a model that integrates hydroponic farming and renewable energy generation for large commercial farms and small rural households. The greater focus will be on;</p> <p>Promoting hydroponic technology in established farmer networks and targeted communities.</p> <p>Demonstrating the feasibility of hydroponics.</p> <p>Bridging the gap between traditional agricultural knowledge and hydroponic systems through educational material and training exercises.</p> <p>Ensuring prospective farmers have the technical knowledge and funding to access hydroponic technology.</p> <p>Focusing on vulnerable demographics – such as women and youth – when designing outreach and dissemination activities.</p>	Hydroponic can be scaled up as a climate change adaptation measures in Jordan Improve water efficiency in agriculture through hydroponic systems that use significantly less water than traditional farming practices.	<p><u>Complementary</u> Potentially complement results related to new technology and water efficiency Will be further consulted <u>Non-Duplication</u> In Jordan Valley and highlands. No overlap with target areas</p>
USAID - Community Water Harvesting Systems (in Mafraq and Karak)	<p>The project highlights:</p> <p>The application of simple, low cost, and scientifically based water harvesting systems in 4 sites in Mafraq and 2 in Karak.</p> <p>The utilization of harvested water for agricultural production.</p>	Make sure of the availability of active community organizations with resources available for the project such as land and farms	<p><u>Complementary</u>: Use the mentioned Guideline for selecting and sizing water harvesting system <u>Non-Duplication</u> In Mafraq and Karak, however no overlapping with the selected targeted schools in Mafraq.</p>
USAID Mercy Corps - Community-Based Initiatives for Water Demand Management I (CBIWDM.I) and II (CBIWDM.II)	<p>The goal of the initiative is to reduce the social and economic impacts of water resource limitations, as well as responding to the destabilizing effects in Jordan on the water and sanitation sectors caused by the influx of Syrian refugees.</p> <p>The main activities/interventions, to enable rural Jordanian communities to reduce water demand through improved resource management, are as follow:</p> <p>CBO Capacity Building Program</p> <p>Construct rainwater harvesting reservoirs with water catchment systems responds to the immediate need of water and provided a convenient resource</p> <p>Awareness Campaigns at Schools that complement the construction work of rainwater harvesting cisterns implemented at the schools. One of these campaigns is “For all of us” Campaign (لنا كلنا)</p> <p>The initiative provide network support to the Yarmouk Water Company through the provision of emergency equipment, infrastructure works for improved water supply, and outreach and customer service support to YWC.</p> <p>Promote equal access to resources through the empowerment of different water users requires that there is at least one woman on the management committees for each CBO</p>	Conducting leak detection and repairs for municipal water systems to increase water delivery/availability.	<p><u>Non-Duplication</u> In all 12 governorates, however ,no overlapping with the selected targeted area.</p>

JOHUD - The Arteries of The Nation: Repairing Jordan's Water Networks (WRAP) Project	<p>The project was initially developed in 2015 to preserve Jordan's slim water resources, and to provide adequate water resources to the populations. It focused on;</p> <p>Revitalise the springs that provided the local farms with water for crop irrigation in collaboration with Madaba Water Authority</p> <p>Improve quality and quantity of the drinking water helping to improve the health and wellbeing of around 20,000 local residents</p> <p>Repair canals and providing more reliable sources of irrigation water</p> <p>Reduce local household electricity bills, because they no longer using electric pumps to fill the rooftop water tanks.</p>	Water Authority managers were able to determine and measure the real needs and demands in the community.	<p><u>Complementary</u> Help the targeted areas to retain its agricultural character</p> <p>JOHUD will be one of the executing bodies</p> <p>Potential similar results regarding the rehabilitation and upgrading the WWTPs.</p> <p><u>Non-Duplication</u> Ma'een District, in Madaba Governorate</p>
The Hashemite Fund for Development of Jodan Badia - Treated Waste Water Reuse Project – Wadi Mousa	<p>The first community-based project was established in collaboration with the USAID. The local community was provided with technical support to use treated and reclaimed wastewater for irrigating their fodder crops.</p> <p>Improve the livelihoods of local community members in the target area.</p> <p>Reduce the competition on and demand for fresh water resources.</p> <p>Conserve natural resources and better manage the environment through the reuse of reclaimed water.</p> <p>Develop drip irrigation systems for an area of 100 hectares.</p>		<p><u>Complementary</u> source of income for the local community members</p> <p>Badia Fund will be one of the executing bodies</p> <p><u>Non-Duplication</u> Wadi Mousa, Jordan</p>
GIZ – improvement of community water efficiency through cooperation with religious authorities	<p>Religion-based teaching materials are developed for schools and universities and then included in religious education to raise awareness of the issue of water scarcity.</p> <p>Equipping selected mosques in northern and central Jordan with rainwater collection and grey water recycling systems.</p>	It is important to raise awareness of religious leaders and education experts on the issue of water scarcity at mosques and schools to serve as serve as water ambassadors.	<p><u>Complementary</u> Potentially complement efforts related to water efficiency and harvesting in Mosques and Schools.</p> <p>UN-Habitat is already in touch (see II.I)</p> <p><u>Non-Duplication</u> Northern governorates. Through coordination with GIZ, Ministry of Water and Irrigation, Ministry of Awqaf, overlap is avoided.</p>
FAO Project- Reduce Vulnerability in Jordan in the Context of Water Scarcity and Increasing Food/Energy Demand	<p>The project pilots a three-pronged, community-based approach, combining water harvesting, conjunctive use of groundwater, and solar power for lifting irrigation water.</p> <p>Downstream water harvesting in Al-Ghadeer Al-Abyad watershed site</p> <p>Rehabilitation of Al Ghadeer Dam</p> <p>Installing PV system to pump water from the dam to nearby agricultural lands.</p> <p>Assessment of the water harvesting sector in Jordan which will serve as an important input into the development of a sub-sector strategy for water harvesting.</p>	Focus on the creation of a comprehensive policy framework for water harvesting to promote the more efficient use of water resources as well as to better integrate agricultural production policies with the water harvesting efforts.	<p><u>Complementary</u> Potentially complement efforts related to upstream water harvesting.</p> <p>UN-Habitat is already in touch (see II.I) and interventions will be well coordinated</p> <p><u>Non-Duplication</u> Al Mafraq Governorate, around Al Mafraq WWTP. Through coordination with FAO, overlap is avoided.</p>
Permaculture Gardens for schools project Al Jawaseri School Garden project	<p>Al Jawaseri is a permaculture school garden in a hyper arid landscape in the Jordan Valley. A Collaboration between the Permaculture Research Institute of Australia and Kids Are Sweet International. The project enables children in a small village with severe water shortages to learn how to build soil, maximise water retention, and create garden abundance. They focused on;</p>	<p>Use sunken beds lined with builders plastic to retain all the water from drip irrigation.</p> <p>Very successful project to promote permaculture everywhere.</p>	<p><u>Complementary</u> Potentially upscaling this project into some vocational schools in the targeted areas</p> <p><u>Non-Duplication</u> In Jordan Valley, Jordan</p>

	Design a hyper-arid garden Local women empowerment, where the implementation of the project was directed by local women residents Establishment of self-replicating educational demonstration sites across the globe		
Lebanon			
UNHCR Water, sanitation and hygiene programme	UNHCR's strategy on water, sanitation and hygiene (WASH) is aimed at helping both refugees and the Lebanese communities hosting them. It targets the needs of refugees in informal settlements, as well as refugees living in Lebanese communities, through the implementation of water and waste water projects that strengthen and/or rehabilitate existing infrastructure. Rehabilitation of storm water channels to the construction of reservoirs, and even the drilling and equipping of boreholes. Nine water supply systems in the Bekaa and North Lebanon are being rehabilitated	Crucial to support both DPs and host communities.	<u>Complementary</u> UNHCR has been consulted to better understand their approach and local needs Use lessons learned for supporting both DPs and host communities, while adding the climate change component UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> Through coordination with UNHCR, overlap is avoided
UNICEF WASH programme 2013-2016	Three components: Strengthen the capacities and information systems of authorities in Lebanon; Improve access to WASH services for Syrian refugees in ISs (WASH in Emergencies); Improve WASH infrastructure to ensure better service delivery to host communities (WASH in urban areas/stabilization interventions).	Interventions should support national water plan / targets Different targeting strategies required (difference between urban and camp-based refugees) Requires flexibility	<u>Complementary</u> UNICEF has been consulted to better understand their approach and local needs Compliment UNICEF work (emergency / humanitarian) by supporting sustainable and climate change resilient interventions UNICEF will be executing partner <u>Non-Duplication</u> Through coordination with UNICEF, overlap is avoided; mostly piped water
UNDP Support to Host Communities in North Lebanon in the WASH Sector (2014-2017) – USD 8,8 million	Identification, implementation of water supply / storage works and commissioning and handover of works to North Lebanon Water Establishment	Lengthy process for licensing for works	<u>Complementary</u> Complement UNDPs work in target area while also supporting host communities UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> <u>North of Lebanon</u>
Lebanon Recovery Fund (MOE & UNDP)	Systems for rainwater harvesting from the top of greenhouses has been installed in three sites Choueifat, Kfarmashoun and Damour in Mount Lebanon. Collecting rainwater from the top of the greenhouses, storing it in big tanks to be used for irrigation during the dry months.	Farmers are saving all the money they used to spend on purchasing water for irrigation and on pumping. The groundwater quality will be protected from pollution and salinization, since pumping rate and depth will both decrease. Water quantity will be preserved as natural recharge CO2 emissions from energy consumed for pumping water will decrease.	<u>Complementary</u> Benefit from UNDP's guidelines destined for all Lebanese farmers to replicate these pilot rainwater harvesting initiatives. UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> Mount Lebanon
IFAD with AF funding Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (2013-2017) – USD 8 million	Water Management: Rainwater harvested from greenhouse roof tops Water Management: Water efficient irrigation systems deployed Adaptation Techniques Roll-out: Capacity building on adaptation techniques for vulnerable field crops enhanced and Guidelines	Get guidelines	<u>Complementary</u> Consider similar approach to water harvesting and irrigation systems Will be further consulted <u>Non-Duplication</u>

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	and recommendations on agricultural adaptation techniques for vulnerable areas developed		<u>Target is Rural communities</u>
World Bank - Greater Beirut Water Supply Project (2010 – 2020) – USD 370 million	Bulk Water Supply Infrastructure Supply Reservoirs, Distribution Network and Metering Project Management, Utility Strengthening and National Studies Land Acquisition and Resettlement Compensation		<u>Complementary</u> Increase the provision of potable water to the residents in the project area within the Greater Beirut region Strengthen the capacity of the Beirut Mount Lebanon Water Establishment in utility operations UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> Greater Beirut Area
World Bank – Water Supply Augmentation Project (2014 – 2024) – USD 617 million	Construction and construction supervision of the Bisri Dam and the associated access road. Construction and construction supervision of the conveyor pipelines to the existing Joun reservoir and the associated access road Two (2) hydropower plants Expansion of the Ouardaniyeh water treatment plant (WTP) Technical assistance to the Ministry of Energy and Water (MOEW), Beirut Mount Lebanon Water Establishment (BMLWE) and Council for Development and Reconstruction (CDR) on the operation and maintenance of dams; on management of water resources; in developing and implementing awareness raising campaigns on the economic benefits of switching to the public water network and eventual volumetric metering water supply	People will access to clean and improved water supply service without spending additional expenses on alternative water sources.	<u>Complementary</u> Increase the volume of water available to the Greater Beirut and Mount Lebanon area Capacity building to the Ministry of Energy and Water (MOEW) UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> Greater Beirut and Mount Lebanon Area
World Vision (applied projects based on Bekaa water and wastewater masterplans)	Taalabaya Water Network Replacement and Expansion project Rehabilitation of Waste Water Treatment Plant in Ablah Project for Waste Water Treatment for Bar Elias and Dakweh in Bekaa Area	Limit water trucking and informal water services Enhance water supply for vulnerable communities.	<u>Complementary</u> Support to Enhance Basic Infrastructure and Economic Recovery in Lebanon The use of treated wastewater for irrigation. Benefit from network expansion. UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> Follows the masterplan which is coordinated by the Bekaa Water Establishment.
CDR, national government with grant from Kuwait - Rehabilitation of water systems in West Bekaa and villages in East Zahle district - US\$ 32.9 million (CDR report)	Drilling of two wells and equipping of the seven wells, building pumping stations in Shamseen, installation of pumping lines from these two stations to two central reservoirs on Mount Anjar and Mount Terbol; Construction of the two mentioned reservoirs in addition to a reservoir in Majdel Anjar and another in Sultan Yacoub al-Tahta and Construction of two local reservoirs in Jeb Jenin and Kamed el Laouz, installation of transmission line from these central reservoirs to local reservoirs in West Bekaa and East of Zahle villages, construction of transmission lines from the central reservoir in Baaloul to Jeb Jenin and Kamed el Laouz reservoirs and the distribution networks in both towns	No started yet	<u>Complementary</u> CDR has been consulted to better understand their approach and local needs Compliment CDR work (conventional water supply) by supporting sustainable and climate change resilient interventions UN-Habitat is already in touch (see II.I) <u>Non-Duplication</u> Through coordination with CDR, overlap is avoided
CDR, national government - Rehabilitation and improvement of potable	Three tier project:	No started yet	<u>Complementary</u>

water systems in Zahle and surroundings (CDR report)	<p>Part 1: potable water networks in Haoush el Omara and Ksara (under USAID, US\$ 5 million)</p> <p>Part 2: potable water networks in the city of Zahle which are fed from the potable water treatment plant; the cost of (Ministry of Energy and Water US\$ 5 million)</p> <p>Part 3: potable water systems in East Zahle, Dhour Zahle, Touaite, Mouaalaka, Karak, Madina Sinaiya, Qaa El Reem and Hezerta (US\$ 16 million and is funded by the Kuwait Fund for Arab Economic Development, the budget of the Ministry of Energy and Water, the Lebanese Government and managed by the CDR.)</p>		<p>CDR has been consulted to better understand their approach and local needs</p> <p>Compliment CDR work (conventional water supply) by supporting sustainable and climate change resilient interventions</p> <p>UN-Habitat is already in touch (see II.I)</p> <p><u>Non-Duplication</u></p> <p>Through coordination with CDR, overlap is avoided</p>
The International Bank for Reconstruction and Development (IBRD): Lake Qaraoun Pollution Prevention Project (2016-2023)	<p>Objective: reduction of sewage discharge into the Litani River and to enhance pollution management around Qaraoun Lake.</p> <p>Project components:</p> <p>Improvement of municipal sewage collection (IBRD -US\$50.5 million, GoL-US\$5 million)</p> <p>Promotion of Good Agricultural Practices (including Integrated Pest Management) (IBRD-US\$1.5 million) Solid Waste, Water Quality Monitoring, Capacity Building, and Project Management (IBRD-US\$3 million)</p>		<p><u>Complementary</u></p> <p>This project takes care of waste management around the Litani river, thus waste management approach in proposed project is limited</p> <p><u>Non-Duplication</u></p> <p>Focused on waste management</p>
AgriCAL- Climate Smart Agriculture: Enhancing Adaptive Capacity of the Rural Communities in Lebanon (2012-2017)	<p>Goal of the project: increase community resilience and adaptive capacity to climate change in Lebanon</p> <p>Objective: implement climate change adaptation measures in the agriculture sector in three highly vulnerable focus areas:</p> <p>The four outcomes of the project are:</p> <p>Increased water availability and efficient use through water harvesting and irrigation technologies</p> <p>Increased adaptation to climate change for crop production</p> <p>Increased resilience of shepherds and small ruminants to climate change through sustainable rangeland management</p> <p>Climate index insurance initiated, policy influenced, and lessons learned and shared through a knowledge management system</p>	<p>Risk-coping agriculture techniques</p> <p>Initiating a pilot climate insurance index</p>	<p><u>Complementary</u></p> <p>Assist communities in adapting by improving water harvesting and irrigation technologies</p> <p>Introducing adapted crop varieties to future climate condition</p> <p>Spreading awareness of expertise and skills</p> <p>Will be further consulted</p> <p><u>Non-Duplication</u></p> <p>Increase community resilience and adaptive capacity to climate change</p>
UPLoAD, APIEU and Bekaa Water Establishment - Integrated approach for dealing with the water/urbanization problématique through the case of the city of Zahle and the Bedawni river watershed.	<p>The idea is that in Lebanon there is little articulation - institutionally and scientifically - between urbanization management concerns (mainly defined in terms of urban development and land use management and led by local authorities) and water management concerns (mainly defined in terms of engineering adequacy of water resources and water demands and led by regional water establishments). This is problematic as, on one hand, urbanization and urban development have impacts on water flows, consumption and pollution. On the other hand, water resources are historically appropriated as local resources and integrated into local development initiatives (in agriculture, tourism and industry) and there is clear resistance to give its management to a sectorial supra-local authority (regional water establishment) especially as this authority does not concern itself with local development issues.</p> <p>In this context, their approach works on:</p> <p>Building a platform of stakeholders (including water sector actors (Bekaa Water Establishment, Ministry of Energy and Water, Litani River Authority), Zahle municipality, representatives of the</p>	<p>Ongoing (year two of project);</p> <p>Very limited budget funded;</p> <p>Difficult coordination with water stakeholders in the Bekaa region;</p> <p>Enlargement of water management scale to encompass different surrounding regions, since the watershed is common for other regions;</p> <p>Working through municipalities to enhance efficient climate resilient interventions within the municipal boundaries.</p>	<p><u>Complementary</u></p> <p>Water management</p> <p>WASH service delivery</p> <p>Agriculture and urbanization trends in Central Bekaa</p> <p><u>Non-Duplication</u></p> <p>Masterplan for Zahle</p>

	<p>industrial, agricultural and commercial sectors, etc.) where these issues are discussed and possibly information shared.</p> <p>Developing a number of synthesis studies that help understand the context.</p> <p>Working with the urban planning consultant mandated by the municipality of Zahle to draw its new Masterplan (including urban development orientations and land use zoning) to allow him to integrate the results of the studies (in 2)) in his Masterplan and sensitize him to water-sensitive urban planning and design approaches (including "ville perméable" and "sponge city" approaches)</p> <p>Through a participatory workshop, identify with stakeholders' possible projects/initiatives that would enhance urban water management in the city of Zahle</p> <p>Based on the workshop results and available funds develop a pilot project or prepare feasibility studies that could serve other projects</p>		
<p>ReWater MENA managed by the International Water Management Institute and funded by SIDA</p> <p>http://rewater-mena.iwmi.org/</p>	<p>Regional project researching and promoting a safe reuse of treated wastewater in Lebanon, Egypt and Jordan.</p> <p>In Lebanon, it has three main components:</p> <p>A study assessing the Wastewater reuse potential at national level to inform government and decision makers on where and how wastewater can be reused and the associated constraints (technical, social, financial, institutional)</p> <p>Two specific studies around two respective WWTPs where reuse models will be designed in a participatory approach involving stakeholders at all levels. The outputs will be two models (technical, economic and management plans) ready to be physically implemented by the Government and donors. The Rewater MENA won't be implementing infrastructure.</p> <p>Support to the Lebanese Government in developing legal standards for wastewater reuse, based on the FAO Lebanese guidelines (2010). This is currently being done within a committee recently formed by LIBNOR which consists of different relevant ministries and other stakeholders (the meetings started in September 2019).</p>	<p>Designing a wastewater reuse system is a complex endeavor as it entails a diversity of technical, environmental, economic, social and institutional factors.</p> <p>It should be carefully designed with the different stakeholders, especially plant operators and users. It should be guaranteed that The WWTP will continue operating, that water is of sufficient quality, that water is needed and wanted by farmers, that the system is economically feasible and socially accepted. Different scenarios of geographic allocation should be considered and assessed with farmers themselves.</p> <p>If not, there is a risk that infrastructure won't be used.</p> <p>It also has to be politically accepted by the water administration.</p> <p>For example, the Litani River Authority did not want to use treated water in their irrigation systems.</p>	<p><u>Complementary</u></p> <p>Adopting wastewater reuse guidelines especially in the target area</p> <p>Benefiting from existing coordination platforms</p> <p><u>Non-Duplication</u></p> <p>Applying wastewater reuse projects for both irrigation and crop improvement</p>
<p>ELARD and UNDP – Provision of Services for the Development of Local Level Master Plans and Detailed Urban Plans in the Qaraoun Catchment. Draft Master Plan Report (April 3, 2019).</p>	<p>Based on the National Physical Master Plan for the Lebanese Territory recommendations, as well as on the detailed diagnostic of the study area that was prepared during the first phase of the project, this Master Plan for the Districts of Zahle, West Bekaa and Rachaya addresses challenges to be addressed at several levels including landscape, heritage and environmental, urban development structure, as well as economic development challenges.</p>	<p>No industrial activities in core zone</p> <p>New Urbanization not allowed</p> <p>Heavy industries to be relocated far from residential and agricultural areas</p> <p>The masterplan which is in line with the National Physical Master Plan for the Lebanese Territory (NPMPLT) classifies the study area into four zones: A (Agricultural), U (Urban), N1 (Peaks: high mountain above 1900m), and N3 (Valleys, quality forests and continuous ecological areas)</p>	<p><u>Complementary</u></p> <p>Continuation of the mapping exercise especially in landscapes and heritage, natural hazards, urban infrastructure and economic development challenges</p> <p><u>Non-Duplication</u></p> <p>Thorough studies on soil, land use, hydrogeology water sheds and climate related effects on various sectors</p>

G. Learning and knowledge management

One of the main objectives of the project is to promote KM / learning between Jordan and Lebanon, but also beyond, also with the purpose to replicate and upscale demonstrated adaptation approaches and techniques. This is mostly done through a dedicated project KM / learning component 4.

As component 4 will be mostly executed by UN-ESCWA, learning will be promoted through their Arab Centre for Climate Change Policies ([ACCCP](#)) and existing [-RICCAR Arab Regional Knowledge and information hub on climate data and analysis](#).

At the regional / international level, learning/knowledge will be managed and promoted through the creation of a community of practice (CoP) on gender-sensitive climate change in urban areas hosting displaced communities (with implications of the Syrian crisis) (with documentation of good practices and lessons; replication package; project baseline and results video; etc.). The ACCCP is established pursuant to resolution 329 adopted at the 30th ESCWA Ministerial Session (Beirut, 28 June 2018) with the aim to strengthen the capacity of Arab States to better understand and address the implications of climate change for sustainable development in the Arab region.

The Virtual CoP will be established as one of the regional nodes of RICCAR targeting cities to serve as a working group of policy-makers, practitioners and researchers to increase the understanding and knowledge sharing about mainstreaming of gender-sensitive climate adaptation mainstreaming within municipal planning, taking into consideration displacement aspects. The CoP will contribute to the design, test and evaluating the impact of "the urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities" resulting from this project. It will also enhance the networking, communication and coordination between urban climate action practitioners, policymakers, researchers, funders, and the communities-at-risk. Membership of the CoP will be open for all city officials (mainly 3RP countries but other cities with similar contexts in the Arab region could join), key global and regional stakeholders responsible for planning, and implementing climate change adaptation related issues. The CoP will be an open-access knowledge platform displaying developed resources and technical tools. It will include a free membership-based space for dialogue and interaction among members of the CoP. The CoP will also connect with other relevant platforms and databases relevant to urban climate action as well as the Planners for Climate Action and the 3RP platform. The core partners of the CoP will be the members of the regional SC of the project. The regional SC will act as secretariat of the CoP, feeding it with technical inputs, driving its activities and priority themes. The CoP, being part of a regional knowledge hub, could also host technical materials and capacity development opportunities shared by members of the CoP for further enhancement of knowledge about climate change adaptation mainstreaming in municipal planning and to promote a dialogue with other cities in the region regarding these important issues.

Sharing of lessons will also be done through regional / international seminars organised by UN-ESCWA (e.g. Arab water weeks, Arab Ministerial Water Councils, Regional Preparatory Meeting on Climate Change) and international events (e.g. (AMFHUD, WUF, COP side events (2x): AFSD; HLPF 2022 reviewing SDG 11 and 6 and HLPF 2023). Proceedings and contribution of the project to these events will be documented and displayed on the CoP platform.

At the national level (in and between Jordan and Lebanon), learning / knowledge will also be managed and promoted through UN-ESCWA. This will be done through regional SC meetings (where possible organised at the same time as UN-ESCWA organised regional / international seminars) and a platform/working space for communication and sharing lessons regarding the project (research; project best practices and lessons learned). Field visits to project sites will also be organised.

At the district / municipal level, learning / knowledge will be managed and promoted by a consultancy firm, UN-habitat in coordination with universities and execution entities. Geo-referenced databases and an online platform will be used to share project data produced + territorial observatories (by universities) in the target areas. The consultancy firm will also develop the 'regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities.

For output 5.2, “Jordan and Lebanon KM with focus on project progress, best practices and lessons learned”.

[illegible]

- Organize City-to-City exchange in and between Jordan and Lebanon to share lessons learned of the implementation of the project components 1, 2 and 3, and facilitate peer-to-peer learning and cross-fertilisation among city officials but also vulnerable groups of women, youth and displaced to share and disseminate information about their newly developed skills and innovative climate adaptation measures implemented in the project.
- Undertake and exchange exploratory field visits for city officials of the project sites in the target cities of both countries of the project to learn from good practices implemented there and engage them in city dialogues on climate change adaptation in urban settings.

For output 5.3, "Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities"

- A Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities will be defined with key monitoring indicators to better assess the efficiency and effectiveness of the proposed approach, taking into account climate change related urban water scarcity challenges. The model will be discussed by the CoP, presented in online webinars for further refinement and endorsement.
- Develop online modules to translate the model into actionable steps easy to understand and implement by City officials with similar context. The modules will be made available on the online knowledge platform for further dissemination beyond the project timeframe.
- Participation of project partners in relevant international and regional events related to climate change adaptation, and displacement, as needed for promoting and disseminating the model, and for learning from other similar projects and approaches on-going in other Arab countries or in other regions.

For output 5.4, "Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities"

- Development of incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities and publish and share it with other relevant cities in Jordan through the city-to-city exchanges for further replication.

At the national level (in and between Jordan and Lebanon), learning / knowledge will also be managed and promoted through UN-ESCWA. This will be done through regional SC meetings (where possible organised at the same time as UN-ESCWA organised regional / international seminars) and a platform/working space for communication and sharing lessons regarding the project (research, project best practices and lessons learned). Field visits to project sites will also be organised.

At the district / municipal level, learning / knowledge will be managed and promoted by a consultancy firm. UN-habitat in coordination with universities and execution entities. Geo-referenced databases and an online platform will be used to share project data produced + territorial observatories (by universities) in the target areas. The consultancy firm will also develop the 'regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities.

At the community level, project beneficiaries will be involved through a participatory assessment, planning approach (comp 1) and capacity and skills building (comp 2) to operate, maintain and replicate the proposed concrete adaptation techniques being developed under comp 3. Moreover, capacities of government officials, mostly at the municipal level, but also at the national level, will be strengthened to operate, maintain techniques and replicate these, as well as approaches.

Knowledge sharing tools to be used include websites, including existing platforms, social media streams (e.g. Facebook), outreach and information sessions, presentations and a project video, but also produced strategies, plans and guidelines.

Lessons learned, especially what worked and what did not, will be captured through monitoring of all project sub-interventions, also to identify what worked and what not. This would then feed into replication / upscaling guidelines, which will be developed for all sub-interventions (under component 2). All info will feed into output 4.3, the development of a Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities. Field visits will also show what worked and what will not.

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Table 15: Learning and knowledge management

Expected Concrete Outputs	Learning objectives – (lo) & indicators – (i)	Outputs / knowledge products
Outputs 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan	(lo): To use strategies and plans to better plan municipal assets, esp water (taking into consideration both climate change and DPs migration) (i): Number of plans; number of trainings	– Territorial planning and development strategy / guidelines, incl. toolkit on mainstreaming climate change and DPs considerations in land use planning to address water issues in type 2 cities – Urban master plans and investment plans (+ feasibility assessments) – Target areas climate change vulnerability profiles – Training reports
Output 2.1. Community organisation, awareness and capacity / skill building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9	(lo): Build community and vulnerable groups capacities and skills to operate, maintain and replicate / upscale resilient water systems; identify best way to reduce (potential) tension between groups (i): Number of plans; number of trainings	– Operation, maintenance and replication plans for all sub-projects, including highlighting what worked and what did not – Training toolkits for building capacities at the community level – Training reports
Output 3.1. Rooftop rainwater harvesting in Lebanon 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.4. Efficient treatment and reuse of wastewater in Lebanon 3.5. Efficient treatment and reuse of wastewater in Jordan 3.6. Water-use efficient irrigation of treated wastewater in Lebanon 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration – closed loop water system in Jordan 3.9. Permaculture demonstration – closed loop water system in Lebanon	(lo): showcase best practice information on replicable innovative techniques / interventions in context of high influx of DPs and climate change impacts (i): Number of techniques / interventions showcased	– Techniques / interventions documented, including what worked and what did not highlighted. This will feed into the replication / upscaling guidelines (component 2) and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities (component 4)
Output 4.1. Regional / international KM with focus on sharing project lessons and replication 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	(lo): Share lessons on how to address climate change impacts in type 2 cities context (i): Number of knowledge products and events on which lessons will be shared	– Community of practice on climate change in urban areas – Presentations and knowledge sharing materials at international conferences – KM platforms – Project video – Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities – Documented proposed incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities

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One of the main objectives of the project is to promote KM / learning between Jordan and Lebanon, but also beyond, also with the purpose to replicate and upscale demonstrated adaptation approaches and techniques. This is mostly done through a dedicated project KM / learning component 4.

As component 4 will be mostly executed by UN-ESCWA, learning will be promoted through their Arab Centre for Climate Change Policies and existing KM platform.

At the regional / international level, learning / knowledge will be managed and promoted through the creation of a community of practice on climate change in urban areas (with implications of the Syrian crisis) (with documentation of good practices and lessons; replication package; project baseline and results video; etc.). Sharing of lessons will also be done through regional / international seminars organised by UN-ESCWA (e.g. Arab water weeks, Arab Ministerial Water Councils, Regional Preparatory Meeting on Climate Change) and international events (e.g. AMFHUD, WUF, COP side events (2x); AFSD; HLPF 2022 reviewing SDG 11 and 6 and HLPF 2023).

At the national level (in and between Jordan and Lebanon), learning / knowledge will also be managed and promoted through UN-ESCWA. This will be done through regional SC meetings (where possible organised at the same time as UN-ESCWA organised regional / international seminars) and a platform/working space for communication and sharing lessons regarding the project (research; project best practices and lessons learned). Field visits to project sites will also be organised.

At the district / municipal level, learning / knowledge will be managed and promoted by a consultancy firm. UN-habitat in coordination with universities and execution entities. Geo-referenced databases and an online platform will be used to share project data produced + territorial observatories (by universities) in the target areas. The consultancy firm will also develop the 'regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities.

At the community level, project beneficiaries will be involved through a participatory assessment, planning approach (comp 1) and capacity and skills building (comp 2) to operate, maintain and replicate the proposed concrete adaptation techniques being developed under comp 3. Moreover, capacities of government officials, mostly at the municipal level, but also at the national level, will be strengthened to operate, maintain techniques and replicate these, as well as approaches.

Knowledge sharing tools to be used include websites, including existing platforms, social media streams (e.g. Facebook), outreach and information sessions, presentations and a project video, but also produced strategies, plans and guidelines.

Lessons learned, especially what worked and what did not, will be captured through monitoring of all project sub-interventions, also to identify what worked and what not. This would then feed into replication / upscaling guidelines, which will be developed for all sub-interventions (under component 2). All info will feed into output 4.3. the development of a Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities. Field visits will also show what worked and what will not.

Table 15: Learning and knowledge management

Expected Concrete Outputs	Learning objectives (lo) & indicators (i)	Outputs / knowledge products
Outputs 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan	(lo): To use strategies and plans to better plan municipal assets, esp water (taking into consideration both climate change and DPs migration (i): Number of plans; number of trainings	- Territorial planning and development strategy / guidelines, incl. toolkit on mainstreaming climate change and DPs considerations in land use planning to address water issues in type 2 cities - Urban master plans and investment plans (+ feasibility assessments) - Target areas climate change vulnerability profiles - Training reports
Output 2.1. Community organisation, awareness and capacity / skill building + operation,	(lo): Build community and vulnerable groups capacities and	- Operation, maintenance and replication plans for all sub-projects,

maintenance and replication and upscaling plans for concrete adaptation output 3.1 2.2. See above for output 3.2. 2.3. See above for output 3.3. 2.4. See above for output 3.4. 2.5. See above for output 3.5. 2.6. See above for output 3.6. 2.7. See above for output 3.7. 2.8. See above for output 3.8 2.9. See above for output 3.9	skills to operate, maintain and replicate / upscaleresilient water systems; identify best way to reduce (potential) tension between groups (i): Number of plans; number of trainings	including highlighting what worked and what did not - Training toolkits for building capacities at the community level - Training reports
Output 3.1. Rooftop rainwater harvesting in Lebanon 3.2. Rooftop rainwater harvesting in Jordan 3.3. Greywater treatment and reuse in Jordan 3.4. Efficient treatment and reuse of wastewater in Lebanon 3.5. Efficient treatment and reuse of wastewater in Jordan 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon 3.7. Water-use Efficient irrigation of treated wastewater in Jordan 3.8. Permaculture demonstration - closed loop water system in Jordan 3.9. Permaculture demonstration - closed loop water system in Lebanon	(lo): showcase best practice information on replicable innovative techniques / interventions in context of high influx of DPs and climate change impacts (i): Number of techniques / interventions showcased	- Techniques / interventions documented, including what worked and what did not highlighted. This will feed into the replication / upscaling guidelines (component 2) and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities (component 4)
Output 4.1. Regional / international KM with focus on sharing project lessons and replication 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	(lo): Share lessons on how to address climate change impacts in type 2 cities context (i): Number of knowledge products and events on which lessons will be shared (i): % increased knowledge of stakeholders of the CoP on gender sensitive climate adaptation in cities hosting refugees	- Community of practice on climate change in urban areas - Presentations and knowledge sharing materials at international conferences - KM platforms - Project video - Field visits - Online modules - Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities - Documented proposed incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities

H. Consultative process

For the project preparation phase, consultations have been conducted with key stakeholders and beneficiary communities, including representatives from the government, UN agencies, NGO's and vulnerable groups. An overview of consultations conducted, including objective, outcomes and how inputs have been incorporated in the proposal is available in annex 3. Details such as completed consultation questionnaires and attendance sheets are available on request. Four type of consultations shaped this proposal. Consultations to:

- Align with National and sub-national priorities: throughout the project preparation phase, UN-Habitat worked with the AF focal points, ministries mandated to work on aspect touched by the project (i.e. water, agriculture, spatial planning, etc.) and target municipalities. The proposed project activities have been prioritised / selected with these government representatives, as well as the target areas. Both Jordan and Lebanon governments ~~prioritised~~[prioritised](#) water harvesting and wastewater treatment and reuse ~~adaptaion~~[adaptation](#) measures (see annex 3)

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- To avoid duplication with other projects (government, UN agencies, NGOs, etc.) and use lessons learned (see annex 3)
- Identify specific needs and possible concerns of vulnerable groups. In line with AF ESP and GP policies, consultations with beneficiary communities and specific groups (especially women, youth, Syrians) of each sub-project took place to identify specific needs and possible concerns regarding the proposed project activities (see annex 3, 4 and 5).
- Identify potential environmental and social risks and impacts. Related to above and in line with AF ESP and GP policies, consultations took place to identify potential risks and impacts of proposed project activities. This also includes public hearings in line with national requirements for conducting EIA ((see annex 3, 4 and 5).

Table 16: List of stakeholders consulted. For more details, including outcomes, see annex 3

Stakeholder	Leb	Jor	Principle choice for consultation					Method
			To align with government priorities	To avoid duplication with other projects	To comply with standards, rules and regulations	Identify specific needs and possible concerns vulnerable groups	Identify potential environmental and social risks and impacts.	
Ministry of Environment	x	x	x	x	X		x	Private meeting Steering committee
Ministry of Energy and Water	x		x	x	X			Private meeting Steering committee
Council for Development and Reconstruction	x		x	x				Private meeting Steering committee
Bekaa Water Establishment	x		x	x	X			Private meeting Steering committee Execution partner
Litani River Authority	x		x	x	X			Private meeting Steering committee Execution partner
Lebanese Agriculture Research Institute	x		x	x		x		Private meeting Execution partner
Municipality of Zahle	x		x	x	X	x		Private meeting Steering committee
Municipality of Bar Elias	x		x	x	X	x		Private meeting Steering committee
Other target Municipalities	x	x	x	x				Private meeting
Ministry of Planning and International Cooperation		x	x	x				Private meeting Steering committee
Ministry of water and Irrigation		x	x	x	x			Private meeting Steering committee
Ministry of Local Administration		x	x	x				Private meeting Steering committee
The Ministry of Awqaf Islamic Affairs and Holy Places		x	x	x	x			Private meeting Steering committee
Ministry of Education		x	x	x	x			Private meeting Steering committee
WAJ / Yarmouk Water Company		x	x	x	x			Private meeting Steering committee
Municipality of Irbid		x	x	x	x	x		Private meeting Steering committee
Municipality of Mafrq		x	x	x	x	x		Private meeting Steering committee

Uploda	x			x		x		Calls Execution partner
UN-ESCWA	x		x	x		x		Private meeting Execution partner
UNICEF	x	x		x		x	x	Private meeting Execution partner
Johud		x				x	x	Private meeting Execution partner
Badia Fund		x				x	x	Private meeting Execution partner
Permaculture Research Institute		x		x		x	x	Private meeting Execution partner
UN Women	x	x		x		x	x	Private meeting
UNHCR	x	x		x		x	x	Private meeting
UNDP	x	x		x				Private meeting
FAO		x		x				Private meeting
ILO	x	x		x		x	x	Private meeting
OHCHR	x			x		x	x	Private meeting
IUCN	x	x		x		x	x	Private meeting
GIZ	x			x				Private meeting
Norwegian Refugee Council	x						x	Private meeting Community consultations
Solidarites International	x						x	Private meeting
WB	x							Private meeting
Vulnerable groups, including women, youth, Syrians and farmers	x	x				x	x	Focus groups consultations Public hearings

During the pre-concept note development phase, consultations were conducted with the AF focal points and relevant ministries in both countries to ensure project alignment with national priorities (i.e. national strategies and plans). Since then, UN-Habitat staff in both countries continued close coordination with government representatives at the national and municipal level, also through formed steering committees.

During the concept note development phase, consultation were conducted with project beneficiary groups, including vulnerable groups, including through (12) focus group discussions. The consultations aimed to identify the most hazardous climate change impacts on target communities and groups, their barriers to adapt to such impacts, their specific needs and their potential concerns regarding proposed project activities. Vulnerable groups consulted include: Syrian DPs, women, youth, children and disabled people by ensuring their representation in most of the discussions. Whenever possible and acceptable, focus groups with women only followed the main discussions. Some of the community consultations were organised in collaboration with municipalities of Mafraq, Irbid and Zahle and others were organised with support of NGOs and CBOs (i.e. World Vision, Norwegian Refugee Council) working in the target areas.

Workshops with government representatives, academia, etc. were also conducted to identify the main climate change issues, needs and other projects (to avoid duplication) in target municipalities and to further select project activities. Also, "one to one" meetings targeting relevant government institutions, UN agencies, other international organisations and NGOs were conducted.

The outcomes of consultations shaped the selection of proposed interventions at that stage. Some of the proposed interventions were excluded due to cost inefficient (in low density areas), non-feasibility due to e.g environmental risks (e.g groundwater use) and non-preference of beneficiary groups. In some

discussions, new interventions were suggested by the communities (e.g. efficient irrigation techniques). Also, measures will be taken to respond to some concerns raised, especially those of Syrian DPs and women

During the full proposal development phase, accredited consultants to conduct feasibility assessments and environmental and social risks screening and impact assessment were hired in both countries. These consultants followed national requirements to do these assessments (including public hearings), as well as AF requirements (consultations with all beneficiary groups to identify potential risks and impacts, including possible concerns). Complete national feasibility assessment, ESIA-ESMP and consultation reports are available on request. In April 2020, additional consultations have been conducted to identify specific needs and possible concerns and risks regarded to permaculture intervention in Lebanon. This has been done following Covid-19 restrictions for meeting. Meetings were in person but on distance, with various representatives of vulnerable groups and especially farmers. Consultations targeting farmers were completed on field in two areas, at LARI premises and at the Municipality of Zahle. Throughout implementation, beneficiary communities and groups will participate in the works carried through demonstration plots at LARI and on their own plots of farmland. Consultations were done in the form of an online survey through Microsoft Forms (results can be accessed through the following link).

Figure 11: Consultation carried out at LARI premises



Figure 12: Consultation carried out at Zahle Municipality

Figure 113: Lebanon workshop to identify main climate change issues, needs and other projects in target municipalities and to further select project activities. Attendance sheets can be shared on request.



Figure 1214: Jordan workshop to identify main climate change issues, needs and other projects in target municipalities and to further select project activities. Attendance sheets can be shared on request.



Figure 4315: Example of community consultations and women focus groups and representatives in Lebanon



Figure 4416: Example of community consultations and women focus groups and representatives in Jordan



G.I. Justification of funding request

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There is little exploration of how urban systems respond to a rapid influx of new and often long-term residents by conflict combined with climate change impacts. Therefore, it is manifest and critical to build resilient communities and institutions that are equipped to respond to shocks and stresses arising from climate change in combination with displacement. This project explores and collects evidence of approaches and best practice techniques that effectively respond to these challenges faced in urban areas in Jordan and Lebanon.

The project will support implementation of national priorities as well as responding to local needs, especially of the most vulnerable, and will provide added value to national plans and approaches through implementation of innovative technical interventions. The proposed project components also fully align with AF outcome areas. This alignment has resulted in the design of a comprehensive approach to address climate change related water challenges in a type 2 host cities context.

There is a need for concrete adaptation actions in the water sector in the targeted urban areas in Jordan and Lebanon focusing on the most vulnerable groups. Since most Syrians in Lebanon and Jordan work in the water-dependent agriculture sector and have limited access to water, increasing water scarcity, exacerbated by climate change, is a big challenge. The actions are crucial for the urban areas to cope with current and future climate change impacts exacerbated by the influx of Syrian DPs. The Third National Communications to the UNFCCC of Jordan and Lebanon stated clearly that financial constraints are among the barriers to adaptation and that there is a clear need for funding and capacity building to support national and municipal climate action. As mentioned earlier, the target urban areas were selected because of a combination of existing and projected climate change-related water challenges, high pressure on water resources due to high influx of DPs and lacking resources and capacities to address these climate change-related water issues and specific needs of DPs, which includes access to affordable water.

From a regional perspective, the project can be justified by responding to some funding gaps under the regional Syrian crisis response programming (i.e. 3RP), where budget gaps exist, especially under the WASH and the social cohesion and livelihoods components,¹⁰⁰ which is most relevant in 'host' cities (see also annex 1). Besides that, considering the significance of the combined challenges posed by the climate change and the Syrian crisis, regional knowledge exchange and learning is needed, between Jordan and Lebanon, but also in the wider region, which will be done through component 4.

The project aims to maximizing the funding amount for the concrete adaptation component (component 3; USD 7,5 million, which is approx. 2/3 of the sum of the four project components); funding allocation to component 2 is required to operate, maintain and replicate the proposed concrete interventions under component 3. Funding for component 1 is needed to more efficiently assess, plan and manage water at the municipal level, including to identify additional solutions to adapt to climate change.

The table below provides a justification for funding requested, focusing on the full cost of adaptation reasoning, by showing the impact of AF funding compared to no funding (baseline) related to expected project outcomes.

Table 17 Overview of impact of AF funding compared to no funding (baseline) related to expected project outcomes

Project outcomes	Baseline (without AF)	Additional (with AF)	Comment and alternative adaptation scenario's
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¹⁰⁰ 3RP Regional Quarterly Dashboards March 2018. Online: <https://data2.unhcr.org/fr/documents/download/63820>

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1.Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries (in line with AF outcome 1 and 2)	<p><u>In Jordan and Lebanon, water is managed at the national and district scale, by looking also most solely at current demand and supply needs, with limited consideration of climate change and population movement trends.</u></p> <p><u>Most of the response in target areas is still humanitarian; therefore, a sustainable water assessment, planning and management approach is lacking.</u></p>	<p><u>The activities related to this outcome will allow municipal governments to assess, plan and manage climate change and DPs movement related risks and vulnerabilities, especially related to (on-conventional) water, in a participatory, integrated, sustainable and climate change resilient way; and inform national decision-making more efficiently</u></p> <p><u>Displacement and climate change are increasingly important factor driving urban growth trends. Taking into account the scale, scope and impacts of displacement and climate change in the target areas, strategies and master plans will help municipal government to respond to the challenge effectively</u></p>	<p><u>Although municipalities have the mandate to develop these plans, they lack the capacity and financial resources to execute activities related to this outcome without support</u></p> <p><u>Without sustainable and climate change resilient approaches, target areas will become more water scarce, resulting in negative effects for poverty reduction targets and livelihood security and possible tension over scare resources.</u></p> <p><u>Alternatively, water is managed through IWRM approaches, but this is not in line with national priorities / practices</u></p>
2.2Strengthened DPs and host communities awareness and ownership of CC adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building (in line with AF outcome 3 and 8)	<p>Target communities have very limited options (capacity – skills and technically - and financial resources) to protect their people and assets against climate change impacts, especially lack of water.</p> <p>Rising social tensions between host communities and DPs, pose risks and threats to development gains</p>	<p>The activities related to this outcome (combined with outcome 1) will enable communities and vulnerable groups to operate and sustain systems and to assess, plan and manage these together. It will also increase livelihood / income security;</p> <p>Inclusive approaches that promote social cohesion need to be an integral part of displacement responses, especially around scare resources</p>	<p>Communities and vulnerable groups lack the capacities to operate and sustain systems and to assess, plan and manage these together.</p> <p>Without sustainable and climate change resilient water management approaches at community level, target areas will become more water scarce, resulting in negative effects for poverty reduction targets and livelihood security and possible tension over scare resources.</p> <p>Alternatively, livelihoods could be diversified more, but as water is an urgent issue, this has been prioritized.</p>
3.4Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context and benefitting vulnerable groups (in line with AF outcome 4 and 6 and 8)	<p>Municipal governments invest very little in sustainable and climate change resilient urban water services, considering most cities in Jordan and Lebanon are already suffering from inadequate service provision and overextraction and pollution of groundwater.</p> <p>Displacement and climate change exacerbate the situation by adding extra pressure on services, often becoming a source of tension with discontent and competition around services.</p>	<p>The activities related to this outcome will increase the sustainability and climate change resilience of water-related services and livelihoods dependent on water in and around the target municipalities. Taking into consideration the DP and climate change context, techniques selected can be replicated in similar context areas.</p>	<p>Top-down proposed interventions have the risk of not being community driven and appropriate and will also not respond to the situation. The interventions selected respond to larger water system challenges, especially overextraction of groundwater and water pollution, which pose health risks and livelihood security challenges.</p> <p>Alternative adaptation scenarios are ad hoc humanitarian responses, which would respond to urgent needs, but not in a sustainable and climate change resilient way.</p>

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4.41.1. Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally (in line with AF outcome 3 and 8)	National governments in the Mashriq region have limited capacity and knowledge about available models, tools, techniques + limited financial resources to respond to the combined challenges of climate change and displacement, especially in urban areas.	The activities related to this outcome will allow governments in the region, including at the municipal level, to replicate the approach / model and best practice adaptation interventions to respond to a combination of high DP influx (i.e. type 2 cities) and climate change challenges	Without activities related to this outcome, there is a risk that interventions won't be replicated and sustained and demand for adopting similar approaches is not generated; and high-level and international support and engagement for the proposed approach is not mobilized.
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Sustainability

The adaptation benefits achieved through the project will be sustained after its end, and replication and scaling-up options promoted through other (potential) funds after its end, especially through component 4. Sustainability and maintenance arrangements for concrete adaptation interventions (comp 3) are laid-out in table 18 below, as well as those for strategies and plans developed under comp 1 and capacities build under comp 1 and 2. Knowledge produced will be shared through comp 4.

At the regional level, project learning and replication and upscaling of outcomes will be promoted through comp 4, which includes knowledge and learning exchange between Jordan and Lebanon and the larger region. At the national level, the project will be sustained through the strong linkages of the proposed project activities with national and sub-national priorities (ensuring national buy-in). At the local level, the full engagement of communities and vulnerable groups in project activities, including assessments, planning and decision-making processes, should achieve building of communities' awareness and capacities and furthermore ownership and leadership in the area of water management – see component 1 and 2. Specific emphasis is given to community capacity strengthening to operate, maintain and replicate the systems (including the development of operation, maintenance and replication plans). Also, through the participatory approach, the project activities aim to contribute to avoid potential future tension over scarce resources. With all four components, the project aims to support sustainable development in target areas in Jordan and Lebanon and the wider region, compared to a currently humanitarian / emergency driven approach.

Institutional sustainability: the project paves the way for the Jordan and Lebanon national and municipal governments, but also other governments in the region, to replicate and up-scale the project through the development of best practices assessment, planning and management approaches (comp 1) and best practices concrete adaptation measures, that will be shared regionally under comp 4. Trainings of government staff, especially at the municipal level, will be conducted to strengthen relevant government capacities to deliver and sustain project activities. This would include conducting climate change vulnerability assessments, resulting in target area climate change vulnerability profiles with specific data that should be collected when iterations of municipal plans take place (which is mandatory by law). Part of the detailed project activities under this component (see Part II.A) is the support of a monitoring system with required indicators. Besides that, UNESCWA and Riccard are developing localised climate change scenarios and vulnerability profiles, which would be matched with data from the ground in the target areas. Based on the assessments conducted, responses to the most critical climate change hazards, especially droughts and floods (and other issues identified) can be formulated and prioritised. Through the master plan, responses can be shown spatially. This means e.g. avoiding development in high risk areas or planning concrete interventions to reduce specific identified risks and vulnerabilities.

Social sustainability: by organizing and fully engaging community members and vulnerable groups in project activities, including assessments and planning processes during project preparation and implementation, the project aims to achieve long-lasting awareness and capacities of community members.

Economic sustainability: investing in increasing the resilience of vulnerable assets is a sustainable economic approach. It will avoid future costs related to drought / water scarcity and flood impacts, especially on the vulnerable agriculture sector.

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Environmental Sustainability: the proposed project interventions support environmental sustainability by reducing the use overextracted groundwater resources and reduce pollution of water, including of streams and irrigation channels.

Financial sustainability: the proposed interventions are fully aligned with national and sub-national priorities and programmes and therefore, the government actively supports the project and interventions, including anchoring it to existing programmes and monitoring frameworks.

Technical sustainability: techniques used are innovative in the target areas but through operation and maintenance plans and the need to adopt such techniques, also identified in national priorities, sustainability will ensured.

Maintenance arrangements for the wastewater treatment plants

Jordan:

The Government of Jordan (GoJ) is the only entity in Jordan authorized by law to manage and deliver water and wastewater services in the country either through the central Ministry of Water and Irrigation (MoWI)/Water Authority of Jordan (WAJ) or through its daughter companies in charge of such services in certain governorates. Yarmouk Water Company (YWC) is a national limited liability company wholly owned by MoWI/WAJ, which was established on 26/7/2010 for the management of water and wastewater in the four governorates of North Sector of Jordan (including the three governorates of Irbid, Mafrqa, and Jerash where the three WWTP facilities of this project are located) in accordance with the provisions of the Jordanian Companies Law No (22) of 1997. YWC is managed and supervised by a board of directors consisting of (7) members, which is responsible to the General Assembly.

Realizing the big need to utilize treated wastewater for irrigation to ease the stress on freshwater resources in the country (only 265 cubic meter per year (about 56 cubic meters per year per capita considering the average size of the Jordanian family is 4.7 according to Department of Statistics-DOS), the Government of Jordan allocates constant share of financial resources for water and wastewater services in the state's annual budget, where the latter is enacted by a law annually voted on by the Parliament, which sets allocation for the year on hand and forecasts estimate budgets for the following two years to come. YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project where certain amount of the allocation is particularly set to maintain the quality of treated water to meet the incumbent standard.

▲ For example, the 2020 State Budget of Jordan, which was approved in January 2020, allocated for MoWI/WAJ under Section 8102 (attached in Arabic) a total of 364,168,000 JOD (= 513,642,576 United States Dollars) for 2020 and forecasted approximated budgets for the years 2021 and 2022. The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD). The breakdown for each specific WWTP of the three WWTPs of this project is provided on page 5. Such allocations cover all aspects of running constant O&M costs as well as new activities (expansion, ad-hoc, emergency burdens, etc).

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▲ Thus, the GoJ is committed to finance permanently the O&M and sustainability of the water and wastewater services in the country through an institutionalized state budget. However, when water and wastewater authorities in Jordan receive financial aid from donors or grants, such as the AF's grant, that support is utilized to institutionalize the process of serving the objectives of that aid and augmenting the tailored end products (adaptation measures in this case) sought from the intervention of that extra support while maintaining covering the costs of business as usual operations from the state budget. Such newly institutionalize measures become then part of the business as usual operations. As per the details of the proposed wastewater treatment-related activities under this project, as can be seen in the detailed budget, maintenance requirements have also been considered in terms of providing required equipment for this.

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Lebanon

The Ministry of Energy and Water in Lebanon (MoEW) is the only entity in Lebanon authorized by law to manage and deliver water and wastewater services in the country either through the four regional Water Establishments and/or the Litani River Authorities as per Law 221/2000 and all its related

~~ammendments~~amendments. As for agricultural water services, they fall under the management of Ministry of Agriculture through the Lebanese Agricultural Research Institute (LARI).

Since water is not properly metered across Lebanon, customers connected to the water network do not pay based on the amount of water they use. 300,000 LBP (around \$200) are paid on a yearly basis for a municipal water supply of 1 m³/d. However, due to intermittent supply, this quantity is not actually supplied. Since public buildings have a high demand of water, their subscription would be more than 1 m³/d. As for the water sourced from external suppliers during dry periods, the cost of water is approximately 25,000 LBP (around \$17) for 2 m³ of water. Moreover, a small fee was recently added to the yearly fee paid by residents for wastewater connection to the network. Water Establishments rely on the applied yearly tariffs to operate and maintain the infrastructure.

Today in Central Bekaa, the operated Zahle WWTP currently discharges the treated effluent—which was deemed to be useful for irrigation—in the Litani river without making any agricultural or financial benefit. Hence, the CCAF proposal for Lebanon aligns with the *Water Sector Crisis Response Plan* (sustainable approach/plan to treatment plants) currently being developed by the MoEW and which stresses on administering proper tariffs, increasing the number of subscribers (which goes hand in hand with awareness raising campaigns and close community consultations) and training the Water Establishments' skilled staff to properly operate and maintain treatment plants across the country.

All proposed interventions of the permaculture project do ensure sustainability either through personal initiatives or through external funding resources. For instance, at the farmers' level the approach suggested/to be adopted is designed in a way to self-sustain. Water harvested for irrigation, reuse of agricultural waste (pruning twigs from vines and fruit trees, among other farm wastes ...), techniques for self-made biofertilizer production, among all the other suggested approaches in the adaptation measure's description. Also, and as part of the proposal, training sessions will be conducted on all beneficiaries which would include information on proper evaluation, monitoring and maintenance.

As for the educational facility, LARI/ Ministry of Agriculture will establish a coordination between the Ministry of Education and Higher Education and the Lebanese University to ensure its long-term sustainability.

As per the details of the proposed wastewater treatment-related activities under this project, as can be seen in the detailed budget, maintenance requirements have also been considered in terms of providing required equipment for this.

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Table 18: Project activities' sustainability and maintenance arrangements, including replication and upscaling

Detailed outputs / activities	Maintenance measures	Responsible	Replication + Upscaling measures	Responsible
Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration				
▲ Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon)	Below municipal staff will be involved and trained, as well as appointed staff form higher level planning authorities to develop the strategies and guidelines for replication and to embed these in national government processes, including monitoring framework and indicators to be used	Planning: Un-H with a consultancy firm Implementation/after project: target district; Ministry of Interior and Municipalities (MoIM), Ministry of Public Works (MoPW), Ministry of Energy and Water (MoEW), Ministry of Environment (MoE), Ministry of Agriculture (MoA).	Replication at other districts, informing area-based planning to the Directorate General of Urban Planning (under the MoPW)	Line Ministries
▲ Urban master plans at municipal level with climate change and gender mainstreamed (Lebanon)	As municipalities are mandated to develop master plans and to manage water within municipal boundaries, dedicated staff will be appointed and trained to deliver and sustain project activities, including through a monitoring framework and indicators to be used. <u>For the Urban observatories, focal points of the Urban observatory (one regional) will be appointed and annual municipal budgets will be dedicated for O & M.</u>	Planning: Un-H with a consultancy firm Implementation/after project: target district; Ministry of Interior and Municipalities, Ministry of Public Works, Ministry of Energy and Water, Ministry of Environment.	Replication at other Municipal levels of the district. Informing Municipal strategic planning to the MoIM	Line Ministries
▲ Urban master plans at municipal level with climate change and gender mainstreamed (Jordan)	As municipalities are mandated to develop master plans and to manage water within municipal boundaries, dedicated staff will be appointed and trained to deliver and sustain project activities, including through a monitoring framework and indicators to be used. <u>For the Urban observatories, focal points for each municipality have already been appointed and annual municipal budgets have been dedicated for O & M.</u>	Planning: Un-H with Consultancy Firm Implementation: target municipalities; Ministry of Local Administration;	Replication across all remaining municipalities	Line Ministries
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context				
▲ Rooftop rainwater harvesting in Lebanon	Under comp 2. Output 1 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: UNICEF/ Lebanese Agriculture Research institute (LARI under MoA) After project end: Buildings owners and Municipalities	Through the Municipal zoning and building permits	Municipalities
▲ Rooftop rainwater harvesting in Jordan in	Under comp 2. Output 2 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings	During implementation: JOHUD After project end: Ministry of Education and Ministry of Awqaf Residential Building owners	Applying similar interventions to other schools,mosques and residential buildings. Initiate a national programme in collaboration with MoLA to enforce the installation of RWH at household level through building licences and permits. Financial incentive mechanism to support the scaling up of the project.	Directorate of Education: Building Department Ministry of Awqaf: Construction and Maintenance Department
▲ Greywater treatment and reuse in buildings in Jordan in	Under comp 2. Output 3 Operation, maintenance and replication plans	During implementation: UNICEF After project end: Ministry of Education and Ministry of Awqaf	Applying similar interventions to other schools and mosques	Directorate of Education: Building Department

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	Awareness raising campaigns and capacity development trainings			Ministry of Awqaf: Construction and Maintenance Department
Efficient treatment in and reuse of wastewater from Zahle WWTP, Lebanon	Under comp 2. Output 4 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from regional water establishment (Bekaa Water Establishment) Allocated maintenance budget for the canal from Zahle municipality	During implementation: The Regional Technical Office (RTO), Litany River Authorities (LRA), Bekaa Water Establishment (BWE) After project end: BWE (mandated to operate and maintain WWTP after being handed over by the Council for Development and Reconstruction CDR), Zahle Municipality	Through applying similar interventions to other WWTP	BWE, MoEW
Efficient treatment in and reuse of wastewater from Bar Elias wetlands, Lebanon	Under comp 2. Output 4 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from the Litany River Authorities (LRA)	During implementation: LRA, UNICEF After project end: LRA	Through applying wetlands on Litany river course	LRA
Efficient treatment in and reuse of wastewater from Mafrq WWTP, Jordan	Under comp 2. Output 5 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from national government and maintenance equipment provided The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD).	During implementation: MoWI/YWC After project end: YWC YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project	Ensure reclaimed water remains of high quality and up to Jordanian Standards: Law No. (22) of 1997	YWC
Efficient treatment in and reuse of wastewater from Maerad WWTP, Jordan	Under comp 2. Output 5 Operation, maintenance and replication plans Awareness raising campaigns and capacity development trainings Allocated maintenance budget from national government and maintenance equipment provided The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD).	During implementation: MoWI/YWC After project end: YWC YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project	Ensure reclaimed water remains of high quality and up to Jordanian Standards: Law No. (22) of 1997	YWC
Efficient treatment in and reuse of wastewater in Akaidr WWTP, Jordan	Under comp 2. Output 5 Operation, maintenance and replication plans	During implementation: MoWI/YWC After project end: YWC YWC, through MoWI/WAJ, receives its annual allocation of the budget, which include named sub-allocation for operation and	Ensure reclaimed water remains of high quality and up to Jordanian Standards: Law No. (22) of 1997	YWC

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	<p>Awareness raising campaigns and capacity development trainings</p> <p>Allocated maintenance budget from national government and maintenance equipment provided</p> <p>The allocation for sewage management and all other related activities for YWC for the Northern Governorates is for 2020 set under Program number 8006 with a total of 8,650,000 JOD (= 12,200,435 USD).</p>	<p>maintenance of all Wastewater Treatment Plants (WWTPs) under its mandate including the three WWTPs of this project</p>		
Water-use-efficient irrigation of treated wastewater from Zahle WWTP, Lebanon	<p>Under comp 2. Output 6</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: RTO, Zahle Municipality</p> <p>After project end: Farmers and Municipality</p>	Through irrigation masterplans	LARI, MoA, Zahle Municipality Farmers Cooperatives
Water-use-efficient irrigation of treated wastewater from Bar Elias wetlands, Lebanon	<p>Under comp 2. Output 6</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: RTO, Bar Elias Municipality</p> <p>After project end: Farmers and Municipality</p>	Through irrigation masterplans	LARI, MoA, Bar Elias Municipality Farmers Cooperatives
Water-use-efficient irrigation of treated wastewater from Mafrq WWTP, Jordan	<p>Under comp 2. Output 7</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: BADIA Fund</p> <p>After project end: Farmers</p>	Through irrigation masterplans	Members of the Water Association
Water-use-efficient irrigation of treated wastewater from Maerad WWTP, Jordan	<p>Under comp 2. Output 7</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: JOHUD</p> <p>After project end: Farmers</p>	Through irrigation masterplans	Members of the Water Association
Water-use-efficient irrigation of treated wastewater from Akaidr WWTP, Jordan	<p>Under comp 2. Output 7</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: JOHUD</p> <p>After project end: Farmers</p>	Through irrigation masterplans	Members of the Water Association
Permaculture demonstration – efficient use of water	<p>Under comp 2. Output 8</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: PRI in cooperation with JUST</p> <p>After project end: PRI in cooperation with JUST</p>	Landscape rehabilitation plan(s) by students and PRI team for surrounding areas, including technical replication guidebook (under comp 2); Permaculture site at JUST will function as a 2 nd PRI regional demonstration site	PRI in cooperation with JUST
Permaculture demonstration – efficient use of water in Lebanon	<p>Under comp 2. Output 9</p> <p>Operation, maintenance and replication plans</p> <p>Awareness raising campaigns and capacity development trainings</p>	<p>During implementation: LARI in cooperation with municipalities, MEHE, farmers, and UN-Habitat</p> <p>After project end: LARI in cooperation with municipalities, MEHE, farmers, insert</p>	<p>Landscape rehabilitation plan(s) by students and LARI for surrounding areas, including technical replication guidebook (under comp 2);</p> <p>Permaculture sites at LARI will continue to function as a national demonstration site insert</p>	<p>insert LARI and municipalities</p>

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Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)				
Regional / international KM with focus on sharing project lessons and replication	Knowledge will be embedded and shared through the UN-ESCWA <u>Arab center for climate change policies</u> knowledge hub, which is sustained by UN-ESCWA already. The project will feed into refugee response plans in the region	UN-ESCWA + Un-Habitat	This component is specifically designed to share all project lessons (above), also with the purpose to replicate and upscale these. Therse this component can be regarded as part of the replication and upscaling mechanism for the the project activities.	UN- Habitat Habitat in cooperation with UN-Escwa and other key stakeholders
Jordan and Lebanon KM with focus on project progress, best practices and lessons learned	National knowledge sharing will also be sustained through UN-ESCWA	UN-ESCWA + Un-Habitat Ministries of Environment		
Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Knowledge will be embedded and shared through the UN-ESCWA <u>Arab center for climate change policies</u> knowledge hub, which is sustained by UN-ESCWA already. The project will feed into refugee response plans in the region	UN-Habitat in cooperation with a consultancy firm and municipalities and universities	This will be done through the UN-ESCWA <u>Arab center for climate change policies</u> knowledge hub, which is sustained by UN-ESCWA already.	
Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities		UN-Habitat in cooperation with ministries		

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risks

The proposed project seeks to fully align with the Adaptation Fund's Environmental and Social Policy (ESP), and its 15 safeguard areas, Gender Policy (GP), Further to Part II.F above on compliance with national technical standards, outlined below is a summary of the findings of the initial screening process to identify and evaluate potential environmental and social risks and impacts of proposed project actions, and based on that, of the entire project. With this information, the entire project has been categorized. As shown in section II.I and annex 3 and 4, consultations have been conducted to identify potential environmental and social risks and impacts and to identify specific groups needs and possible concerns. A draft gender assessment and baseline, containing disaggregated data and approach, containing specific approaches for women and youth, has been developed – see annex 5.

Normative, planning and capacity development activities (i.e. non-concrete interventions) under components 1, 2 and 4 consist of strategies and plans development, capacity development and knowledge exchange. The project will ensure beneficiary groups will be equally represented and equal benefit from the project activities – see annex 4.

Activities under components 3 are 'concrete' adaptation actions. Because of the scope of the proposed actions, which are numerous, small scale and very localized, and will be operated and maintained by water authorities, municipal staff and communities, where possible, who have a stake in avoiding environmental and social risks and impacts, potential direct impacts are limited. Indirect impacts and transboundary impacts are highly unlikely given that water quality improvement activities will only result in improved water quality, not a degradation. Target streams are not transboundary. Given this, cumulative impacts are also unlikely. Because of this, the entire project is regarded as a medium risk (Category B) project. Annex 4 provides an overview of risks screening and impact assessment outcomes conducted in both Lebanon and Jordan. In both countries, risks screening sheets have been completed for each proposed project activity. Besides that, accredited consultants prepared country-specific ESIA, ESMPs and consultations reports in compliance with the AF ESP and GP and national requirements for conducting ESIA. The outcomes have been consolidated in the proposal. ~~The only proposed project activity that required an ESIA by law is the constructed wetlands in Bar Elias, Lebanon.~~ A scoping report has been prepared, submitted and approved by the Lebanese government.

The country specific ESIA, ESMPs and consultations reports are available through above website. The completed risks screening sheets for each project activity are available on request. The country-specific ESIA, ESMP and consultation reports are accessible here:
<https://unhabitat.org/af-lebanon-jordan>

The project is designed to generate positive economic, social and environmental impacts, using inputs from especially women and youth and DPs and host communities in target communities and by incorporating best practices from other projects. Consultation to comply to the AF ESP and GP have been completed – see Part II.I, Annex 3 and above publications The adaptation actions proposed have been selected together with ministries (through already established project steering committees), mayors, and community and vulnerable group representatives, making sure they are culturally and specific area-appropriate

Summary of outcomes:

Principle 1: Relevant laws and standards have been identified, including how the project and sub-project / outputs comply. Principles, 2,3 and 5, detailed stakeholder mapping has been conducted, vulnerable groups consulted and an inclusive assessment, planning and management approach for project implementation proposed. Principle 4 and 6: the human rights and core labour rights not ratified have been identified and relevant agencies consulted to identify related potential risks and mitigation measures. Principle 7: no indigenous groups were identified in the target areas. Principle 8: all involuntary resettlement will be avoided; all interventions will be on public land or in building of which owners and managers agreed with the proposed interventions. Principle 9 and 10: no protected natural habitat would be harmed, as confirmed by IUCN. 11 and 12: project activities may result in small increase of energy use. This will be compensated through installation of PV. Principle 13. Although project activities aim to improve water quality, there may be a risk that the quality does not comply to standards. Risks mitigation

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measures are in place to ~~reducer~~ reduce the risk. Principle 14, no heritage sites were identified in the target areas (as per UNESCO website). Principle 15: lands and soils will not be affected negatively as all proposed interventions have a sustainable land use planning approach and won't touch vulnerable soils. For more info see Part II.F, Part II.I and annex 3, 4 and 5.

Table 19: Overview of the environmental and social impacts and risks. For more details see section annex 4.

Checklist of environmental and social principles	Principle triggered during risks screening	Justification. (For potential impacts and risks see annex 4 and country-specific assessments conducted)
<i>Compliance with the Law</i>	No	All relevant rules, regulations and standards have been identified for all proposed project activities, including procedures / steps to comply to these.
<i>Access and Equity</i>	No	All project beneficiaries (i.e. population; groups) have been mapped for each project activity / output. Community consultations and focus groups discussions have been conducted per beneficiary group to identify possible rivals, disputants and concerns related to equal access of project benefits
<i>Marginalized and Vulnerable Groups</i>	No	All project beneficiaries (i.e. population; groups), including marginalised and vulnerable groups have been mapped for each project activity / output. Desk research, expert consultations and community consultations and focus group discussions have been used to identify possible risks / adverse impacts of project activities on marginalized and vulnerable beneficiary groups (i.e. specific needs, limitations, constraints and requirements of groups).
<i>Human Rights</i>	No	Possible project human rights issues have been identified by assessing whether Jordan and Lebanon are cited in any Human Rights Council Special Procedures, and to confirm and understand possible issues through consultations with 'experts.' Communities have also been consulted about possible human rights issues with the purpose of design activities appropriately
<i>Gender Equity and Women's Empowerment</i>	No	All project beneficiaries (i.e. population; groups), including women and youth have been mapped for each project activity / output. Desk research, expert consultations and community consultations and focus group discussions have been used to identify possible risks / adverse impacts of project activities on women and youth. A annex containing a gender assessment has been developed
<i>Core Labour Rights</i>	No	Possible Core labour rights compliance issues have been assessed by analysing if Jordan and Lebanon ratified relevant conventions and by understand possible issues through consultations with ILO
<i>Indigenous Peoples</i>	No	No indigenous people are present in the project / programme target areas.
<i>Involuntary Resettlement</i>	No	No physical or economic displacement will take place due to the project/programme. This has been determined by mapping project target sites land ownership (private, public) and land use, also informally, and through consulting communities / users on the possible risk of resettlement and to get agreement on proposed interventions (i.e. no interventions will take place without the consent of inhabitants in the targeted areas). Land owners, private or public, have agreed with using their land for project activities. As for the wetlands, the target land is public land (belonging to the Litani River Authority) and no land use, even informally takes place in the area.
<i>Protection of Natural Habitats</i>	No	It has been checked if any critical natural habitats exist in the target location, including their location, characteristics and critical value (i.e. legal protection status, common knowledge or traditional knowledge), as well as possible negative impacts on these due to project activities. This has been done by checking IUCN Red list and by consulting IUCN (regional office)
<i>Conservation of Biological Diversity</i>	No	It has been checked if any important biodiversity exist in the target location, including their protection status and other recognised inventories as well as possible negative impacts on these due to project activities. According to the IUCN red list and UNESCO Man and the Biosphere Programme reserve, no sensitive biospheres are located in the target areas. This was confirmed through consultations with IUCN (regional office).
<i>Climate Change</i>	No	Although very limited, energy use could be increased because of pumping of water from WWTP to farm lands. To compensate for this, PV will be installed at the plants
<i>Pollution Prevention and Resource Efficiency</i>	YES	An analysis of possible risks of inefficiencies in energy and material resource use and waste and pollution risks of each activity has been conducted. Irrigation of waste water from the Zahle WWTP for instance has been designed to serve farmers through a gravity system. There may be a small risks of contamination of soil, surface water and groundwater because of project activities at WWTP. Therefore some risks mitigation measures are put in place.

Public Health	YES	To avoid potential negative health impacts for project activities and other activities safety signs and equipment will be provided in line with core labour rights (155 and 187). Although the project intends to improve the quality already used for irrigation, water quality monitoring is required. The same accounts for the rainwater harvesting and greywater treatment and reuse interventions. Therefore some risks mitigation measures are put in place to make sure there will be no health risks because of water use.
Physical and Cultural Heritage	No	It has been checked if physical or cultural heritage sites are present or near project sites, as well as possible risks of impacts on these due to project activities. UNESCO listed Heritage sites in target area: Anjar has been identified as a heritage site in Lebanon (in the district of Zahle). However, this is not in the target areas
Lands and Soil Conservation	NO	The project ensures no negative impacts lands and soil conservation will result from project activities. All proposed project activities aim to enhance sustainable land and soil use, especially for agriculture use. No major excavations will take place, except for the initial phase of constructing the wetlands in Bar-Elias, but this is to enhance vegetation. A study of the targeted area was done, showing that the target area has low organic matter content, which is one indicator of soil fragility. The proposed intervention will reduce the loss or degradation of the soil, reducing any related risk.

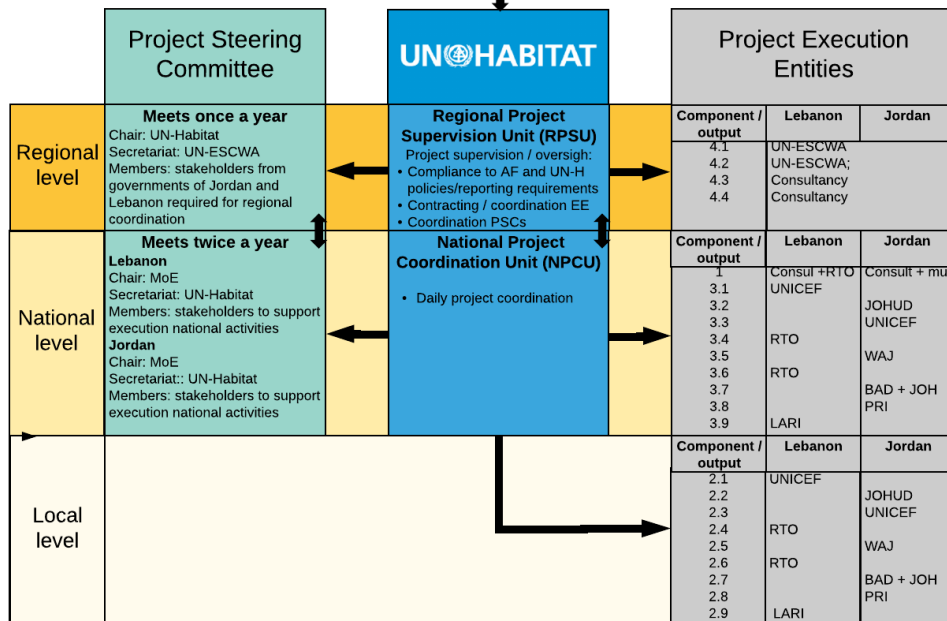
PART III: IMPLEMENTATION ARRANGEMENTS

A.a. Arrangements for project management

The following arrangements for project management (oversight, coordination and execution) have been agreed upon with AF DAs, the project steering committees and Execution Partners in Jordan and Lebanon.

Figure 15: Project Organigram

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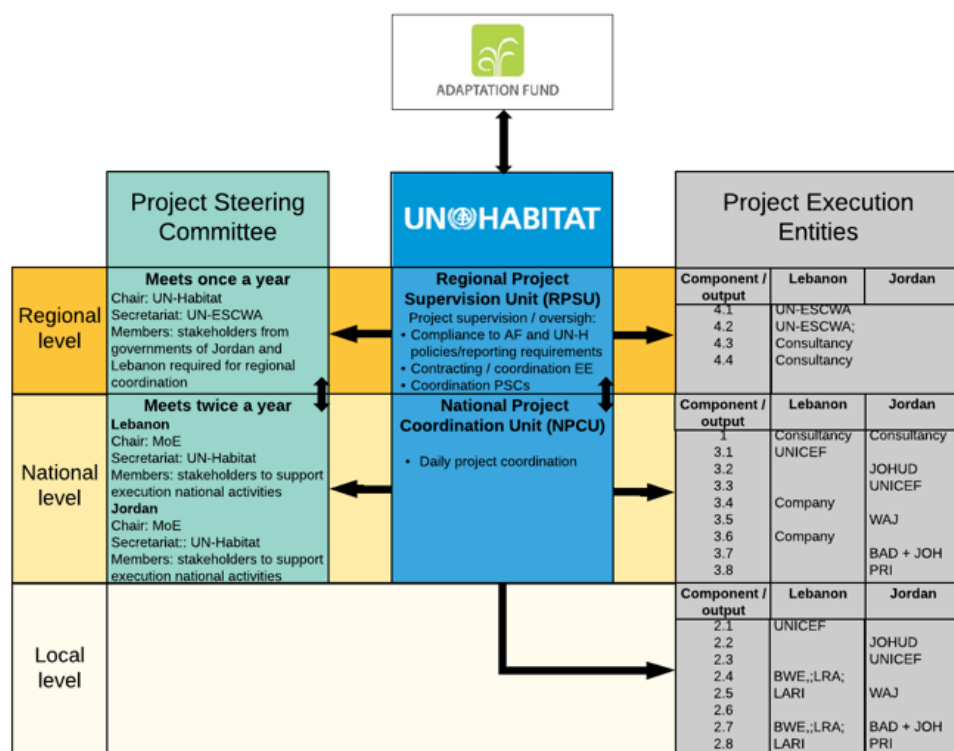


Table 20: Key project organigram stakeholders and roles and responsibilities

Stakeholder	Role and responsibility
UN-Habitat	Project oversight / supervision and coordination Compliance with AF and UN-H policies and reporting / M&E requirements, incl. safeguarding system Contracting and coordination execution partners Coordination with Project Steering Committees to execute project components / activities
Project Steering Committees	Providing technical inputs to ensure smooth implementation of the project from start to completion, including providing advice on how to deliver project outputs and the achievement of project outcomes in a timely matter in line with national and sub-national strategies and technical standards: Required coordination with relevant ministries and authorities Approve annual work plans and review key project periodical reports; Review any deviations and consider amendments to work plans and contractual arrangements.
Project Execution Entities	Execute specific project components / activities

The organigram above (Figure 15) shows how the project will be supervised, coordinated and executed at the regional, national and local level. As UN-Habitat is the Multilateral Implementing Entity (MIE) of the project, UN-Habitat will be responsible for the overall implementation of the project, including contracting of execution partners and coordination with stakeholders that have a 'stake' or say in the project, mostly through Project Steering Committees.

Regional level: at the regional level, project implementation will be supported through a **Regional Project Supervision Unit (RPSU)**. This 'Unit' will be responsible for project supervision / oversight, including coordination with and between **National Project Coordination Units (NPCUs)**, the **Regional-level**

Project Steering Committee (PSC) and the **Project Execution Entities (PEE)**. The Regional Project Supervision Unit will be responsible for ensuring project compliance with the AF and UN-H policies and reporting requirements, for contracting the Project Executing Entities and it will chair the Regional-level Project Steering Committee. It will also support on climate change and guide the community of practice. This Regional-level Project Steering Committee will be responsible for 'steering the 'whole' project from start to completion and for ensuring that the regional component (i.e. component 4) of the project is realized.

National level: at the national level, project implementation will be supported through **National Project Coordination Units (NPCUs)**. These 'Units' will be responsible for daily project coordination in Jordan and Lebanon, including coordination on execution of the project activities with the Project Execution Entities. The 'Units' will also be a member of the **National-level Project Steering Committees (PSCs)** in Jordan and Lebanon. These National-level Project Steering Committees will be responsible for 'steering the country specific project activities from start to completion.

Local level: at the local level, project implementation will be supported through the **National Project Coordination Units (NPCUs)**. The **National-level Project Steering Committees (PSCs)** will also have (government) representatives from the sub-national level, including from the target municipalities.

Table 21: Stakeholders in the project steering committee

Stakeholders	Project Steering Committees (PSC)		
	Regional	National	
		Lebanon	Jordan
UN-Habitat	Chair	Member	Member
UN-ESCWA	Co-chair	Member	Member
Lebanon MoE	Member	Chair	
Lebanon MoEW	Member	Co-chair	
Lebanon CDR		Member	
Lebanon Bekaa Water Establishment		Member	
Lebanon Litani River Authority		Member	
Lebanon Agrarian LARI Research Institute		Member	
Lebanon Municipality of Zahle	Member	Member	
Lebanon Municipality of Bar Elias	Member	Member	
Lebanon Execution Entities	On request	On request	
Jordan MoEnv	Member		Chair
Jordan MoPIC	Member		Member
Jordan MoWI			Co-chair
Jordan MoLA			Member
Jordan MAIAHP			Member
Jordan MoE			Member
Jordan Municipality of Irbid (GIM)	Member		Member
Jordan Municipality of Mafraq (GMM)	Member		Member
Jordan Execution Entities	On request		On request
Total	9 + invitees	10 + invitees	10 + invitees

In both Lebanon and Jordan, The National-level Project Steering Committees have been established, and chairs, co-chairs and members have already been identified and agreed upon. These Committees have already been functioning to support the development of this project proposal, including approving proposed Project Execution Entities, activities, budgets, etc.

Key stakeholders and roles and responsibilities

Table 22: overview main stakeholders and roles and responsibilities

Regional level

Stakeholder	Role and responsibility	
	Current	Project
UN-ESCWA	Regional coordination between governments in Arab region, including on climate change and urban agenda	Co-chair PSC at regional level Execution component 4 Coordination execution component 4 at national level

National and local level - Lebanon

Government			
Stakeholder		Role and responsibility	
Main	Sub + Commissions	Government	Project
Ministry of Environment (MoE)	AF DA Office of the Minister Climate Change Department Urban Environment department	Manage the environment through policies, plans and legislation, including conserving water resources	Member PSC at regional level Chair of the PSC at national level Policy advice and coordination and focal point on national Environmental and Social Policies and standards compliance Scaling up adaptive measures to mitigate pollution to water bodies through the environmentally friendly and sound interventions.
Ministry of Energy and Water (MoEW)	Office of the Minister Water Resource department	Manage water resources and energy through policies, plans and legislation	Member PSC at national level Advise on execution component 3 on Wastewater reuse and diversion, also on Wetlands O&M. Scaling up wastewater reuse and climate adaptive measures related to water scarcity.
Council for Development and Reconstruction (CDR)	Water resources department	Engages in all phases of project implementation from planning, feasibility analysis, detailed design, bidding, expropriation, execution, and operation and maintenance of most public facilities on the behalf of the Government	Member PSC at national level Policy advice and coordination, including to comply to project national standards for public facilities Operation and Maintenance of large projects until handed over to Water Establishments.
Bekaa Water Establishment (BWE)	Office of Director General Water resources department	Applies strategies and master plans for the Bekaa area, done in collaboration with the MoEW; Operation and Maintenance of water and wastewater facilities and main networks. Provision of Water services. In charge of monitoring water resources and the measurement of flows, estimation of water needs, allocation of water resources in all of the Bekaa regions.	Member PSC at national level Advise on execution component 3 on especially on the management of water and wastewater facilities (operates under the MoEW)
Litani River Authority (LRA)	Office of Director General	Applies strategies and master plans for the Litani watershed, done in collaboration with the MoEW; Ensure water monitoring in all Lebanese rivers; Implement the Litani irrigation, drying, drinking water and electricity projects; Examine, manage and exploit the irrigation water in Central and Northern Bekaa	Member PSC at national level Advise on execution component 3 on managing the Wetlands and Litany river watershed (Operates under the MoEW) Scaling up and promoting for low cost and low maintenance measures to mitigate climate change impacts.
Lebanese Agriculture Research Institute (LARI)	Director	Working under the supervision of the Minister of Agriculture; conducts research and experiments to solve problems facing the agricultural sector in this area; Has at its disposal eight experimental stations in an area of 280 hectares of agricultural land; Keeps close ties to the farmers and tries to develop research activities aiming at solving their problems.	Member PSC at national level Advise on execution component 3 on all irrigation projects, farmers and crops (operates under the MoA) Scaling up and training more farmers to adopt climate change adaptive measures in agriculture.
Municipality of Zahle		Manage all public work projects, including water, electricity, and	Member PSC at regional level Member PSC at national level

	Public works committee of both municipalities	garbage collection according to law 118/1977; Public works and infrastructure implementation spent for municipal budget. Operation and maintenance	Policy advice and coordination, including to align with local plans Advise on execution component 1 and 3
Municipality of Barr Elias	Municipal council members		Member PSC at regional level Member PSC at national level Policy advice and coordination, including to align with local plans Advise on execution component 1 and 3 and especially adopting construction measures to harvest rainwater in new constructions.
Municipalities of Hazerta, Bar Elias, El Marj, Saadnayel, Taanayel, Taalabaya, Terbol, Ferzol		Municipalities are responsible for managing unconventional water sources and supply within their boundaries, such as rainwater harvesting; Municipalities are also responsible for developing and managing municipal master plans in coordination with DGU	Member PSC at national level Policy advice and coordination, including to align with local plans Advise on execution component 1 and especially tackling climate change adaptive measures in territorial planning.
Non-government			
UNICEF		Coordination of the inter-agency humanitarian response of the education and water sector and the child protection sub-sector in support of the Government; main government partner on WASH	Execute outputs: 3.1

National and local level - Jordan

Government			
Stakeholder		Role and responsibility (policy / M&E, implementation, etc)	
Main	Sub + Commissions	Government	Project
Ministry of Environment (MoEnv)	AF DA Directorate of the Climate Change	Manage the environment through policies, plans and legislation, including conserving water resources	Member PSC at regional level Chair of the PSC at national level Policy advise and coordination and focal point on national Environmental and Social Policies and standards compliance
Ministry of Planning and International Coordination (MoPIC)	International Cooperation Department Local Development & Enhanced Productivity Programs	Responsible for improving development policies and promoting active participation in the process, including coordinating and managing the necessary funding for development projects; responsible for preparing and updating Joint Response Plan (JRP) for Syrian crisis	Member PSC at regional level Member PSC at national level Policy advise and coordination, especially on JRP and platform
Ministry of Water and Irrigation (MoWI)	Climate Change Unit, Wastewater and sanitation Affairs (Design and Feasibility Study Directorate and Supervision and Technical Support Directorate), and Water Demand Management Directorate)	Manage water and irrigation through policies, plans and legislation. Awareness and Media Unit established a showcase room of water saving devices in the ministry	Member PSC at national level Policy advise and coordination, including to comply to national water strategies, plans and policies Advise on execution component 3 on rooftop water harvesting (JVA) and the showcase rooms in municipal government buildings
Ministry of Local	Zoning Directorate, Legal Unit,	Technical, financial and administrative advisor for all the local councils in the Kingdom	Member PSC at national level Policy advise and coordination, including on execution component 4: adopting a

Administration (MoLA)	Higher Planning Council		national programme for water harvesting from rooftops at municipal levels in the project selected governorates, incl. providing incentives/ exemption to encourage the installation of rainwater harvesting and scale it up at national level
The Ministry of Awqaf Islamic Affairs and Holy Places (MAIAHP)	Construction and maintenance department, Directorates of Awqaf at Irbid and Mafrq Governorates	Responsible for the Hajj & Umrah, Mosques –their reconstruction, rehabilitation, their needs and workers (Imam, etc)-;	Member PSC at national level Policy advise and coordination on activities in Mosques Facilitate(d) coordination with Directorates of Awqaf in Irbid, Ramtha and Mafrq to select Mosques where activities related to greywater reuse and rooftop rainwater harvesting will be implemented. Contribute to the public awareness campaigns and training in Mosques (through Imam) Directorates - Supervise the O&M of the installed systems in mosques
Ministry of Education (MoE)	Directorate of Education in Irbid and Mafrq	Responsible for the Jordanian educational system	Member PSC at national level Facilitate(d) coordination with Schools Building Directorates in Irbid and Mafrq to select schools where activities related to rooftop rainwater harvesting and greywater reuse will be implemented. Provide capacity building and trainings to M. Of Education's building directorates' engineers Directorate - Contribute to the public awareness campaigns and training on the operation and maintenance of the installed systems at schools.
MoWI / Yarmouk Water		Management of water in the north sector in accordance with the provisions of the Jordanian companies Law No. (22) of 1997, which is wholly owned by the Jordan Water Authority.	Execute interventions related to enhancement of the treated wastewater quality and the management of its reuse by farmers in Mafrq, Maerad and Al Akaidar around the WWTPs. Continue to monitor the performance and operation of installed infrastructures and used treated effluent quality. Facilitate coordination with farmers Manage the reuse of reclaimed water by farmers, local NGOs and WUAs. Support the public awareness campaigns related to installation of WSDs
Greater Irbid Municipality (GIM)		Manage all public work projects, including water, electricity, and garbage collection. Municipalities are responsible for managing unconventional water sources and supply within their boundaries, such as rainwater harvesting; Municipalities are also responsible for developing and managing municipal master plans	Member PSC at regional level Member PSC at national level Policy advise and coordination, including to align with local plans Advise on execution component 1 and 3, esp. water harvesting, incl. enforce the installation of rooftop rainwater harvesting system and tanks and issue relevant permits Facilitate coordination with other local authorities and stakeholders
Greater Mafrq Municipality (GMM)			Member PSC at regional level Member PSC at national level Policy advise and coordination, including to align with local plans Advise on execution component 1 and 3, esp. water harvesting, incl. enforce the installation of rooftop rainwater harvesting system and tanks and issue relevant permits Facilitate coordination with other local authorities and stakeholders

Non-government		
The Jordanian Hashemite Fund for Human Development (JOHUD)	Johud is a local Non-Governmental Organization which has 51 Community Development Centers (CDCs) throughout the kingdom targeting the less fortunate groups, and remote and poor communities. Their work focuses on promoting water conservation awareness and providing livelihood opportunity in agriculture, water, energy and environment.	Executing interventions related to rainwater harvesting from rooftops of mosques, schools, selected households and municipal buildings in addition to manage the treated wastewater reuse intervention in the farmlands around Maerad and Al Akaidar WWTPs and establish new and efficient irrigation technology. Capacity building and training on the installation of the irrigation system.
UNICEF	UNICEF is WASH sector lead in Jordan and their work focuses also on education and child protection in support of the Government. They have implemented WASH related activities in the Syrian refugee camps in Jordan.	Executing component 3, the intervention related to grey water treatment and reuse in schools and mosques.
The Hashemite Fund for the Development of Jordan Badia	The fund is mandated to establish the concept of sustainable development in the Jordan Badia by implementing environmental, social and economic projects, while maintaining and respecting the existing culture and habits. The implemented a number of projects related to treated wastewater reuse, fodder cultivation enhancement and livestock production	Execute and manage the treated wastewater reuse intervention in the farmlands around the treated wastewater reuse intervention around Mafrag WWTP and establish new and efficient irrigation technology. Capacity building of farmers and public awareness on water management and efficient irrigation systems.
Permaculture Research Institute (PRI)	PRI is a not-for-profit organisation, specialized in education, training and practical applications of permaculture design worldwide.	Execute the permaculture intervention at the Jordan University of Science and Technology (JUST). Provide capacity building and training to (JUST).

Legal and financial arrangements

UN-Habitat and the ministries of Environment (with the AF DAs) in Lebanon and Jordan will sign a joint **Memorandum of Understanding** to which this Project Document will be attached, to ensure that all partners are fully committed to the project.

UN-habitat will contract Project Execution Entities in Lebanon and Jordan through **Memorandum of Understanding (MoU) or Agreements of Cooperation (AoC)**, which are legally binding financial tools, and **UN to UN agreement** to contract UNICEF and UN-ESCWA. The contract will be negotiated by the Regional Project Supervision Unit and cleared by UN-Habitat ROAS / HQ. For the UN to UN agreements, overheads will be passed through from the 7 percent PSC from the project cycle management fees, so there will be no double charge

The Regional Project Supervision Unit will develop an operational manual that clearly outlines the roles and responsibilities of the key project stakeholders and contain all the necessary tools, forms and templates required to administer the project. The operation manual will be shared with the National Project Coordination Units for inputs. While UN-Habitat takes responsibility of audits in line with AF requirements (each year), all contractors will be required to have 'external' audits of their budgets. The contractors will also be required to support the independent final evaluation.

Roles and responsibilities for environmental and social risks management / AF ESP and GP compliance

The Regional Project Supervision Unit will be responsibility for environmental and social risks management, including implementation of the Project ESMP. An AF and UN-H policies and reporting compliance expert will be part of the RPSU. This expert will also supervise Project Execution Entities on the implementation of the Project ESMP. Guidelines showing how to comply to the AF ESP and GP will be shared with all execution entities and they will be guided on process, including monitoring. A

Safeguarding system compliance expert will also be part of the RPSU. Monitoring staff part of the RPSU will require having expertise in social risk management and be familiar with the AF safeguarding system. The RPSU will be backstopped by UN-Habitat HQ, with experts on climate change, human rights, environmental and social risks managements and gender policies.

In both Lebanon and Jordan government stakeholders responsible for compliance to national environmental and social policies and standards will be part of the Regional- and National-level Steering Committees, as well as government gender focal points.

All project-related ToR's and contracts will include clauses stating contractors will need to comply to the AF ESP, especially principle 1 (law), 4 (human rights), 5 (gender) and 6 and 13 (labour and safety) and the AF GP.

Adaptive management: when changes in project activities or additional activities are required, these will need to go through a new risks screening and impact assessment process in compliance with AF, UN-habitat and national policies and standards. When this is required, this will be led by the RPSU and the Regional-level Project Steering Committee would need to approve the changes. For instance, when allocated budget allow targeted additional buildings for installing RWH systems, this would be possible following above process.

Launch of the project

At the launch of the project, UN-Habitat's, together with UN-ESCWA will organize **an inception workshop** inviting members of the Regional-level Project Steering Committees, Execution Partners and other key stakeholders. The project approach and the proposed outputs and outcomes of the project will be presented and discussed with the purpose to solicit feedback and inputs in a participatory manner. Comments and feedback will be incorporated in project frameworks and workplans. The Inception Workshop aims to:

- (i) Enhance participants' understanding of the project objectives and activities and take ownership of the project
- (ii) Discuss and confirm the organizational structure of the project, including roles and responsibilities
- (iii) Confirm / agree upon project monitoring framework and workplan
- (iv) Confirm / agree upon project risks management framework
- (v) Discuss and agree upon project knowledge management framework and plan
- (vi) Confirm / agree upon the project Environmental and social Risks Management Plan
- (vii) Agree on the annual work plan for year one.

The inception workshop will be organised within three months after signing the project agreement between the Adaptation Fund and UN-Habitat.

This project will conduct a climate change mandate segregation exercise at the inception phase to differentiate the confusing climate change roles of the national government (Ministry of Environment/Ministry of Local Administration-Municipalities) versus the roles of the local (municipal) level as this will be the unique contribution (credit card) of this project. Since this project is creatively proposes to have the staff of the to-be-established Urban (Municipal) Observatories as the entities in charge for climate change function at municipalities, the needs of the staff of the such Urban Observatories will be assessed at the inception phase of the project and robust mandate/ToR will be drafted for them and based on that their training needs and capacity gaps will be determined much more clearly.

B. Measures for financial and project risk management

Under guidance of the regional project manager, supported by the National Project coordinators, Monitoring Officers will monitor the status of financial and project management risks, including those measures required to avoid, minimise or mitigate these risks, throughout the project (please see also Section Part III.D).

The table below gives an overview of overall potential project management and financial risks, an assessment of the significance of the pertaining risks in terms of likelihood and impact and outlines measures that have been embedded in the project design in order to manage and/or mitigate these risks.

Table 23: overview of financial and management risks and measures to mitigate these

Potential risks	Likelihood (1-5)	Impact (1-5)	Mitigation measures	Indicator to verify
Institutional				
1 Delay of project start-up because critical staff is not in place and / or lengthy contracting process, incl. negotiations with execution entities	3 Med	3 Med	1.1 UN-Habitat appointed critical staff at UN-H ROAS to start the process required to start the project, incl. putting project staff in place and preparing the inception workshop immediately after signed project agreement between UN-Habitat and the AF; 1.2 All execution entities have been identified and proposed project activities and budgets have already been agreed upon. 1.3. UN-habitat commits to organise the inception workshop within three months of the signed project agreement between UN-Habitat the AF	The inception workshop was organised within three months of the signed project agreement between UN-Habitat; Execution entities to execute activities in the 1st project year are contracted within six months after the inception workshop
2 Loss of government support (at ministerial and municipal level) for the project and activities because of elections and related functions of the project steering committee, which may result in lack of prioritization of AF project activities or different pace of execution of activities in Jordan and Lebanon	1 Low	3 Med	2.1 National Project Steering Committees (PSCs) have already been formed during the project preparation phase and these have approved proposed project activities and budgets, etc. This shows a participatory and inclusive project design process took place with ownership of the project as a result. If due to elections, new members of the PSCs will need to be selected, this will be requested by UN-Habitat and AF DA as soon as possible and records of decisions made during earlier PSC will be shared. 2.2 Delays in one country don't have to result in delays in the other country because of functioning national PSCs 2.3 UN-Habitat will establish agreements with the MoE in Lebanon and MoEnv in Jordan (with non-changing AF DA) (through MoUs) to ensure above	Confirming steering committee members and roles and responsibilities during inception workshop + report Government focal point to coordinate SC appointed at inception workshop MoU signed within 6 months six months after the inception workshop
3 A lack of coordination between and within national government Ministries and Departments and municipalities	1 Low	3 Med	3.1 Regional and National PSCs are to ensure coordination. Representatives from the target municipalities are members of both regional and national PSC. 3.2 Roles and responsibilities related to project implementation of PSC members, also for operation, maintenance and sustainability of activities, have already been identified and focal points within the ministries and municipalities will be appointed through an official letter. 3.3 Should UN-Habitat observe coordination problems, the agency will try to resolve issues directly with government focal point and / or concerned parties	See above
4 Capacity constraints of executing entities, local institutions, communities and the private sector may limit the effective implementation of interventions	1 Low	3 Med	4.1 The project has a strong capacity building and training component (component 2), designed to operate, maintain, sustain and replicate project activities, esp. at the community level 4.2 UN-Habitat will have dedicated project staff with expertise in spatial / urban planning, climate change, community organization and technical design, M&E and safeguards to ensure quality control from UN-Habitat side.	Capacity building indicators to be established Critical staff as mentioned being part of project staff

5 Communities may not adopt activities during or after the AF project, including infrastructure maintenance	2 Low	4 High	5.1 A strong participatory approach at the community level is used and will be used (component 2) during project implementation to ensure ownership and support of communities to the realised interventions in the targeted project areas. UN-Habitat works with UNICEF and NGOs partners already well established in the target area, to build on relations already established. 5.2 Capacity building and training of communities will be undertaken to improve their awareness and understanding of the benefits of the activities, including infrastructure operation and maintenance (component 2).	See above
Financial management and Requisite Institutional Capacity				
6 Complexity of financial management and procurement. Certain administrative processes could delay the project execution or could lack integrity or needed capacity	2 Low	2 Low	6.1 Financial management arrangements have been defined during project preparation, including identification of all executing entities, which already agreed on the activities and budgets (see also 1.2. above); 6.2 UN-Habitat's control framework, under the financial rules and regulations of the UN secretariat, will ensure documentation of clearly defined roles and responsibilities for management, internal auditors, the governing body, other personnel and demonstrates proof of payment / disbursement; In line with AF and UN-Habitat policies, audits will take place annually and / or for each contract of USD 500k. 6.3 Activity specific procurement will be managed by the executing entities as agreed through standard Agreements of Cooperation (with relevant conditions, incl. evidence of recognised procurement policies and procedures and specific terms and conditions for timely disbursement of funds for project activities while at the same time ensure provisions on good financial management, hence minimizing the risk of fund mismanagement or corruption). The RPMU has a certifying role (for key procurements / expenditures).	Timely audit reports (inception and yearly + following UN-H regulations) Timely evidence of recognised procurement policies and procedures provided by Execution Entities
7 Inflation and instability of the national currency leading to budget issues and increased prices for infrastructure delivery	3 Med	1 Low	7.1 All budgets will be in US\$ 7.2 Include clauses in all contract, incl. with private sector, that they can't increase the costs during the project duration.	All budgets in US\$ Clauses in all contract, incl. with private sector, that they can't increase the costs during the project duration.
Physical				
8 Political instability <u>and COVID-19</u> in the target localities inhibits movement and access to target areas	1 Low	4 High	8.1 The selected project sites are labelled as being safe. However, UN-habitat will only let field work proceed if agreed with the UN security unit <u>and in line with COVID-19 procedures</u> 8.2 Execution entities will require having permanent field staff at project sites, recuing the need to travel 7.3 If target areas are not accessible, UN-Habitat and the proposed execution entities will identify alternative intervention locations and request approval from the SC and AF	Permanent field staff at project locations
Environmental				

9 Poor weather conditions (especially in winter) affect implementation of activities	2 Low	1 Low	9.1 UN-habitat and the proposed execution entities have developed their work plan according to expected weather conditions and the majority of activities should be able to be carried out despite severe weather conditions as they are inside closed areas. If unexpected weather patterns occur, the proposed activities and work plan will be reviewed to make practical adaptations.	Work plans avoiding critical concrete works being planned in winter
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C. Measures for environmental and social risks management

Part II.L of this proposal shows the outcome of the environmental and social risks screening and impacts assessment that has been conducted for this project to comply to the AF ESP and GP. Part II.I describes the consultation process conducted to support the development of this proposal, including for this project to comply to the AF ESP and GP. In annex 3 it shows what consultations have been conducted to identify potential environmental and social risks and impacts, including with key stakeholders such as UN agencies and beneficiary groups (i.e. potentially vulnerable groups, including women and youth). Part III.A describes the allocated roles and responsibilities for environmental and social risk management, including for the implement of the project ESMP. A designated budget for environmental and social risks management, including the implementation of the ESMP, has been included in part III.G. In Annex 4, all the details of the risks screening, impact assessment, ESMP, incl. the risks monitoring system and budget, are provided.

Based on the screening against the 15 AF principles, the project has been categorised as a "B" category project in terms of the environmental and social risks it poses.

According to the Jordan's EIA Regulations, particularly the EIA By-Law No. 37 of the Year (2005), the project has been categorized as "*Category III*" project, which imply that the proposed interventions in Jordan have no considerable risks or adverse impacts, thus not requiring full EIAs. This is due to the fact that all of the construction activities and installations of proposed sub-projects are not substantial and will be constructed or installed in already built and operating facilities, such as fully-functioning WWTPs, which at the time of original construction have been subjected to MoEnv's incumbent EIA regulations and supervision. However, although no impact assessments were required by national law, a full [ESIA and ESMP report](#) has been developed for the proposed project activities / outputs in Jordan, accompanied by a consultations report.

According to Lebanese decree 8633 MoE, 2012, Annex 1, the proposed project activities / outputs don't required full EIAs, ~~except the proposed constructed wetlands in Bar Elias, as this activity was categorised as 'category II' sub-project, which imply that an initial screening was required, followed by an EIA.~~ Similarly to Jordan, all of the construction activities and installations are not substantial and will be constructed or installed in already built and operating facilities, ~~except the proposed wetlands, which will be constructed on public land selected by the government for this purpose.~~ To comply to the AF requirements, risks screening and impact assessments have also been conducted for all proposed project activities.

Country specific ESIA-ESMP and consultation reports can be found here: <https://unhabitat.org/af-lebanon-jordan>

Table 24: ESP and GP compliance requirements and how the proposal complies to these requirements

ESP and GP compliance requirements	Project compliance to the AF ESP and GP	Reference / evidence
Have all potential environmental and social risks been identified for <i>all</i> project/programme activities prior to funding approval?	All potential environmental and social risks (incl. for gender and considering their significance) have been identified) for all project/programme activities at the project preparation phase. In both Jordan and Lebanon, accredited consultants prepared country-specific ESIAs, ESMPs and consultations reports in compliance with the AF ESP and GP and national requirements for conducting ESIAs; Outcomes have been consolidated in the proposal	Part II.I Part II.L Annex 4 (ESP annex) Annex 5 (GP assessment annex)

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Has the environmental and social assessment been completed before the project/programme proposal submission to the Adaptation Fund, and its findings included in the proposal document?	In compliance with the AF ESP and GP and national requirements for conducting ESAs, above reports have been reviewed and approved by the Jordan and Lebanon ministries of environment. Outcomes have been consolidated in the proposal.	https://unhabitat.org/af-lebanon-jordan
Has an ESMP been developed and does this include safeguard measures to be implemented during a project/programme?	A project ESMP has been developed, including safeguarding measures. The following has been included in the ESMP: Allocated roles and responsibilities environmental and social risk management / implement of the ESMP Opportunities for adaptive management Arrangements to supervise executing entities for implementation of ESMP Budget provision to manage environmental and social risks / implement of the ESMP Measures to avoid, minimize, or mitigate potential risks Risks monitoring system / indicators Grievance mechanism	Part III.A (roles and responsibilities for env. and social risk management) Annex 4 (ESP annex)
Will a grievance mechanism be put in place and how will it be made widely known to identified and potentially affected parties	A project grievance mechanism will be put in place, as described in the ESMP. It will be made widely known to identified and potentially affected parties through community mobilisers, posters and online content	Annex 4 (ESP annex)

D. Arrangements for monitoring, reporting and evaluation

M & E Framework and plan

Monitoring and Evaluation (M & E) arrangements for this project will be in compliance with the AF M&E guidelines and ESP and GP and with UN-Habitat M & E policies and guidelines. This means, as a minimum, the following will be monitored and evaluated: project Milestones, Financial data, Procurement data, Risks assessment, ESP Compliance, GP Compliance, Project indicators, Lessons learned, project Results. The M & E of progress in achieving project results will be based on targets and indicators (also for gender) established in the Project Results Framework (see Part III.E).

The annual project performance reports (PPRs) will include a section on the status of implementation of any environmental and social management plan, including those measures required to avoid, minimize, or mitigate environmental and social risks. The reports shall also include, if necessary, a description of any corrective actions that are deemed necessary. The terminal evaluation report will include an evaluation of the project's performance with respect to environmental and social risks.

UN-Habitat will ensure timely and high-quality M & E by keeping oversight of the process by providing guidance to the Project Execution Entities and national government partners through full briefing of M & E requirements. Where possible, the M & E process will be participatory, involving key stakeholders at national, municipal and communities. Project activities will be monitored by the RPSU and NPCUs with dedicated monitoring staff, which will require having expertise of M & E compliance to the AF ESP and GP. The M & E framework and plan will also need to be endorsed by the Regional-level Project Steering Committee. Audits of the project's financial management will follow AF regulations and rules and applicable audit policies. The M&E plan will be implemented as proposed in the table below.

Table 25: M & E plan

Type of M&E Activities	Responsible Parties	Time Frame	Reporting
Inception Workshop and Report	UN-Habitat ROAS & Regional project coordinator Coordinated with: UN-ESCWA Regional-level Steering Committee	Workshop: within first three months of signing between AF and UN-habitat Report: within one month after inception workshop	Inception Report, including 1 st year workplan, monitoring framework and plan; project risks management framework and plan; environmental and social risks management framework and plan; knowledge management strategy
Periodic status/	UN-Habitat ROAS & Regional	Annually	Annual Report, mid-term, final

progress reports	project coordinator Coordinated with: NPCUs and Project EE and IOIS		
Compliance with ESP and GP		Annual, as well as upon receipt of complaints, grievances or queries	Annual Report, mid-term, final
Audits		As per AF (annually)	Audit Reports
Terminal project performance report		No later than one months after project completion	Terminal project performance report
Final Evaluation	UN-Habitat ROAS & Regional project coordinator Coordinated with: External consultants and NPCUs, Project EE	No later than three months after project completion	Final Evaluation Report
Community consultations / workshops / trainings, etc.	Project EE Coordinated with: NPCUs	Within one week after each event	Documentation
Visits to field sites	UN-ESCWA Coordinated with: UN-Habitat ROAS & Regional project coordinator Regional-level Steering Committee	At least every year	Field visit Report
Video with 'before' and 'after' the project	UN-Habitat ROAS & Regional project coordinator Coordinated with: UN-ESCWA Regional-level Steering Committee	Video one: before start of concrete interventions Video two: after completion concrete interventions	Video compilation of project results

For the M & E budget and a breakdown of how MIE fees will be utilized in the supervision of the M & E function, please see the detailed budget (Part III.G). For related data, targets and indicators, please see the project proposal results framework (Part III.E).

M&E Activities

a) Inception workshop and Project Steering Committee meetings

During the first Regional-level Project Steering Committee meeting, which will be organized in conjunction with the project Inception Workshop. The Committees will monitor / review project progress and provide technical guidance. During the first Regional-level Project Steering Committee meeting, the following will be reviewed: the project organizational structure, includes roles and responsibilities, the project monitoring framework and workplan, the project risks management framework, the project knowledge management framework and plan, the project Environmental and social Risks Management Plan and annual work plan for year one. The Regional-level Project Steering Committee will meet every year and the National Project Steering Committees will meet every six months, and ad-hoc meetings will be held as needed.

b) Periodic project monitoring and terminal project performance reporting

Annual project performance monitoring will be conducted using the AF PPRs template. This will include monitoring of project: Milestones; Financial data; Procurement data; Risks assessment; ESP Compliance; GP Compliance; Project indicators; Lessons learned; Project Results

c) ESMP implementation monitoring

The implementation of the project Environment and Social Management Plan (ESMP) as described in Annex 4 will be monitored. The ESMP includes monitoring indicators and responsibilities for identified potential risks, impacts and mitigation measures. A dedicated budget for monitoring the compliance to the AF ESP and GP has been included in Part III.G

d) Financial Audits

A professional, certified and independent organization will review the financial management of the project and adherence to required standards and regulations.

e) Final Evaluation

No later than three months after project completion, a final evaluation will be conducted following AF and UN-Habitat policies and guidelines. It will be conducted by an independent team of international and national experts in consultation with executing entities and national stakeholders as a participatory process.

f) Community Level Participatory Monitoring

Part of the detailed project monitoring framework and plan will be identified through activities to involve Project Execution Entities and beneficiaries at the community level in monitoring activities. This would include community-level monitoring of Gender and Youth responsiveness and impact of the project.

g) Periodic Project Site Visits

Members of the Regional-level Project Steering Committee and representatives of UN-Habitat will visit project sited and hold meetings with the local stakeholders to monitor the implementation of project activities.

h) Video with 'before' and 'after' the project

Also, as part of the knowledge management strategy and plan, a video recording project results will be produced using 'birds' eye' views and recording of project activities and beneficiaries

Reporting

a) Inception Workshop and Report

Within one month after the inception workshop, an Inception Report will be submitted to the AF and project steering committees' members. Reports will include: (i) agreement on organizational structure of the project, including roles and responsibilities; (ii) monitoring framework and workplan; (iii) project risks management framework; (iv) knowledge management framework and plan; (v) Environmental and social Risks Management Plan; (vi) year one work plan.

b) Annual project performance reports, including final report

The Annual project performance reports, which will be submitted to the AF, will include:

- (1) Milestones
- (2) Financial data
- (3) Procurement data
- (4) Risks assessment
- (5) ESP Compliance
- (6) GP Compliance
- (7) Project indicators
- (8) Lessons learned
- (9) Project Results

c) Community Level Meeting /Workshop / Training Reports and site visit

Reports on all community-level meetings, workshops, and training will be prepared by Project Execution Entities within one week of the event. Photo documented site visit reports, also to monitor women participation, will also be prepared by Project Execution Entities.

d) Final Evaluation Report

Independent consultant will prepare the Final Evaluation report in line with AF and UN-habitat evaluation policies and guidelines and norms and standards for evaluation in the UN system.

E. Project proposal results framework

Table 26: Project results framework with indicators, their baseline, targets, risks & assumptions and verification means. *Beneficiaries T = Total; F = Female; Y = Youth.

Expected Result	Indicators	Baseline data	Targets	Risks & assumptions	Data collection method	Frequency	Responsibility
Project component 1: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration							

<p>Outcome 14.4.4: Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries</p> <p>*In line with AF outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses</p> <p><u>Reduced exposure to climate-related hazards and threats at the municipal level</u> *In line with AF outcome 1: <u>Reduced exposure to climate-related hazards and threats</u></p>	<p>No and type of targeted institutions with increased capacity to minimize exposure to climate change (in line with AF results indicator 2.1) through strategies / guidelines and urban master plans with climate change and gender mainstreamed. Number of institutions at district level Number institutions at municipal level</p> <p><u>Relevant threat and hazard information generated and disseminated through to stakeholders on a timely basis (in line with AF results indicator 1)</u> <u>Evidence-based Municipal plans with climate change mainstreamed in them developed, disseminated during project and operational</u></p>	<p>0 0</p> <p><u>0</u></p>	<p>1 10 (8 in Lebanon and 2 in Jordan)</p> <p><u>10 (8 in Lebanon and 2 in Jordan)</u></p>	<p><u>Calculate number of target institutions with strategies and master plans developed</u></p> <p><u>Assess if climate change and gender are mainstreamed in strategies and plans and ensure criteria to do so are clear</u></p> <p><u>Assumption: Decision-makers at all levels and key sectors are willing to mainstream climate change considerations into planning and programming in a timely manner</u></p> <p><u>Assumption: There is a political will to embrace changes in the local and sectoral plans.</u></p> <p><u>Assumption: local authorities committed to fund and implement the plans</u></p> <p><u>Risk: lack of coordination between local and sectoral authorities for effective implementation of the municipal plans and prioritizing climate change</u></p>	<p><u>Collect the guidelines / strategies and plans and data from government staff involved in assessment, planning and management of the plans</u> <u>Collect guidelines, strategies, plans, how these are being disseminated (online) and assess if climate change is mainstreamed in it.</u></p> <p><u>Calculate number of target institutions and municipal plans developed and disseminated</u></p> <p><u>Assess if climate change and gender are mainstreamed in the plans and ensure criteria to do so are clear</u></p> <p><u>Means of verification: semi-annual and annual project reports, final evaluation, field visit reports</u></p>	<p>Baseline, mid-term and end</p>	<p>UN-Habitat in cooperation with EE and government entities</p>
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Output 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon *In line with AF output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	<u>% increased capacity of the staff</u> No. of staff trained to respond to, and mitigate impacts of, climate-related events (in line with AF results indicator 2.1.1) through assessment and planning processes (workshops/trainings) Number of staff / people Women participating Youth participating	0 0 0	T: 480 W: >40 % Y: >15 %	<u>Assumption: staff will be actively engaged in the trainings</u> <u>Assumption: women and youth are interested and available to increase knowledge and awareness on climate change mainstreaming in urban planning and to be involved in trainings and climate change planning activities</u> <u>Assumption: relevant institutions –included the ones that deal with women and gender issues -have been identified and are interested</u> <u>Risk: cultural perceptions are strong and limit women engagement</u> <u>Risk: officials are overwhelmed by other tasks and have a passive and non-interactive approach towards the trainings</u>	Workshop/training reports Participation lists and photos <u>Women feedback reports (training reports)</u> <u>Youth feedback reports (training reports)</u> Calculate number of staff from target institutions participating workshops/trainings <u>Collect and analyse vulnerability assessment data collected and mainstreamed in municipal plans</u> <u>Count municipal inhabitants covered by municipal plans</u>	Baseline, mid-term and end	UN-H in cooperation with EE and government
Output 1.24-2- Urban master plans at municipal level with CC and gender mainstreamed in Lebanon *In line with AF output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	No. of staff trained to respond to, and mitigate impacts of, climate-related events (in line with AF results indicator 2.1.1) through assessment and planning processes (workshops/trainings) Number of staff / people Women participating Youth participating	0 0 0	T: 240 W: >40 % Y: >15 %	<u>Assess what % of neighborhoods and populations are covered by the vulnerability assessment data collected (where collected) and proposed response actions (what locations)</u>			
<u>Municipal plans developed or modified to respond to new conditions resulting from climate variability and change</u> <u>In line with AF output 1.1: Risk and vulnerability assessments conducted and updated</u> <u>Municipal inhabitants in target areas are covered by municipal plans with climate change</u>	<u>% awareness/knowledge on the need to take gender informed decisions on climate change</u> <u>No of municipal plans with climate change mainstreamed into them based on vulnerability data developed or adapted (in line with AF results indicator 1.1)</u> <u>Percentage of municipal inhabitant in target areas</u>	0 0 0	50% 8 50 %				

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<u>mainstreamed in it, including women and Syrians</u> <u>*In line with AF output 1.2: Targeted population groups covered by adequate risk reduction systems</u>	<u>covered by the municipal plans</u> <u>Percentage of women, youth and Syrians in target areas covered by the municipal plans</u> <u>Above is in line with AF results framework indicator 1.2.1.)</u>	0	50 %				
Output 1.31-3- Urban master plans at municipal level with CC and gender mainstreamed in <u>JordanLebanon</u> <u>*In line with AF output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events</u>	No. of staff trained to respond to, and mitigate impacts of, climate-related events (in line with AF results indicator 2.1.1) through assessment and planning processes (workshops/trainings) Number of staff / people Women participating Youth participating	0 0 0	T: 450 W: >45 % Y: >15 %				
<u>Municipal plans developed or modified to respond to new conditions resulting from climate variability and change</u> <u>*In line with AF output 1.1: Risk and vulnerability assessments conducted and updated</u>	<u>No of municipal plans with climate change mainstreamed into them based on vulnerability data developed or adapted (in line with AF results indicator 1.1)</u>	0	2				
<u>Municipal inhabitants in target areas are covered by municipal plans with climate change mainstreamed in it, including women and Syrians</u> <u>*In line with AF output 1.2: Targeted population groups covered by adequate risk reduction systems</u>	<u>Percentage of municipal inhabitant in target areas covered by the municipal plans</u> <u>Percentage of women, youth and Syrians in target areas covered by the municipal plans</u> <u>Above is in line with AF results framework indicator 1.2.1.)</u>	0 0	50 % 50 %				

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Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems							
Outcome 22.1.4. Strengthened DPs and host community awareness and ownership of climate change adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures, including skills building *In line with AF outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level *In line with AF outcome 8: support the development and diffusion of innovative adaptation practices, tools and technologies	Percentage of targeted direct population aware <u>climate change and</u> appropriate responses to climate change (in line with AF results indicator 3.1) Women aware —Youth aware —Mid-term End <u>% of targeted direct population with skills enhanced using acquired climate information and knowledge to undertake, operate, maintain and replicate proposed adaptation measures</u> Innovative adaptation practices / technologies encouraged to be replicated and upscaled through replication plans (in line with AF results indicator 8)	0 0 0 0 0	W: >40 % Y: >15 % 30 % 50 % 8 (including gender consideration)	<u>Assumption: proposed adaptation measures have an impact at the district/municipal level</u> <u>Assumption: DPs and host communities including women and youth are available and interested to increase awareness about and replicate proposed climate adaptation measures</u> <u>Assumption: DPs and host communities are sensible to messages about climate-related risks and adaptation to climate change</u> Engagement of target direct population in awareness raising activities and O & M plans development	Surveys: use scale from 1 to 5 to summarize findings of analysis Replication and upscaling plans Count the number of replication and upscaling plans produced and gender consideration	Baseline, mid-term and end	UN-H in cooperation with EE and government
Output 22.1. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1: Rooftop rainwater harvesting in Lebanon *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	20 1	Ensure criteria of O & M plans and replication guidelines are clear and that 'sharing' of plans is measured	O & M plans produced and shared within the target building management and users	Baseline, mid-term and end	UN-H in cooperation with EE and government

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and learning (also applies to below outputs)							
Output 22.2. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.2: Rooftop rainwater harvesting in Jordan	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	86 1				
Output 22.3. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.3: Greywater treatment and reuse in Jordan	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	40 1				
Output 22.4. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater, incl. through wetlands, in Lebanon	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	12 (for Zahle and Wetlands) 1				

Output 22.5. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	3 (for WWTPs) 1				
Output 22.6 Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6 Water-use-efficient irrigation of treated wastewater in Lebanon	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	1 (150 ha farmland) 1				
Output 22.7. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use-efficient irrigation of treated wastewater in Lebanon	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared	0 0	1 for 220 dunum farmland) 1				
Output 22.8. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8: permaculture demonstration	No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2) Number O & M plans produced and shared Number of replication guidelines produced and shared No. of students completed permaculture curriculum with verificate	0 0 0	1 1 T: 200 W: >50 %	Calculate number of students which completed the curriculum	Certificates and / or plans developed by students	Baseline, mid-term and end	UN-H in cooperation with EE and government

	Students with certificate Women						
Output 2.9. <u>Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8: permaculture demonstration</u>	<u>No. of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2)</u> <u>Number O & M plans produced and shared</u> <u>Number of replication guidelines produced and shared</u> <u>No. of students completed permaculture curriculum with certificate</u> <u>Students with certificate Women</u>	<u>0</u> <u>0</u> <u>0</u>	<u>1</u> <u>1</u> <u>T: 200270</u> <u>W: >50 %</u>	<u>Calculate number of students which completed the curriculum</u>	<u>Certificates and / or plans developed by students</u>	<u>Baseline, mid-term and end</u>	<u>UN-H in cooperation with EE and government</u>

Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context

Outcome 3 Increased adaptive capacity within relevant development and natural resource sectors and *In Line with AF outcome 4: Increased adaptive capacity within relevant development and natural resource sectors and *In Line with AF outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas *In line with AF outcome 8: support the development and diffusion of innovative adaptation practices, tools and technologies	See outputs Ha of farmland with more sustained climate-resilient livelihoods – see outputs Innovative techniques / interventions – see outputs	See outputs
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Output 3.1. Rooftop rainwater harvesting in Lebanon *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Number of RWH systems installed Volume of rainwater collected and stored to supply safe and clean freshwater during dry periods	0	20	System must be functional, effective and satisfactory of users	Photos of systems Assess effectiveness (water harvested) and satisfactory through measurements and surveys	Baseline, mid-term and end	UN-H in cooperation with EE and government
Output 3.2. Rooftop rainwater harvesting in Jordan *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Number of RWH systems installed Volume of rainwater collected and stored to supply safe and clean freshwater during dry periods	0	86 (of which 18 rehabilitated)				
Output 3.3. Greywater treatment and reuse in Jordan *In line with AF Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Number of GWTR systems installed	0	40				

Output 3.4. Efficient treatment and reuse of wastewater, incl. through wetlands , in Lebanon *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Irrigation channels (1x1 meters with 0.25m thick walls) constructed (in meters) 18000 m3 water flow through channel from Zahle WWTP Construction of 60,000 sqm of Free Water Surface (FWS) Wetlands 6000 m3 of tributary water quality water	0 Baseline quality 0 Baseline quality	3000 meters Compliant to standard 18000 m3 60000-m2 Compliant to standard 6000-m3	Channel must be able to support 18000 m3 and comply to standards Check / assess earthworks, berms, plants, piping, pump and structures and quantity and quality of water	Quantity and quality water and channel Map / coordinates and photos Identify any visual construction weaknesses Map / coordinates and photos Quantity and quality treated		
Output 3.5. Efficient treatment and reuse of wastewater in Jordan *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Water storage constructed / installed Water quality	0 Baseline quality	1x3000 m3 1x2000 m3 Compliant to standard	Storage must be irrigatable and quality compliant to standards	Quantity and quality water and storage tanks - map / coordinates and photos		
Output 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon *In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	Treated and channeled channelled water from Zahle WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods Treated and channeled water from Bar Elias Wetlands irrigating farmland (ha) and thus sustaining	0 0	440-150 ha 40 ha	Calculate ha of farmlands being irrigated by treated wastewater	Map / coordinates and photos		

<p>*In Line with AF output 6 No and type of adaptation assets created or strengthened in support of individual or community livelihood strategies</p> <p>*In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated</p>	climate-resilience of agriculture livelihoods						
<p>Output 3.7 Water-use-efficient irrigation of treated wastewater in Jordan</p> <p>*In line with AF output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability</p> <p>*In Line with AF output 6 No and type of adaptation assets created or strengthened in support of individual or community livelihood strategies</p> <p>*In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated</p>	<p>Conveyor irrigation pipeline 6' size installed (in meters)</p> <p>Treated and stored channeled water from Maered WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods</p> <p>Treated and stored channeled water from Al Kaider WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods</p> <p>Treated and channeled water from Mafraq WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods</p> <p>Treated and channeled water from small ponds and thus sustaining climate-resilience of agriculture livelihoods</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>4000m</p> <p>60 dunum</p> <p>60 dunum</p> <p>100 dunum</p> <p>15 ponds</p>	<p>Calculate number of ponds</p>			
<p>Output 3.8 Permaculture demonstration</p> <p>*In line with AF output 4: Vulnerable physical,</p>	<p>Permaculture demonstration site established, including: Biofertilizer site Crop garden and compost egg laying chickens (30 chickens)</p>	<p>0</p> <p>0</p>	<p>1</p> <p>30 chickens</p>	<p>Calculate numbers</p> <p>Assess effectiveness of reducing water use</p>	<p>Map / coordinates and photos</p> <p>Assess reduction water use (soil moist)</p>		

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natural, and social assets strengthened in response to climate change impacts, including variability *In line with AF output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	Beehives Compost sub-od worm farms Olive trees (Orchard Monoculture Conversion to Food Forest)	0 0 0 <u>Q</u>	3 5 180 <u>1</u>				
Output 3.9. Permaculture demonstration *In line with AF output 4: <u>Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability</u> *In line with AF output 8: <u>Viable innovations are rolled-out scaled up, encouraged and / or accelerated</u>	<u>Permaculture demonstration site established, including:</u> - <u>Agricultural Waste Management for Sustainable Crop Production</u> - <u>Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures</u> - <u>Apiculture and the reduction of chemical substance use at farm level</u> - <u>Introducing adapted crop varieties and diversifying farm production</u>	<u>Q</u> <u>Q</u> <u>Q</u> <u>Q</u>	<u>30X</u> <u>20X</u> <u>80X</u> <u>~10</u>	<u>Calculate numbers</u> <u>Assess effectiveness of reducing water use</u>	<u>Map / coordinates and photos</u> <u>Assess reduction water use (soil moist)</u>		
Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)							
Outcome 4.1.1. Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally *In line with AF outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	<u>Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning</u> <u>Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses (in line with AF results indicator 3.24)</u> <u>% increased of gender-sensitive good practices /lessons learnt per country at national and city level that are shared</u>	<u>Q</u> <u>Q</u>	<u>50 %</u> <u>30 %</u>	<u>Assumptions: Countries are keen to share experience and learn from each other's</u> <u>Assess what % of the SG and relevant ministry staff is aware of predicted adverse impacts of climate change, and of appropriate responses</u>	<u>Survey to assess awareness</u> <u>Content of the good practices disseminated and shared</u> <u>Survey to assess awareness of the good practices shared</u>	<u>Baseline, mid-term and end</u>	<u>UN-Habitat</u>

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Output 4.1. Regional / international KM with focus on sharing project lessons and replication *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Number of technical committees formed to ensure transfer of knowledge (in line with AF results indicator 3.2.1.) Regional steering committee formed National steering committees formed Number of tools and guidelines developed and shared with relevant stakeholders <u>through the CoP</u> (in line with AF results indicator 3.2.2). Project video developed and shared with relevant stakeholders <u>Presentations given / shared at events</u> <u>No. of good practices per city shared</u> <u>Number of regional workshops held</u>	0 0 0 0 0 0	1 5 4 2 1 5	<u>Assumption: countries are keen to be part of the CoP, learn from each other and share good practices</u> <u>Steering committee members will share knowledge through international events</u> <u>Risk: organizational and bureaucratic delays in organizing regional workshops</u> <u>Risk: weak interaction between the CoP members</u> <u>Risk: Political factors might limit the engagement of some countries and cities</u> <u>Risk: delay in documenting and sharing good practices among the countries and receiving feedback</u>	<u>Content of the good practices disseminated and shared</u> <u>Survey to assess awareness of the good practices shared</u> <u>ToR-committees and meetings</u> <u>Agenda, minutes and photos of meetings and workshops.-</u> <u>to events monitored; Photos and agenda</u> Video online <u>Content of new/revised municipal plans</u> <u>Field visits reports and agenda</u> <u>Field visits feedback reports</u> <u>Presentation + audience type and number</u>	Baseline, mid-term and end	UN-Habitat
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	<u>See above</u> <u>Nr. of municipal plans on gender sensitive climate adaptation that have been developed/revised (for incorporating the good practices)</u> <u>Nr. of bilateral city-to-city meetings held among Jordan and Lebanon on gender sensitive climate adaptation practices</u> <u>No. of field visits conducted and lessons learned shared</u> <u>No. of field visits exchanged with a focus on gender and climate change</u> <u>No. of participants to the visits (gender disaggregated</u>	0 0 0 0	8 (6 in Lebanon and 2 in Jordan) At least 6 exchange in both countries 4 20 (50 % Women)	 <u>Risk: lack of interest/ support/participation in field visits by countries</u> <u>Risk: limited participation of women in field visits</u> <u>Risk: logistic delays in organizing field visits by countries</u>			

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Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Regional' urban risks and vulnerabilities assessment, planning and management approach model developed and shared No of views of the online modules Presentations of the model given / shared at events and webinars % increased interest in applying the model in other cities/countries % increased awareness of the content of the module	0 0 0 0 0	1 (with gender consideration) 500 5 30 % 30 %	Assumption: Steering committee members will share knowledge through international events including planning approach, best practices, etc. Risk: lack of interest in online modules and webinar Risk: logistics issues limiting accessibility to the modules and webinars	Online and presented Presentation + audience type and number in events Online feedback for the modules and webinar from the participants Content of the model shared	4 th year	UN-H in cooperation with EE and government
Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities *In line with AF Output 3.2: strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities developed/published and shared % increased interest in replicating upscale rainwater harvesting in other cities in Jordan	0 0	1 30 %	With a focus on Jordan			

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Table 27 Indicative Core Indicator Targets

Impact-level results	Core indicator	Disaggregated data and targets	Comment
Increased adaptive capacity of communities to respond to the impacts of climate change	Number of beneficiaries (direct) Component 1 and 2	Total: 930 Women: >40 % Youth: >15 %	Direct beneficiary numbers in overview table 6 include all project activities, while those in the results frameworks focus on specific activities such as O & M.
	Number of beneficiaries (direct) Component 3	Total: 101 13,588 Women: 69% Youth: 34 % Syrian: 41 %	Indirect beneficiaries, see also project overview table 6
	Number of beneficiaries (direct) Component 4	Total: 157,309 19,424 Women: 69% Youth: 33 % Syrian: 42 %	All 'concrete' adaptation activities are designed to increase climate change-related water scarcity resilience
	Number of beneficiaries (direct) Component 5	T: 600 W: >40 % Y: >15 %	The 'concrete' adaptation activities related to the WWTPs and irrigation interventions are designed to support increased resilience of the agriculture livelihoods
	Assets produced, developed, improved, or strengthened RWH systems GWRT systems 3km irrigation channel Zahle WWTP treated water irrigated through channel Wetlands constructed Water storage constructed / installed Modern / water efficient irrigations systems Permaculture demonstration site	106 40 1 1 (18000 m3 of water) 1 (60,000 m3 with 6000 m3 water flow 2 (1x2000 m and 1x3000 m3) 5 (one covering 150 ha; one covering 40 ha; 2 covering 60 dunum; 1 covering 100 dunum)	
	Increased income, or avoided decrease in income	See ha of farmland being more water stress resilient, thus sustaining resilient agriculture livelihoods	

Methodology to apply: <https://www.adaptation-fund.org/wp-content/uploads/2016/04/AF-Core-Indicator-Methodologies.pdf>

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F. Project alignment with the Adaptation Fund results framework

Table 28 Project alignment with the Adaptation Fund results framework

Project Outcome	Project Outcome Indicator	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
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<p>Outcome 1 Strengthened municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries</p> <p><u>Reduced exposure to climate-related hazards and threats at the municipal level</u></p>	<p>No and type of targeted institutions with strategies / guidelines and urban master plans with climate change and gender mainstreamed. Number of strategies / guidelines (district-national level) Number of urban master plans in Lebanon Number of urban master plans in Jordan</p> <p>Relevant threat and hazard information generated and disseminated through to stakeholders on a timely basis (in line with AF results indicator 1) Municipal plans with climate change mainstreamed in it disseminated during project</p>	<p>Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses</p> <p>Outcome 1 Reduced exposure to climate-related hazards and threats</p>	<p><u>2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased</u></p> <p><u>1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis</u></p>	1,341,000
<p>Outcome 22.1.1. Strengthened DPs and host community awareness and ownership of CC adaptation measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures</p>	<p>Percentage of targeted direct population aware of adaptation measures being implemented Women participating Youth participating</p> <p>Technologies replication and upscaling plans</p>	<p>Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level</p> <p>Outcome 8: support the development and diffusion of innovative adaptation practices, tools and technologies</p>	<p>3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses</p> <p>8. Innovations adaptation practices are rolled-out, scaled up, encouraged and / or accelerated at regional, national and / or subnational level</p>	<p>1,8781,6703 3,200</p>
<p>Outcome 3 3.1.1. Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context and benefitting vulnerable groups</p>	<p>See outputs</p> <p>See outputs</p>	<p>Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors</p> <p>Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas</p>	<p>4.1. Development sectors' services responsive to evolving needs from changing and variable climate 4.2. Physical infrastructure improved to withstand climate change and variability-induced stress</p> <p>6.1 Percentage of households and communities having more secure (increased) access to livelihood assets 6.2. Percentage of targeted population with sustained climate-resilient livelihoods</p>	<p>7,509,7678, 048,227</p>
<p>Outcome 44.1.1. Strengthened</p>	<p><u>Strengthened capacity of national and subnational</u></p>	<p>Outcome 3: Strengthened</p>	<p>3.1. Percentage of targeted population</p>	<p>888,462923, 162</p>

(inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally	stakeholders and entities to capture and disseminate knowledge and learning Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses (in line with AF results indicator 3.24) % increased of gender-sensitive good practices /lessons learnt per country at national and city level that are shared. See outputs	awareness and ownership of adaptation and climate risk reduction processes at local level	aware of predicted adverse impacts of climate change, and of appropriate responses	
	Technologies replication and upscaling plans	Outcome 8: support the development and diffusion of innovative adaptation practices, tools and technologies	8. Innovations adaptation practices are rolled-out, scaled up, encouraged and / or accelerated at regional, national and / or subnational level	
Project Output	Project Output Indicator	Fund Output	Fund Output Indicator	Grant Amount (USD)
Output 41.1 Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon	No of municipal plans with-with climate change mainstreamed into them; based on vulnerability data developed or adapted collected	Output 1.1 Risk and vulnerability assessments conducted and updated	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)	249,000
Output 1.2. Urban master plans developed or modified at municipal level with CC and gender mainstreamed (respond to new conditions resulting from climate variability and change) in Lebanon	Percentage of municipal inhabitant in target areas covered by the municipal plans Percentage of women, youth and Syrians in target areas covered by the municipal plans No. of staff and population directly involved in assessment and planning processes through workshops/trainings Number of staff / people Women participating Youth participating	Output 1.2. Targeted population groups covered by adequate risk reduction systems Output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	1.2.1. Percentage of target population covered by adequate risk-reduction systems 2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	530366,000
Output 1.3. Urban master plans developed or modified at municipal level with CC and gender mainstreamed (respond to new conditions resulting from climate variability and change) in Jordan				562366,000
Output 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8, 2.9 Strengthened DPs and host community awareness and ownership of climate change adaptation	No. of O & M plans and staff and population directly involved with development of these plans Total staff / population: Women participating Youth participating No. of students completed permaculture curriculum	Output 3.2 Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and	3.2.2 No of tools and guidelines developed and shared with relevant stakeholders	500360,000 Approx - see details in budget notes) 170,000

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measures + capacities strengthened to operate, maintain and replicate proposed adaptation measures	Total students Women	learning		
Output 3.1. Rooftop rainwater harvesting in Lebanon	Number of RWH systems installed	Output 4: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability Output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change 6.1. No and type of adaptation assets created or strengthened in support of individual or community livelihood strategies 8.1 No of innovative adaptation practices, tools and technologies accelerated, scaled-up and / or replicated	<u>8,048,2277,</u> <u>509.767</u>
Output 3.2. Rooftop rainwater harvesting in Jordan	Number of RWH systems installed			
Output 3.3. Greywater treatment and reuse in Jordan	Number of GWTR systems installed			
Output 3.4. Efficient treatment and reuse of wastewater, incl. through wetlands , in Lebanon	Irrigation channels (1x1 meters with 0.25m thick walls) constructed (in meters) 18000 m3 water flow through channel from Zahle WWTP Construction of 60,000 sqm of Free Water Surface (FWS) Wetlands 6000 m3 of tributary water quality water			
Output 3.5. Efficient treatment and reuse of wastewater in Jordan	Water storage constructed / installed Water quality			
Output 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon	Treated and channeled water from Zahle WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods; Treated and channeled water from Bar Elias Wetlands irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods			
Output 3.7 Water-use-efficient irrigation of treated wastewater in Jordan	Conveyor irrigation pipeline 6' size installed (in meters) Treated and stored channeled water from Maered WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods; Treated and stored channeled water from Al Kaider WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods; Treated and channeled water from Mafraq WWTP irrigating farmland (ha) and thus sustaining climate-resilience of agriculture livelihoods Treated and channeled water from small ponds and thus			

	sustaining climate-resilience of agriculture livelihoods			
Output 3.8. Permaculture demonstration	Permaculture demonstration site established, including: Biofertilizer site Crop garden and compost egg laying chickens (30 chickens) Beehives Compost sub-od worm farms Olive trees (Orchard Monoculture Conversion to Food Forest)			
Output 3.9 <u>Permaculture demonstration</u>	<u>Permaculture demonstration site established, including:</u> - <u>Agricultural Waste Management for Sustainable Crop Production</u> - <u>Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures</u> - <u>Apiculture and the reduction of chemical substance use at farm level</u> - <u>Introducing adapted crop varieties and diversifying farm production</u>			
Output 4.1. Regional / international KM with focus on sharing project lessons and replication	Number of technical committees formed to ensure transfer of knowledge (in line with AF results indicator 3.2.1.) Regional steering committee formed National steering committees formed Number of tools and guidelines developed and shared with relevant stakeholders <u>through the CoP</u> (in line with AF results indicator 3.2.2). Project video developed and shared with relevant stakeholders <u>Presentations given / shared at events</u> <u>Nb of good practices per city shared</u> <u>Number of regional workshops held</u>	Output 3.2 Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning Output 8: Viable innovations are rolled-out scaled up, encouraged and / or accelerated	3.2.2 No of tools and guidelines developed and shared with relevant stakeholders 8.1 No of innovative adaptation practices, tools and technologies accelerated, scaled-up and / or replicated	<u>888,462,923,162</u>
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned	<u>See above</u> <u>Nr. of municipal plans on gender sensitive climate adaptation that have been developed/revised (for incorporating the good practices)</u> <u>Nr. of bilateral city-to-city meetings held among Jordan and Lebanon on gender sensitive climate adaptation practices</u> <u>No. of field visits conducted and lessons learned shared</u> <u>No. of field visits exchanged with a focus on gender and climate change</u> <u>No. of participants to the visits (gender disaggregated)</u>			

Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Regional' urban risks and vulnerabilities assessment, planning and management approach model developed and shared Nb of views of the online modules Presentations of the model given / shared at events and webinars % increased interest in applying the model in other cities/countries % increased awareness of the content of the module			
Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	Number of tools and guidelines developed and shared with relevant stakeholders (in line with AF results indicator 3.2.2). Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities developed/published and shared increased interest in replicating upscale rainwater harvesting in other cities in Jordan			

G. Detailed budget

Table 29 Detailed Budget. For all budget notes, see annex 6

Project Components	Expected Concrete Outputs	Expected Concrete Outcomes	TOTAL	Year	Year	Year	Year
				1	2	3	4
				12 m	12 m	12 m	12 m
Component 1 Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, including DPs migration trends	Output 1.1. Territorial planning and development strategy / guidelines with CC and gender mainstreamed in Lebanon	Outcome 1.1 Strengthen municipal institutional capacity to manage climate change and DP crisis related urban water scarcity challenges by mainstreaming these aspects into spatial strategies + developing action / investment plans and guidelines (with identified solutions) to use water most efficiently within municipal boundaries	249,000	249,000	-	-	-
	Output 1.2. Urban master plans at municipal level with CC and gender mainstreamed in Lebanon		530,000	260,000	241,000	17,000	12,000
	Output 1.3. Urban master plans at municipal level with CC and gender mainstreamed in Jordan		562,000	267,000	237,000	34,000	24,000
	TOTAL		1,341,000	776,000	478,000	51,000	36,000
Component 2 Improve awareness, ownership and capacities to respond to climate change impacts, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems	Output 2.1. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.1	Outcome 2.1 Strengthened DPs and host communities awareness and ownership of CC adaptation measures + capacities strengthened to operate and maintain proposed adaptation measures, including skills building	195,400	36,700	51,750	54,750	52,200
	Output 2.2. See above for output 3.2.		139,200	31,200	43,500	46,500	18,000
	Output 2.3. See above for output 3.3.		234,000	36,000	82,000	82,000	34,000
	Output 2.4. See above for output 3.4.		163,200	61,300	29,900	56,850	15,150
	Output 2.5. See above for output 3.5.		16,000	-	-	6,000	10,000
	Output 2.6. See above for output 3.6.		142,100	39,150	28,150	58,150	16,650
	Output 2.7. See above for output 3.7.		259,000	90,400	83,800	32,400	52,400
	Output 2.8. See above for output 3.8.		314,600	113,000	66,200	65,200	70,200
	Output 2.9. See above for output 3.8.		418,170	123,157	125,457	117,457	52,100
	TOTAL		1,881,670	530,907	510,757	519,307	320,700
Component 3 Expand climate change resilient (unconventional) water harvesting and supply options, using innovative, low-cost and replicable techniques	Output 3.1. Rooftop rainwater harvesting in Lebanon	Outcome 3.1 Increased adaptive capacity within the water sector through resilient and sustainable water harvesting, supply and irrigation options, using innovative and cost-effective techniques suitable for the context and replicable and benefitting vulnerable groups	867,262	11,364	400,767	443,767	11,364
	Output 3.2. Rooftop rainwater harvesting in Jordan		836,820	5,000	471,410	355,410	5,000
	Output 3.3. Greywater treatment and reuse in Jordan		843,112	11,364	410,192	410,192	11,364
	Output 3.4. Efficient treatment and reuse of wastewater, incl. through wetlands , in Lebanon		846,120	16,224	829,896	-	-
	Output 3.5. Efficient treatment and reuse of wastewater in Jordan		1,053,332	-	1,053,332	-	-
	Output 3.6. Water-use-efficient irrigation of treated wastewater in Lebanon		988,950	6,600	497,775	484,575	-
	Output 3.7. Water-use Efficient irrigation of treated wastewater in Jordan		804,400	10,800	780,400	6,600	6,600

	Output 3.8. Permaculture demonstration - closed loop efficient water use system in Jordan		384,046	210,289	57,919	57,919	57,919
	Output 3.9. Permaculture demonstration - closed loop efficient water use system in Lebanon		885,725	307,080	236,975	187,710	153,960
	TOTAL		7,509,767	578,721	4,738,666	1,946,173	246,207
Component 4 Project Knowledge management and replication and development of regional urban risks and vulnerabilities management approach model	Output 4.1. Regional / international KM with focus on sharing project lessons and replication	Outcome 4.1 Strengthened (inter)National institutional capacity to manage climate change and DP crisis related urban water scarcity challenges, including lessons learned collected and shared regionally	280,000	45,000	35,000	95,000	105,000
	Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons learned		437,800	110,620	105,280	96,180	125,720
	Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities		165,000	-	68,000	20,000	77,000
	Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities		40,362	-	-	36,000	4,362
	TOTAL		923,162	155,620	208,280	247,180	312,082
	Sub-total Project Components Costs			11,655,599	2,041,248	5,935,703	2,763,660
Project Execution Costs	Regional Project coordination		264,000	66,000	66,000	66,000	66,000
	National Project execution		827,400	227,100	218,100	191,100	191,100
	Travel Related to Execution		37,810	10,543	8,362	8,362	10,543
	Operations		69,000	15,000	15,000	15,000	24,000
	Terminal evaluation		25,000	-	-	-	25,000
Sub-total Project Execution Costs		9.50%	1,223,210	318,643	307,462	280,462	316,643
SUB-TOTAL Component + execution fee			12,878,809	2,359,891	6,243,165	3,044,122	1,231,632
Project Cycle Management Fee	UN-H ROAS Project Support Costs: AF and UN-H policies compliance Progress / evaluation Travel	1.50%	193,182	35,398	93,647	45,662	18,474
	UN-H HQ Project Support Costs: Overall project supervision, incl. compliance to UN-H policies and standards (gender, human rights, climate change, etc.)	7.00%	901,517	165,192	437,022	213,089	86,214
Sub-total Project Cycle Management Fee		8.50%	1,094,699	200,591	530,669	258,750	104,689
Amount of Financing Requested			13,973,508	2,560,481	6,773,834	3,302,872	1,336,321

For an overview of milestones, see annex 7

Table 30: M & E budget

M&E								
Type of M & E Activity	Activity	Entity	Row	Total	1	2	3	4
Measurements of means of verification (baseline assessment and M & E plans) as part of inception	Workshop	UN-ESCWA		20,000	20,000			
	Reports preparation and EE compliance to AF ESP and GP	UN-H ROAS		29,499	29,499			
Direct Project Monitoring and Quality Assurance including annual progress and financial reporting, project revisions, technical assistance and ESP and GP compliance (from execution fee M & E and safeguards)	M & E UN-H offices	UN-H National offcies		100,800	25,200	25,200	25,200	25,200
Overall project monitoring and evaluation (from cycle management fee)		UN-H ROAS		32,197	5,900	15,608	7,610	3,079
Audits	In line with AF requirements	OIOS		-	-	-	-	-
Terminal external evaluation		Independent		25,000				25,000
Total				207,496	80,598	40,808	32,810	53,279

From Project Execution fee	100,800	25,200	25,200	25,200	25,200
From Project Cycle Management fee	61,696	35,398	15,608	7,610	3,079

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H. Disbursement schedule

Table 31 Disbursement schedule

	Year 1	Year 2	Year 3	Year 4
Schedule	1 st disbursement –	2 nd disbursement – One Year after project inception	3 rd disbursement - Two years after project inception	4 th disbursement – Three years after project inception
Milestones	Milestones Upon agreement signature	Milestones (by end of year): Upon First Annual Report Upon financial report indicating disbursement of at least 70% of funds of 1 st year	Milestones (by end of year) Upon Second Annual Report Upon financial report indicating disbursement of at least 70% of funds of 2 nd year	Milestones (by end of year) Upon Third Annual Report Upon financial report indicating disbursement of at least 70% of funds of 3 rd year

Schedule date	Upon Signing	One Year after project inception	Two years after project inception	Three years after project inception
A. Project Funds (US\$)	<u>2,041,248</u> 4,562,578	<u>5,935,703</u> 7,214,952	<u>2,763,660</u> 2,168,272	<u>914,989</u> 704,787
B. Programme Execution (US\$)	<u>318,643</u> 315,443	<u>307,462</u> 300,943	<u>280,462</u> 279,443	<u>316,643</u> 327,443
C. Programme Cycle Mgt (US\$)	<u>200,591</u> 159,634	<u>530,669</u> 638,854	<u>258,750</u> 208,056	<u>104,689</u> 87,740
TOTAL (US\$)	2,560,481	6,773,834	3,302,872	1,336,321

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PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government¹⁰¹

<i>Saleh Al-Kharabsheh Minister, Ministry of Environment, Jordan</i>	<i>Date: January 22, 2020</i>
<i>Fadi Jreissati, Minister, Ministry of Environment, Lebanon</i>	<i>Date: January 20, 2020</i>

¹⁰¹ Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.



Ministry of Environment

Ref.No 7.2-776
Date 22-1-2020

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for "Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon".

In my capacity as designated authority for the Adaptation Fund in Jordan, I confirm that the above regional project/programme proposal is in accordance with the government's national and regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Jordan. The project aligns specifically with Jordan's climate change policy and Intended Nationally Determined Contributions (INDC). The regional approach shall also improve management of water challenges and pressure on resources regionally and foster our cooperation with Lebanon, including under the Regional Refugee and Resilience Plan 2020- 2021.

Also, the Ministry of Environment reviewed and approved the Environmental and Social Impact Assessment and the Environmental Risk Management and Monitoring Plan that was submitted by UN-Habitat as part of this project.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by UN-Habitat and executed in Jordan by the mentioned entities in the proposal document.

Sincerely,


Minister of Environment

Dr. Saleh Al-Kharabsheh

THE HASHEMITE KINGDOM OF JORDAN

TEL : +962 6 5560113 FAX : +962 6 5516377 P.O.Box : 1408 AMMAN 11941 JORDAN www.moenv.gov.jo



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT
THE MINISTER

Beirut, 20/01/2020
Our Ref.: 4206/B/2018

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for "Increasing the resilience of both displaced persons and host communities to climate change-related water challenges in Jordan and Lebanon"

In my capacity as designated authority for the Adaptation Fund in Lebanon, I confirm that the above regional project/programme proposal is in accordance with the government's national and regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Lebanon. The project aligns specifically with Lebanon's climate change policy and Intended Nationally Determined Contributions (INDC). The regional approach shall also improve management of water challenges and pressure on resources regionally and foster our cooperation with Jordan, including under the Regional Refugee and Resilience Plan 2020- 2021.

Also, the Ministry of Environment reviewed and approved the Environmental and Social Impact Assessment and the Environmental Risk Management and Monitoring Plan that was submitted by UN-Habitat with the exception of the Constructed Wetlands' which is still under review (EIA report approval pending).

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by UN-Habitat and executed in Lebanon by UNICEF, Litani River Authority (LRA), Bekaa Water Establishment (BWE), and Lebanese Agricultural Research Institute (LARI).

Sincerely,

AA-F-16-V-1-111

Minister of Environment
Fady Jreissati



Cc: - Ministry of Energy and Water, Bekaa Water Establishment, Litani River Authority
- Ministry of Agriculture, Minister, Lebanese Agricultural Research Institute
- Mr. Samir Malek, UNFCCC Focal Point, Service of Environmental Technology, MoE
- Ms. Nancy Khoury, Head of Department of Public Relations and External Affairs, MoE
- Mr. Yehia Kabakian, Climate Change Advisor, Climate Change Projects, MoE

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans in Jordan and Lebanon, including INDC, NAP, TNCs and the regional 3RP, subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

Raf Tuts
Director, Global Solutions Division, UN-Habitat
Implementing Entity Coordinator

Date: 04/17/2020

Tel. +254-20-762-3726

E-mail: raf.tuts@un.org

Project Contact Person: Erfan Ali and Soha Farouk, Regional office for Arab States

Email: erfan.ali@un.org soha.farouk@un.org

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans in Jordan and Lebanon, including INDCs, NAP, TNCs and the regional 3RP, subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.



Raf Tuts,
Director, Global Solutions Division,
UN-Habitat

Date: 17th January 2020

Tel.: +254-20-762-3736;

E-Mail: raf.tuts@un.org

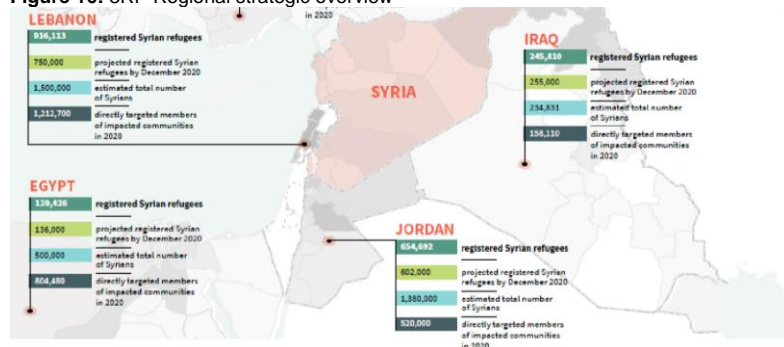
Project Contact Person: Erfan Ali and Soha Farouk, Regional Office for Arab States

E-Mail: erfan.ali@un.org soha.farouk@un.org

ANNEX 1: Refugee crisis statistics and project alignment with 3RP (regional refugee and resilience plan)¹⁰² and climate change scenarios and vulnerabilities in project target areas.

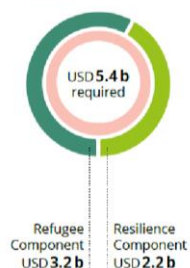
Below figures show a need for funding for increasing the resilience of DPs / refugees, including for the WASH sector, which will be impacted by climate change, especially in Jordan and Lebanon. It also show the current numbers of refugees registered, those between 2013-2020 and the geographical location (which shows most are in the project target locations).

Figure 16: 3RP Regional strategic overview



¹⁰² <https://data2.unhcr.org/en/documents/download/67370>

TOTAL REQUIREMENTS 2020

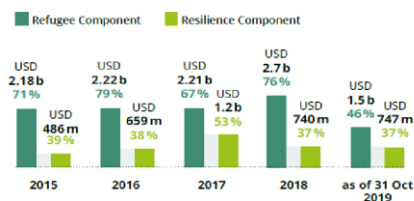


FINANCIAL REQUIREMENTS

COUNTRY	Refugee Component (USD)	Resilience Component (USD)	Total Requirements 2020 (USD)	Estimated Total Needs 2021 (USD)
TURKEY	554,009,139	620,919,147	1,174,928,285	973,000,000
LEBANON	1,363,938,455	1,310,450,672	2,674,389,127	TBC
JORDAN	913,505,965	161,989,717	1,075,495,682	TBC
IRAQ	173,209,275	86,733,027	259,942,303	241,023,436
EGYPT	121,851,102	32,312,103	154,163,205	166,983,477
REGIONAL	92,970,742	3,000,000	95,970,742	TBC
TOTAL	3,219,992,177	2,214,897,167	5,434,889,344	TBC

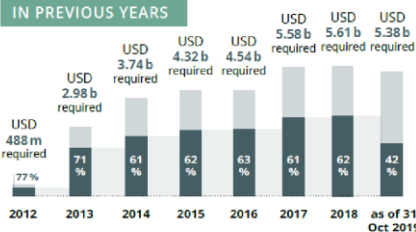
NOTE: All figures subject to change pending finalization/ release/launch of the 3RP country chapters. Jordan figures are pending review by the Government of Jordan and therefore may be subject to change in due course. The total requirements 2020 figure does not include the appeal requirements of the government in Jordan (JRP) or Lebanon (LCRP).

REFUGEE & RESILIENCE COMPONENT FUNDING RECEIVED



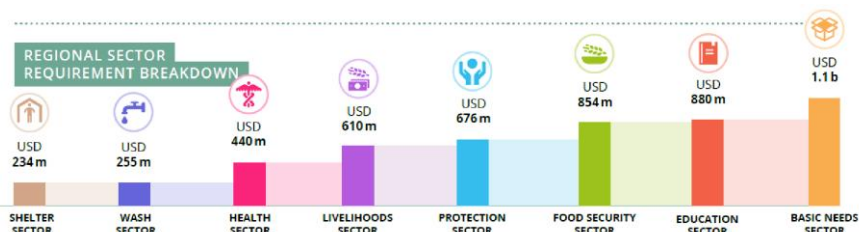
NOTE: The percentages of component funded against component requirements.

APPEAL VS FUNDING IN PREVIOUS YEARS



NOTE: This graphic covers funding under the 3RP since 2015 and its predecessors, the Refugee Response Plans (RRPs), since 2012.

REGIONAL SECTOR REQUIREMENT BREAKDOWN



NOTE: This does not include regional funding requirements and some other country-level requirements which have not yet been allocated a sector.

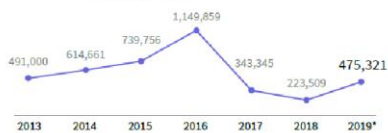


WASH SECTOR

2020 Requirements in USD	254,549,666
Targeted Population	2,119,800
Number of Partners	64

Reach in previous years

Number of individuals benefitted from access to adequate latrines

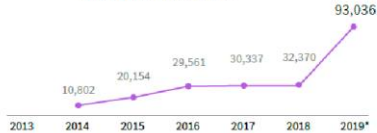


LIVELIHOODS & SOCIAL COHESION SECTOR

2020 Requirements in USD	610,276,633
Targeted Population	850,200
Number of Partners	211

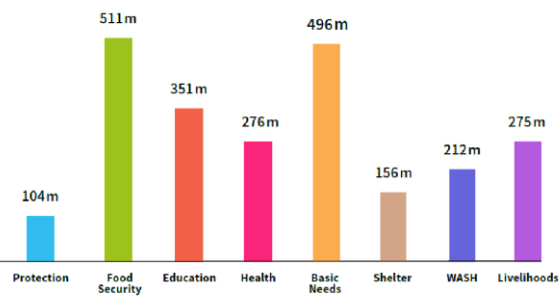
Reach in previous years

Number of individuals assisted to access wage employment opportunities



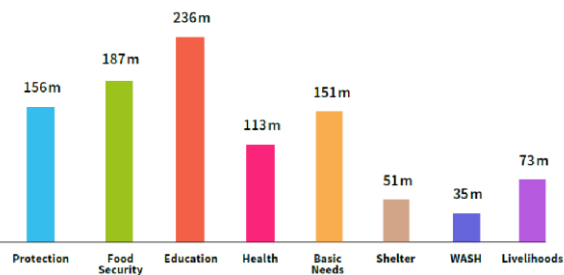
LEBANON

FUNDING REQUIREMENTS



JORDAN

FUNDING REQUIREMENTS



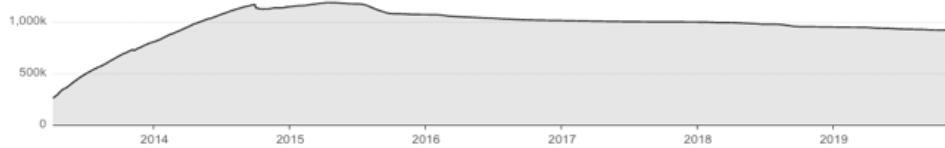
NOTE: Jordan figures are pending review by the Government of Jordan and therefore may be subject to change in due course.

DPs in Lebanon¹⁰³

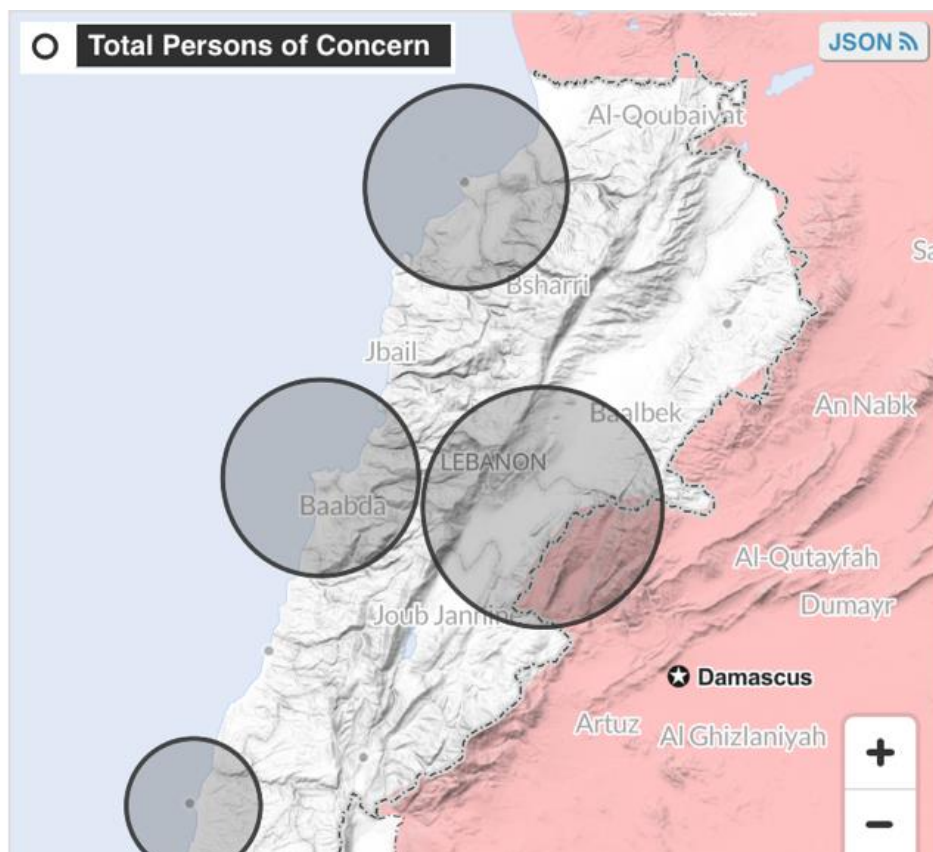
Total Persons of Concern: 918,974

Location name	Source	Data date		Population
Bekaa	UNHCR	31 Oct 2019	<div></div> 37.3%	342,875
North Lebanon	UNHCR	31 Oct 2019	<div></div> 26.5%	243,125
Beirut	UNHCR	31 Oct 2019	<div></div> 24.8%	228,009
South Lebanon	UNHCR	31 Oct 2019	<div></div> 11.4%	104,965

Registered



¹⁰³ https://data2.unhcr.org/en/situations/syria/location/71#_ga=2.248854471.1978193527.1540994637-1966626473.1540994637



DPs in Jordan¹⁰⁴

Total Persons of Concern : **654,192**

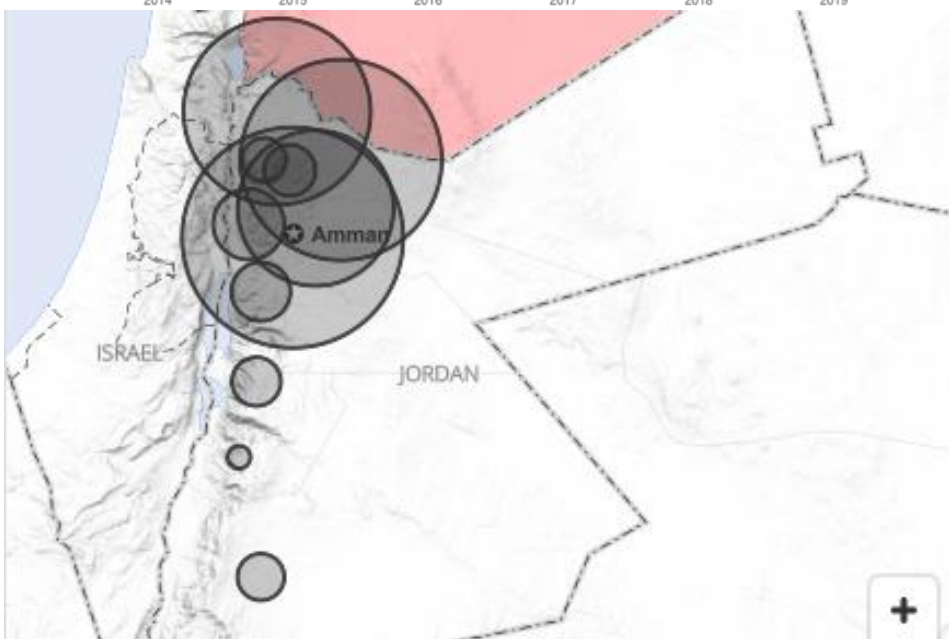
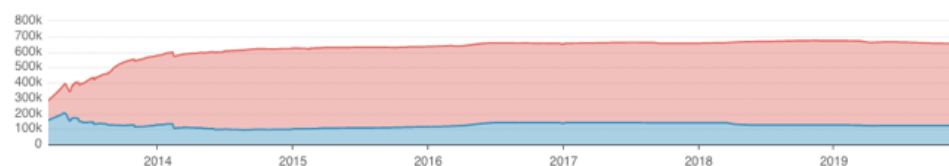
¹⁰⁴ https://data2.unhcr.org/en/situations/syria/location/36#_ga=2.22371195.1978193527.1540994637-1966626473.1540994637

Location name	Source	Data date	Population
Amman Governorate	UNHCR	1 Dec 2019	29.5% 192,667
Mafrq Governorate	UNHCR	1 Dec 2019	24.8% 161,933
Irbid Governorate	UNHCR	1 Dec 2019	20.6% 134,585
Zarqa Governorate	UNHCR	1 Dec 2019	14.5% 94,619
Balqa Governorate	UNHCR	1 Dec 2019	2.8% 18,446
Madaba Governorate	UNHCR	1 Dec 2019	2.0% 13,096
Jarash Governorate	UNHCR	1 Dec 2019	1.4% 9,301
Karak Govenorate	UNHCR	1 Dec 2019	1.3% 8,526
Maan Governorate	UNHCR	1 Dec 2019	1.3% 8,376
Ajlun Governorate	UNHCR	1 Dec 2019	1.0% 6,590
Aqaba Governorate	UNHCR	1 Dec 2019	0.6% 3,621
Tafilah Govenorate	UNHCR	1 Dec 2019	0.3% 1,738

Refugees from Syria by date

[.CSV](#) [JSON](#)

■ Total Urban, Peri-Urban and Rural population ■ Refugee Camps



Jordan climate change scenarios and vulnerabilities in project target area

Multiple climate scenario modeling and vulnerability assessment studies have been conducted for Jordan in the last 10 years. Additional to the "formal" climate scenario modeling and vulnerability assessment study conducted as part of the latest Third National Communication Report of Jordan to UNFCCC

(2014)¹⁰⁵, which simulated general or country-wide level of climate scenario modeling and vulnerability assessment and will be used here for general-level remarks, there are two more site-specific climate modeling studies, which are considered almost directly (Wade et al. 2010¹⁰⁶) and 100% directly (Hammouri et al. 2016¹⁰⁷/Hammouri 2009¹⁰⁸) representative studies to the locations of the interventions of this proposal.

(1) THIRD NATIONAL COMMUNICATION (TNC) REPORT'S (2014) CLIMATE SCENARIO MODELING AND VULNERABILITY ASSESSMENT

According to the TNC (2014) climate scenario modeling and vulnerability assessment, and based on long historical data obtained from Jordan Metrology Department (JMD), climatic variables at all over the country are changing significantly at both national and station level, indicating that climate change is becoming more apparent. Both the Mann-Kendall rank trend test and linear regression trends indicate that the annual precipitation tends to decrease significantly with time at a rate of 1.2 mm per year. In addition, the historic data tested in both annual and monthly basis indicated that precipitation reduction is highly significant during the whole rainy season except for January. Similarly during the dry seasons of June, July and August, the precipitation has tended to increase over time, although this increase is considered negligible in its quantity as indicated by the magnitude of the slope. Interpolated spatial maps shows the locations of these changes to be more apparent at both northern and southern parts. Simultaneously, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively.

Dynamic downscaling for this study was achieved using Africa CORDEX domain, in which 43 grid points with 50 km resolution were crossed throughout the country. Nine different GCM coupled with two RCMs for two RCPs (4.5 and 8.5) were used to assess future projections as compared to reference historic data (1980-2010). Three time horizons were selected; 2020-2050, 2040-2070, and 2070-2100.

The projections' results totally agree with previous work of Second National Communication (SNC¹⁰⁹) to UNFCCC and are consistent with IPCC-AR5. For the year 2085, the two RCPs extremely likely predicted rise in mean temperature for all of the country, up +2.1°C [+1.7 to +3.1°C] for RCP 4.5, and +4°C [3.8-5.1°C] for RCP 8. The increase was predicted to be homogeneous for the RCP 4.5, and stronger for the Eastern and the Southern regions for RCP 8.5. Future dynamic projections predict extremely likely warmer summer compared to other seasons.

Compared to the SNC that used CMIP3 results, multiensemble projections of CMIP5 results coupled with regional climate models in CORDEX give a more consistent trend to a likely drier climate. In 2070-2100, the cumulated precipitation could likely decrease by 15% [-6% to -25%] in RCP 4.5, by - 21% [-9% to -35%] in RCP 8.5. The decrease would be more marked in the western part of the country.

It is more likely to have drier autumn and winter as compared to spring, with a median value of precipitation decrease reaching -35% in autumn in 2070-2100.

Also, the dynamic projections predict more extremely likely heat waves where the analysis of summer temperature, monthly values and the inter-annual variability reveal that some thresholds could be exceeded especially for a summer month where the average of maximum temperature for the whole country could exceed 42-44°C.

¹⁰⁵ Third National Communication Report of Jordan to UNFCCC (2014), UNDP and Jordan Ministry of Environment.

¹⁰⁶ Wade, A., Black, E., Brayshaw, D., El-Bastawesy, M., Holmes, P., Butterfield, D., Nuimat, S., and Janjoun, K. 2010, 'A model-based assessment of the effects of projected climate change on the water resources of Jordan', *Philosophical Transactions of the Royal Society A*, 368, 5151–5172.

¹⁰⁷ Nezar Hammouri, Jan Adamowski, Muwaffaq Freiwan, Shiv Prasher (2016) Climate change impacts on surface water resources in arid and semi-arid regions: a case study in northern Jordan, *Acta Geod Geophys* DOI 10.1007/s40328-016-0163-7. Online first: 19 Feb 2016. (<https://eis.hu.edu.jo/deanshipfiles/pub10367100124.pdf>)

¹⁰⁸ Nezar Hammouri (2009), International Conference and Exhibition on Green Energy & Sustainability for Arid Regions & Mediterranean Countries, Le Royal Hotel Amman, Jordan November, 10-12 2009 <https://www.weap21.org/Downloads/ClimateChangeImpactsJordan.pdf>

¹⁰⁹ Second National Communication (SNC) to UNFCCC (2009). UNDP and Jordan Ministry of Environment.

Drought events were likely predicted as indicated by the two indices of consecutive dry days and SPI. The maximum number of consecutive dry days would likely increase in the reference model of more than 30 days for the 2070-2100. Potential evaporation would also likely increase.

Based on the outcomes of the climate scenario modeling and vulnerability assessment conducted for the TNC, climate exposure, risks, sensitivity, impacts were assessed and adaptive measures were introduced.

For the Water Sector in particular, results revealed that based on the climate trends analysis using CORDEX and RCP 4.5 and 8.5 the main climate hazards that the water sector faces in Jordan are temperature increases, increased incidents of drought, increased evaporation, and precipitation decreases. Climate sensitivity indicators in water sector were determined as reduced groundwater recharge, groundwater quality deterioration, stream flow reduction and increased water demand.

Assessment of sensitivity showed that the average sensitivity level is 3.71. Adaptation strategies and measures suggested for the water sector in the TNC are:

- Rainwater harvesting
- Wastewater treatment
- Desalination
- Increasing Efficiency of irrigation technologies
- Grey water Reuse
- Public awareness

It is obvious that 5 out of the 7 adaptation measures advanced to water sector in Jordan are covered in this proposal.

(2) WADE EL AL. (2010) CLIMATE SCENARIO MODELING AND VULNERABILITY ASSESSMENT

This study was concerned with the quantification of the likely effect of anthropogenic climate change on the water resources of Jordan (one case study from the Northern part and one from the Southwestern part) by the end of the twenty-first century (2100). The study has two parts. In the first part, the effects of daily and seasonal precipitation patterns on streamflow in the upper River Jordan are explored using climate scenarios as inputs to the modelling framework. In the second part, the same methodology is applied to a site in southwestern Jordan, the Wadi Faynan, which is considered representative of the wadis draining to the lower Jordan, although the Wadi Faynan itself drains to the Dead Sea in the south rather than the Jordan River. Considered together, these two components provide insight into the mechanisms by which the projected changes in precipitation and near-surface air temperature will affect the hydrological cycle in semi-arid environments.

Specifically, a suite of hydrological models were used in conjunction with modelled outcomes from a regional climate model, HadRM3, and a weather generator to determine how future flows in the upper River Jordan, which forms the northwestern boundary of the Yarmouk Water basin where the two intervention sites of this proposal (Irbid and Mafrq) are located. Climate projections were extracted from HadRM3 RCM simulations of the 1961–1990 control and the 2071–2100 future periods. The hydrological components of the model framework are the Pitman rainfall–run-off model and the Integrated Catchments model (INCA v. 1.11.10). The Pitman model is a conceptual, process-based model of the rainfall–run-off relationship.

The results indicate that groundwater will play an important role in the water security of the country as irrigation demands increase. Given future projections of reduced winter rainfall under the A2 scenario for the 2071–2100 period, which is predicted to be for the upper Jordan for the largest monthly reductions around 30% during December and January and increased near-surface air temperatures, the already low groundwater recharge will decrease further. Simulations of the said study projected no increase in flood magnitude in the upper River Jordan. The reduction in winter rainfall can be related to changes in the largescale circulation and is predicted by most climate models (e.g. Kitch et al. 2008; Evans 2009; Hemming et al. 2010; Jin et al. 2010), the same cannot be said for the spring precipitation, which leads to large uncertainties in the prediction of rain in this season (Black et al. in press). At the peak of the rainy season, the number of rainy days is projected to decrease, reflecting reductions in both the PRR and the PDR, of approx. 25 per cent (PRR reduced from approx. 0.6 to 0.4–0.5 and PDR reduced from approximately 0.2 to 0.15). The overall picture is, therefore, of a longer rainy season with a less

pronounced peak, with the mean annual rainfall decreasing in the headwaters of the River Jordan and the Wadi Faynan. The reduction in rainfall is accompanied by an increase in mean annual temperature by 2°C and hence potential evaporation increases.

As a result of the reduced winter rainfall, and this indicates that flood magnitudes will be reduced. Increases in the flow extremes, in terms of flood magnitude and occurrence, are not evident, which is consistent with Black (2009), who found no significant changes in rainfall intensity in these projections for this region. Discussions in the said paper presents results of other interesting modeling studies and focuses on the implications of reduced water availability in Jordan. For example, the said paper highlights that the reduction in the mean annual rainfall and the increase in near-surface air temperatures suggest that irrigation requirements will increase, worsening the water shortage in the region. This suggestion is supported by preliminary applications of the CROPWAT model in the Water, Life and Civilisation study and by applications of a soil–vegetation–atmosphere transfer (SVAT) model TRAIN, which indicate increases in evapotranspiration and water demand (Menzel et al. 2009). The preliminary predictions of the CROPWAT model suggest that, at Ramtha in northwest Jordan, the irrigation demand will increase from 62 to 132mm of water when growing vegetables under the A2 scenario for 2071–2100 using HadRM3 and an assumed irrigation efficiency of 70 per cent. The TRAIN model provides an overview of the Jordan Valley region, and the modelled outcomes suggest a 6 per cent increase in the water demand for agriculture over the entire region and up to a 50 per cent decrease in water availability in northwest Jordan (HadCM3, A1B scenario, 2021–2050 compared with 1961–1990 control period). An overall increase in local and regional irrigation demand has serious implications for Jordan since further stress will be put on the groundwater resource.

(3) HAMMOURI EL AL (2009 & 2016) CLIMATE SCENARIO MODELING AND VULNERABILITY ASSESSMENTS

The most relevant and recent study conducted for the northern part of Jordan per se, where the activities of this project are located, is the recent study conducted by a group of national and international (Canadian) researchers, meteorology and climate experts published in 2016¹¹⁰. In the said study, lead by the deeply involved in climate modeling in Jordan, Professor Nezar Hammouri from Hashemite University, the Soil and Water Assessment Tool (SWAT), a watershed scale model developed by the USDA Agricultural Research Service (ARS), was used to assess climate scenarios, vulnerability and potential impacts of climate change on water resources in the northern regions of Jordan, Yarmouk Basin under different future climate scenarios. Yarmouk Water Basin, which spans the northern part of Jordan and southern part of western Syria and emptying into the Jordan River (Figure A), is the major surface water basin in Jordan where Irbid and Mafraq regions are located-Figure A, and Jerash (or Jarash) is only few kilometers to the south laying in another water basin named Amman Zarqa Basin, Figure B, which was assessed in another study by the same researcher¹¹¹. In the said studies, Global Climate Models (GCMs) were used to assess the future impacts of climate change on water resources in the three study areas. To study potential impacts of climate change on hydrological system and water resources, two river basins have been selected in the territory of Jordan: the Amman- Zarqa River and the Yarmouk River Baasin. To simulate potential changes in runoff, the WEAP hydrological model has been applied with three selected global circulation models (GCM) which are HADGEM1, CSIROmk3 and ECHAM5OM scenarios. The Amman-Zarqa River Basin (AZRB) (Figure B) is the second main tributary to River Jordan after Yarmouk River, and thus one of the most significant basins in the country with respect to its economical, social and agricultural importance.

¹¹⁰ Nezar Hammouri, Jan Adamowski, Muwaffaq Freiwan, Shiv Prasher (2016) Climate change impacts on surface water resources in arid and semi-arid regions: a case study in northern Jordan, *Acta Geod Geophys* DOI 10.1007/s40328-016-0163-7. Online first: 19 Feb 2016.
(<https://eis.hu.edu.jo/deanshipfiles/pub10367100124.pdf>)

¹¹¹ Nezar Hammouri (2009), International Conference and Exhibition on Green Energy & Sustainability for Arid Regions & Mediterranean Countries, Le Royal Hotel Amman, Jordan November, 10-12 2009 <https://www.weap21.org/Downloads/ClimateChangeImpactsJordan.pdf>

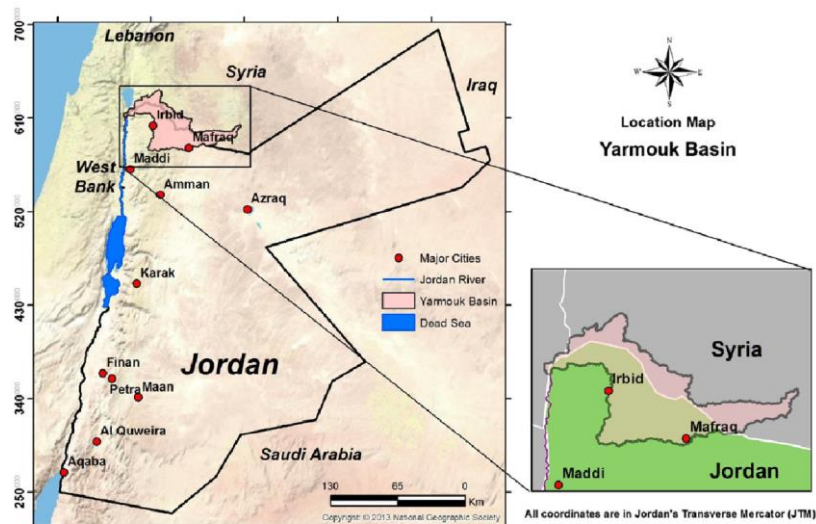


Figure A Geographical location of the Yarmouk River Basin within Jordan where the two (Irbid and Mafrqa) of the three sites of this project in Jordan are located.



Figure B Location map of Zarqa Basin (where Jerash intervention site is located) and Yarmouk Basin (where Irbid and Mafrqa intervention sites are located) catchment areas.

Yarmouk Basin has the semiarid climate of the Mediterranean Sea region with a limited amount of rainfall and high temperatures. The mean annual rainfall is about 410 mm, while mean annual temperatures is about 18 °C, respectively. About 60 % of the Yarmouk basin's agricultural lands are rainfed, and 20 % are irrigated. Due to over-pumping of groundwater and the construction of dams in Syria's portion of the basin,

the river witnessed a sharp drop in base flow in Jordan's northwest, during the late 1990s and early 2000s. Currently, the summer base flow of this river is about 158 MCM.

In the methodology followed by the above climate scenarios and vulnerability studies, climate, topography, soil and land use data were collected and downloaded to allow the calibration and validation of the GIS-assisted ArcSWAT model based on current conditions in the basin (i.e., baseline scenario). The three Global Climate Model (GCM) models best suited to the study area served to provide separate predicted climate data under different land management options for the ArcSWAT model. The validated SWAT model and using future climatic data provided an assessment of the impacts of climate change on water resources of the study areas. The adopted methodology to achieve the said study's objective is illustrated in Figure C.

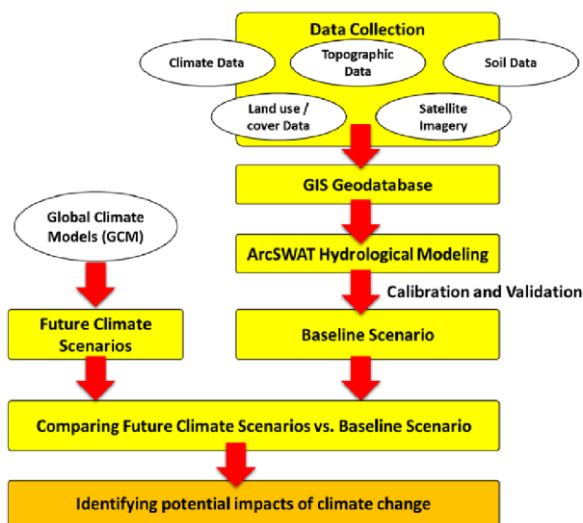


Figure C: Methodology adopted to assess the impacts of climate change in Jordan's Yarmouk River Basin.

Different sets of data were collected (which could be obtained from the researcher), which included:

- Digital Elevation Model (DEM) data
- Soil Data
- Landsat ETM ? Imagery data
- Meteorological Data
- Hydrological modeling using SWAT data (SWAT has been widely used to assess the impacts of climate change on water resources).
- General Circulation Models (GCM) Data for assessment of climate change impacts on water resources

In the said study, two types of future climate data were used:

- (1) Incremental scenarios (Figure D)
- (2) GCM scenario

Type of Scenario	Precipitation Change	Temperature Increase			
		+ 1°C	+ 2°C	+ 3°C	+ 4°C
Dry Years	-20%	S1	S2	S3	S4
	-10%	S5	S6	S7	S8
Normal Year	No Change	S9	S10	S11	S12
Wet Year	+10%	S13	S14	S15	S16
	+20%	S17	S18	S19	S20

Figure D Incremental scenarios utilized

Future climatic data were used to assess the impacts of climate change on water resources. Two types of future data were used in the said study. The first type of future data is incremental scenarios, where 20 different climatic scenarios were created to represent the dry, normal and wet year conditions. SWAT simulated results for the 20 incremental scenarios are shown in Figure E. The simulation results of these 20 scenarios showed that precipitation is the major factor that affects the vulnerability of surface runoff values. It was also determined that temperature plays a minor role in changes in surface runoff amounts.

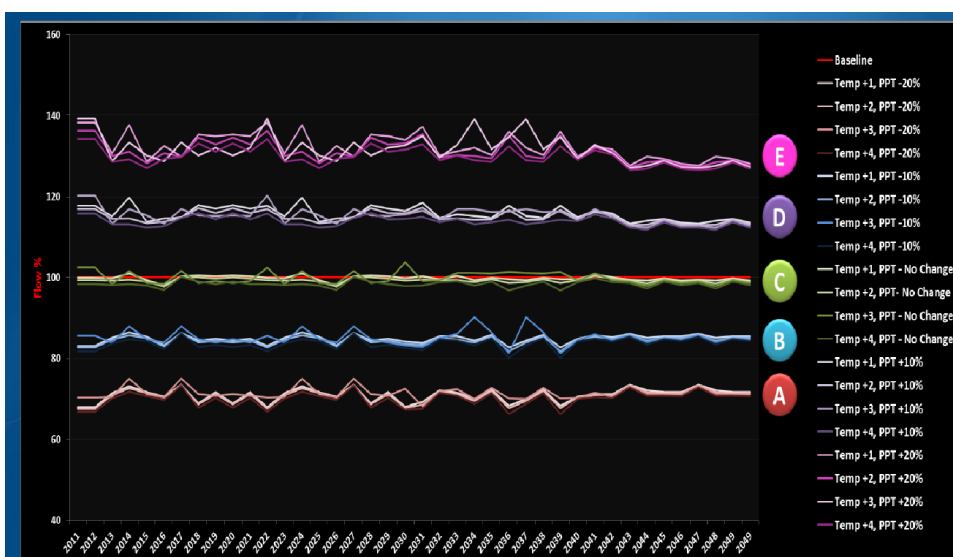


Figure E1 SWAT simulated results for the 20 incremental scenarios

The second type of future climate data used were the Global Climate Model (GCM) scenarios. To assess the impacts of climate change on water resources in the Yarmouk basin, GCMs were used to generate future climate data records. In the said study, temperature and precipitation outputs of 13 GCMs over the period of 1961–2005 were downloaded from the Canadian Climate Change Scenarios Network website (<http://www.cccsn.ec.gc.ca/>). According to Jordan's Second National Communication to the United Nations Framework Convention on Climate Change (MEJ-UNDP, 2009), there are three GCM models that best match Jordan's climatological records. These include the (i) CSIRO-Mk3 model developed by the Commonwealth Scientific and Industrial Research Organization (CSIRO), Australia, (ii) ECHAM5OM model, the 5th generation of the ECHAM general circulation model developed by the Max Planck Institute for Meteorology, Germany, and (iii) HADGEM1, the Hadley Center Global Climate Model, developed in the UK. For these three models SRES A2 climate models scenarios were used where regional economic development, high population growth and slow technological change are assumed (IPCC 2010). Future climate data from these models were downloaded on daily time scale to cover the period from 2010 to

2060. Daily precipitation, minimum and maximum temperature data from these three models were downscaled using a Statistical Downscaling Model (SDSM), a decision support tool developed to assess local climate change impacts, using a robust statistical downscaling technique (Wilby and Dawson 2004)¹¹².

Global Climate Models were used in the above-mentioned study to generate future climate records for the 70 year-period (2010–2080) for the Yarmouk basin study area. These data were used as inputs to the calibrated and validated SWAT model to assess the impacts of climate change on water resource of the study area. Each GCM scenario generated one set of stream flow predictions for the Yarmouk basin. Despite using three different GCM climate models, similar results were obtained.

Various magnitudes of decline in surface flow rates were expected in different months. The CSIROmk3 model predicts a major decrease in stream flow rates in February (about 41 %), 37 % in March, 18 % in December and 13 % in January. The net change for rainy months according to this model is 24 % decrease in stream flow rates. For the German model, ECHAM5OM, results similar to those of the CSIROmk3 model were obtained, except for October and November, where the model expect a decrease in stream flow rates with 10 %. The maximum drop is also expected in February (also roughly 40 %). For the entire rainy season, the net flow is projected to drop by 22 %. For the British model, HADGEM1, projected results are more catastrophic. For February, 50 % of the flow rates will decrease. For March, the three GCM models combined predict a drop in stream flow of 30 %. Across the three GCMs maximum drops in the surface flow rates are expected for February and March (45 and 35 % respectively). A minor (5 %) increase is expected in October and November. The three models projected that the net flow will drop by 22 % for the entire rainy season by the year 2080. This decrease will be particularly severe in the months of maximum peak flow (February and March), perhaps reaching as much as 35–40 %. Therefore, it is crucial to review Jordan's 2008–2022 National Water Strategy and take this into consideration when developing national and local (municipal) plans. Water for **irrigation**, in particular, represents 71 % of the water demand and 64 % of the water supply. According to Jordan's Water Strategy for the years 2008 to 2022 (MoWI 2009), the deficit in the available water resources was approximately 45 % in 2005, while the projected deficit in 2022 is expected to be around 30 %. This assumes that additional sources of water should be secured and exploited and some mega projects will be implemented. Such projects should include rainwater harvesting projects, greywater reuse projects and wastewater treatment for reuse projects. Furthermore, it is indispensable for Jordan to reconsider policies and strategies to assist the country adapt to the impacts of climate change and to reflect on these strategies and policies in the context of Jordan's National Water Strategy.

Based on these results, impacts of climate change are projected to raise **water deficits** in Jordan particularly in the northern part where the influx of refugee has worsen the situation. The considerable amount of data and information available from the climate modeling studies and vulnerability assessments described above will be thus the base for proposed municipality urban master plans at municipal level integrating climate and gender considerations to contribute to increasing resilience of such communities in line with SDG 5 and 13 and in coordination with other initiatives in the region such as the Enabling Communities for Climate Change Adaptation Planning :Understanding Gender Roles. Mainly Targeting SDG 5 and 13.

x

¹¹² Wilby RL, Dawson CW (2004) Using SDSM Version 3.1 – a decision support tool for the assessment of regional climate change impacts. User Manual. 67 pp. http://unfccc.int/resource/cd_roms/na1/v_and_a/Resource_materials/Climate/SDSM/SDSM.Manual.pdf. Viewed 16 Oct 2013

Lebanon climate change scenarios and vulnerabilities in project target area

Water Quantity Issue:

Human pressure on water resources has increased drastically since the 1970s, as confirmed by:

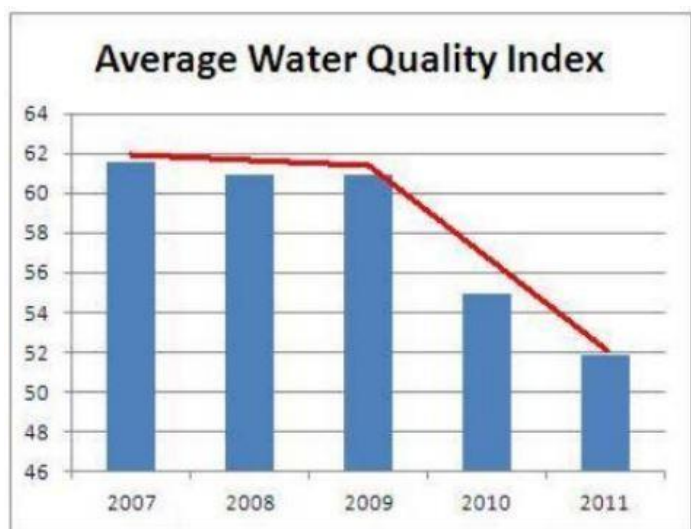
- Significant decrease in river flows, due to increased water withdrawals, through tapping of springs and direct pumping or diversion from the river for irrigation (personal purposes)
- Substantial groundwater depletion, due to extensive pumping both for domestic and irrigation needs.

As stated by National Council for Scientific Research (CNRS), the average annual discharge (mm³) in rivers and springs, namely the Litani river, from 1965 to 2015-17 (over 5 decades) decreased substantially, reaching up to 55%.

Water Quality Issue:

The quality of surface waters in the Litani River Basin varies seasonally and partially but is generally bad. Untreated wastewater discharges, both domestic and industrial, are one of the primary sources of pollution. According to the Litani River Authority (LRA), the average water quality index has been decreasing drastically since 2009.

Poor water quality is a serious public health issue. Water-borne diseases, worldwide, are one of the leading causes of mortality. The occurrence of Dysentery, Typhoid fever and Hepatitis A in the Bekaa is 7.5 annual cases per 10,000 residents, which is twice the national average (2009 statistics from the Ministry of Public Health). These are reported cases only, actual cases could be 5-10 times higher.¹¹³



Average Water Quality Index (LRA)

Analysis of the state of water-quality deterioration and land degradation in the Litani River Basin (LRB) showed that the main sources of contamination in the basin imply a chaotic urban expansion with resulting loss of arable lands and pressure on water resources in terms of both quantitative and qualitative aspects. Dumping of dAnalysis of the state of water-quality deterioration and land degradation in the Litani River Basin (LRB) showed that the main sources of contamination in the basin imply a chaotic urban expansion

¹¹³ Retrieved from Nassim Abou Hamad (Head of Water Governance Department at LRA): https://www.pseau.org/outils/ouvrages/office_national_du_litani_climate_change_effect_on_irrigation_2018.pdf (p.9–10, 14)

with resulting loss of arable lands and pressure on water resources in terms of both quantitative and qualitative aspects. Dumping of domestic sewage into streams caused significant bacteriological contamination. A dangerous disposal of liquid and solid waste, including industrial and municipal waste, was observed, which put an increasing pressure on the chemical contamination of surface waters. The LRB represents the most intensive agricultural areas of the country, and thus poor agricultural practices result in the excess use of chemicals and accumulation of nitrates and soluble pollutants in the soil–water ecosystem. domestic sewage into streams caused significant bacteriological contamination. A dangerous disposal of liquid and solid waste, including industrial and municipal waste, was observed, which put an increasing pressure on the chemical contamination of surface waters. The LRB represents the most intensive agricultural areas of the country, and thus poor agricultural practices result in the excess use of chemicals and accumulation of nitrates and soluble pollutants in the soil–water ecosystem.¹¹⁴

According to climate predictions from the PRECIS model, by 2040 temperatures will increase from around 1°C on the coast to 2°C in the mainland, and by 2090 they will be 3.5°C to 5°C higher. Rainfall is also projected to decrease by 10-20% by 2040 and by 25-45% by the year 2090, compared to the present. This combination of significantly less wet and substantially warmer conditions will result in an extended hot and dry climate. Temperature and precipitation extremes will also intensify. The drought periods, over the whole country, will become 9 days longer by 2040 and 18 days longer by 2090 (MoE, 2011).¹¹⁵

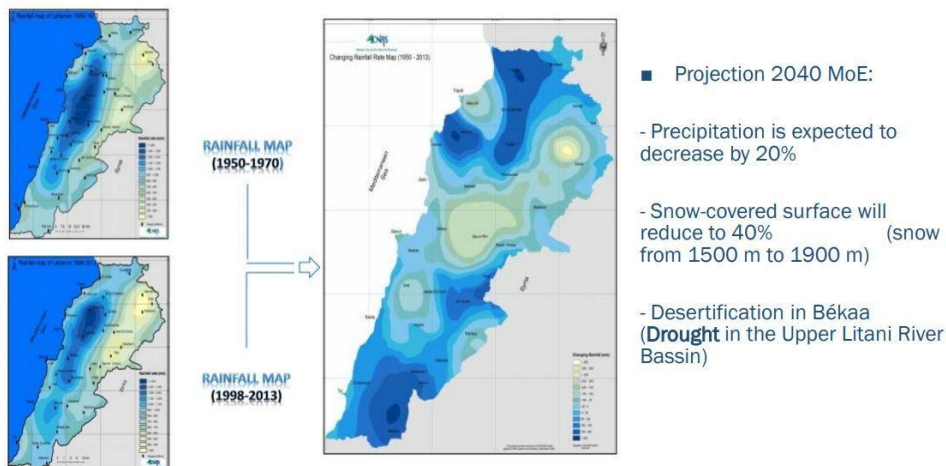
Table 3: Changes in temperature (Tmax, Tmin) and Precipitation (Prpc %) over Beirut, Zahle, Daher and Cedars from the PRECIS model for winter (DJF), spring (MAM), summer (JJA) and autumn (SON), 2025-2044

		Beirut	Zahle	Daher	Cedars
Prpc (%)	DJF	-7,95	-23,50	-0,99	-1,82
	MAM	-8,60	35,50	-0,38	-15,50
	JJA	-26,80	-84,20	-39,00	-49,80
	SON	-8,87	23,80	14,10	12,60
T _{max} (degrees C)	DJF	1,08	1,23	1,92	1,77
	MAM	0,87	1,14	1,53	1,28
	JJA	2,15	2,14	2,28	2,13
	SON	1,48	1,64	1,67	1,70
T _{min} (degrees C)	DJF	1,22	1,28	1,63	1,27
	MAM	0,90	1,09	1,36	1,06
	JJA	2,13	2,36	2,46	2,24
	SON	1,83	2,08	1,96	1,98

Obs. As changes from 2001-2010 averages
Source: MoE (2011)

¹¹⁴ Retrieved from (2018 publication): https://www.researchgate.net/publication/324265200_The_National_Plan_for_Litani_River_Remediation

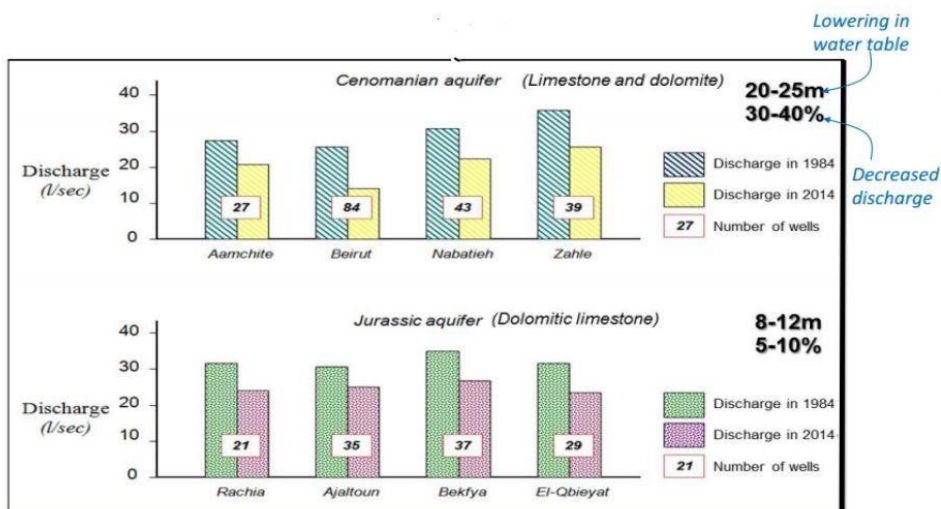
¹¹⁵ Retrieved from (2014 publication): https://www.aub.edu.lb/ifi/Documents/publications/working_papers/2013-2014/20140722_Higher_order_CC.pdf (p. 10)



Climate projections: Rainfall quantities (LRA)

Overall, there is a tendency for more rapid warming at higher elevations and with distance from the coast. Warming is most pronounced in spring at coastal sites and for summer at locations inland. The largest reductions to annual rainfall are found for sites in the coastal zone, and within the Bekaa Valley, where changes could be in the range 10–30 percent by the 2050s and 20–50 percent by the 2080s. The Bekaa Valley was estimated to consume 1.5 times the annual ground and surface water replenishment, leading to declining groundwater tables (Irrigation in the Near East Region, 1996).

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Groundwater depletion in the major aquifers; 245 boreholes (CNRS)

Approximately 8 percent of Lebanon's population—roughly 300,000 people—live under conditions of extreme poverty, meaning that they are unable to meet basic food and non-food needs (Laithy, Abu-Ismaïl, and Hamdan 2008). Poverty in Lebanon is mostly an urban phenomenon, with only 25 percent of people

living below the national poverty line being rural (International Fund for Agricultural Development 2003). Northern and southern Lebanon are the poorest regions, with the Bekaa Valley not far behind.¹¹⁶

Bekaa Climate Profile (WB 2011) ¹¹⁷	
Temperature Effects	The Bekaa region depends substantially on irrigation to grow crops, and the long dry summers commonly cause water shortages; The Bekaa Valley contains 46 percent of Lebanon’s cultivated land (FAO 2011); pressure on the land base has led to a decline nationally in wheat production in favor of high-value crops such as vegetables; ... Apple, cherry, peach, and grape crops in the Bekaa region have been harmed by the higher temperatures, decreasing their yields.
Precipitation Effects	In Lebanon, agriculture uses 60–70 percent of the country’s available water (Ministry of Environment (Lebanon) 2011); Lebanon is already experiencing substantial changes in water availability: Shaban (2009) estimates that rainfall and snow cover have decreased between 12 percent and 16 percent in the last 40 years, rivers and groundwater between 23 percent and 29 percent, springs by 43 percent, and local reservoirs by 79 percent;
Pests and Pathogen Management	There is limited monitoring of pests and relevant environmental conditions to inform pesticide applications, often resulting in applications at the maximum levels (Zeid 2007)
Effects of Livestock	Meat and milk from goats, sheep, and cows, are prevalent agricultural products in Lebanon, but are secondary to other forms of agricultural production (Asmar 2011). Goats and sheep are particularly concentrated in the Bekaa Valley. Effects of overgrazing and land fragmentation due to urban sprawl have decreased herd numbers. This decrease in grazing has subsequently led to increased biomass growth, and, with it, increased intensity and frequency of forest fires (Asmar 2011).

¹¹⁶ Retrieved from: <http://documents.worldbank.org/curated/en/115381468249300050/pdf/Middle-East-Increasing-resilience-to-climate-change-in-the-agricultural-sector-of-the-Middle-East-the-cases-of-Jordan-and-Lebanon.pdf> (p. 10, 55–60)

¹¹⁷ Ibid.

ANNEX 2: Project activities visualisation and target area maps

Figure 17: Needs and proposed concrete interventions in Zahle and surrounding municipalities

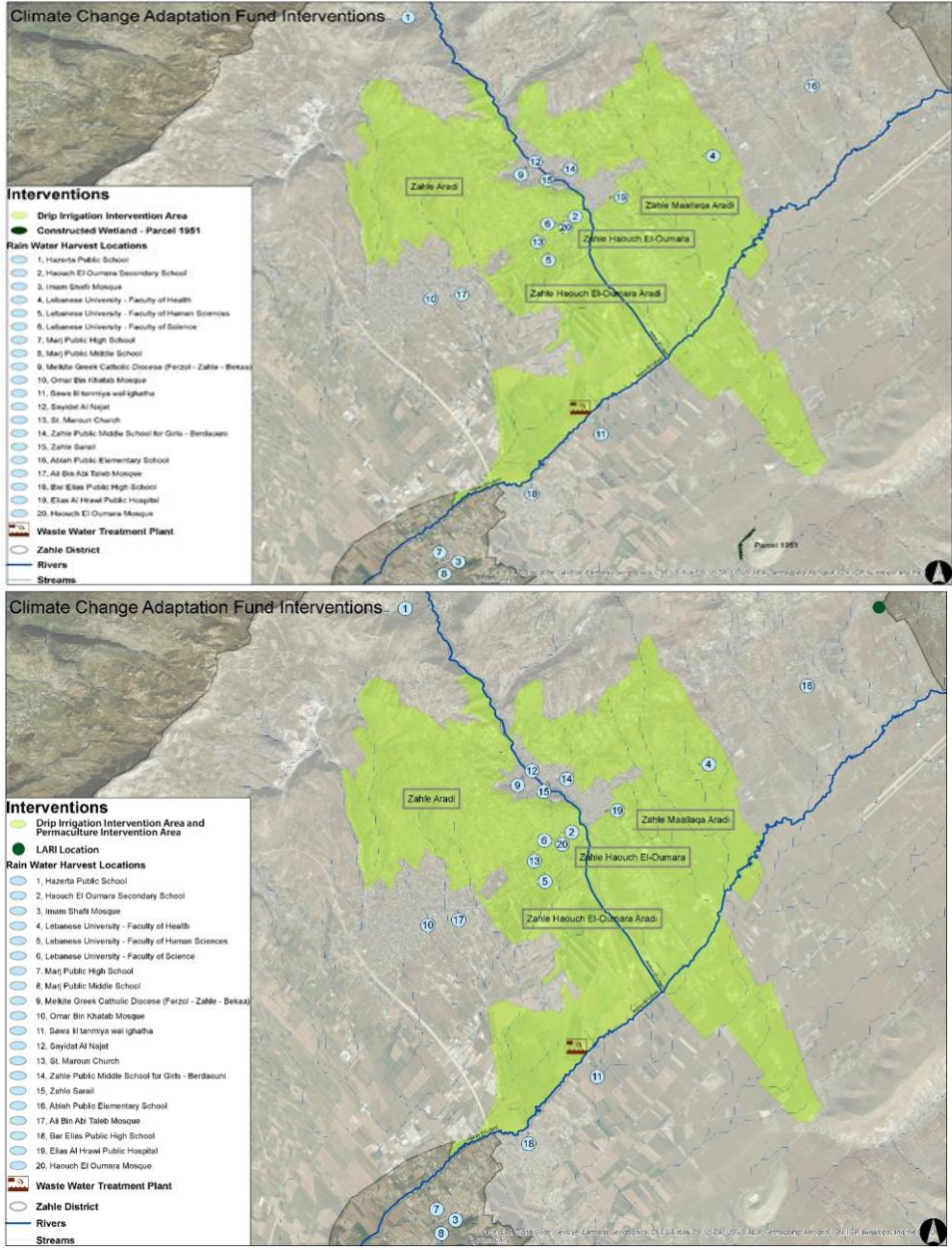


Figure 18: Schematic detail section of the Rainwater harvesting systems proposed for public buildings in the Bekaa area

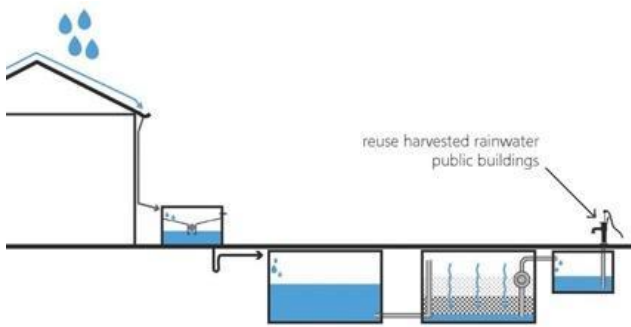


Figure 19: Map showing the reuse of the Zahle Wastewater Treatment Plant (ZWWTP) effluent for irrigation through the ~~install~~installment of a new open concrete irrigation canal



Figure 20: Schematic detail drawing of the proposed open concrete irrigation canal of the ZWWTP

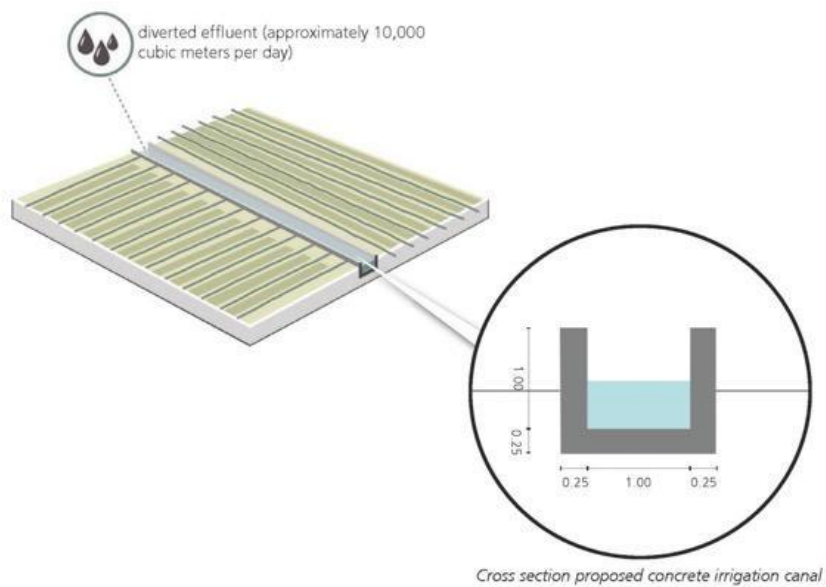


Figure 213: Water-efficient irrigation: schematic detail drawing introducing drip irrigation for potato plantations instead of the existing mini-sprinklers in Bar Elias

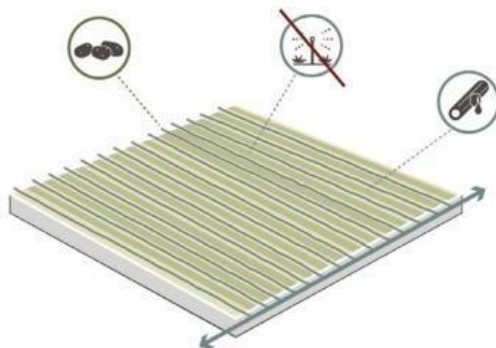


Figure 224: Water-efficient irrigation: schematic detail drawing introducing drip irrigation for fruit trees and vineyards instead of the existing surface irrigation in Zahle

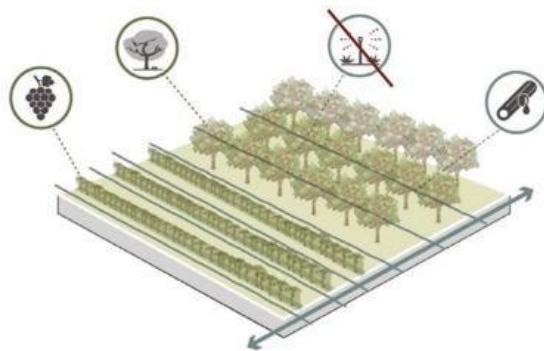


Figure 32: Permaculture demonstration site in Lebanon

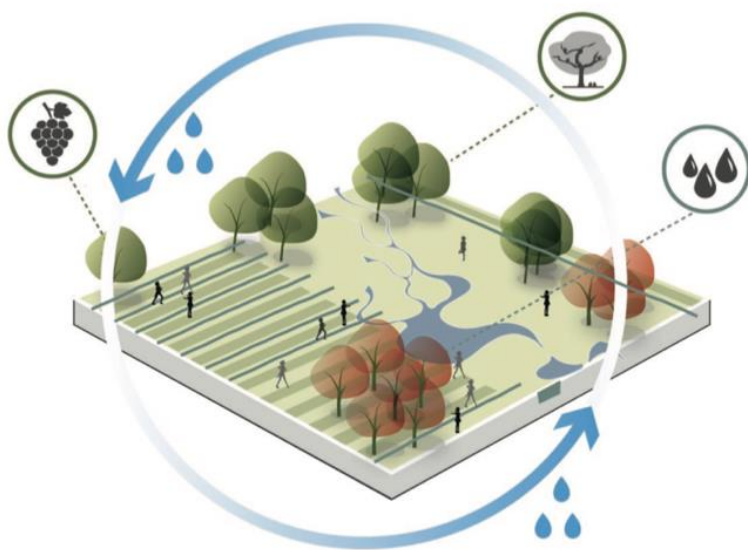


Figure 235: Proposed concrete interventions (component 3) in Jordan (Irbid, Mafraq and Jerash Governorates)

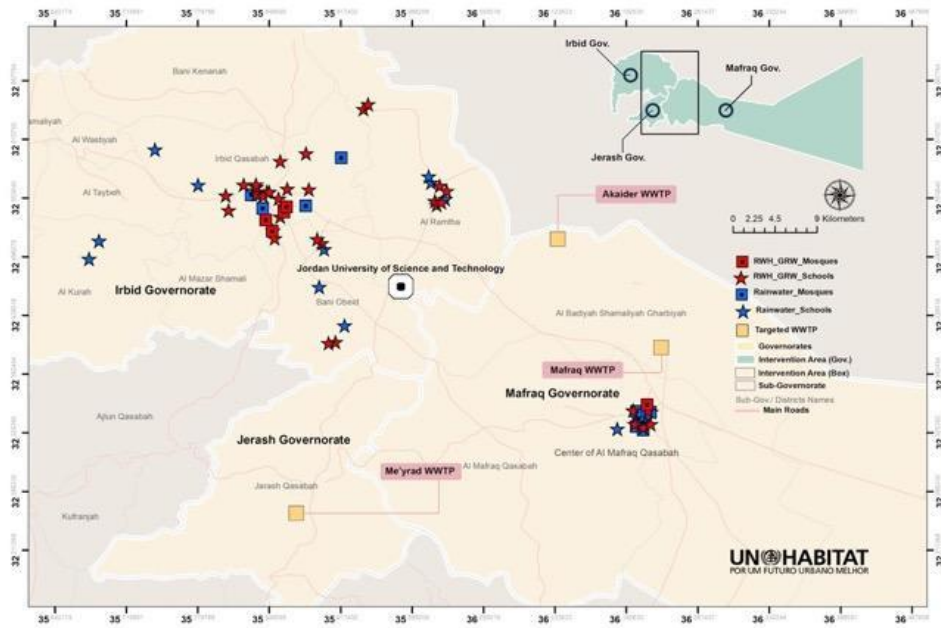


Figure 246: Proposed concrete interventions (component 3) (Irbid Zoom-in)

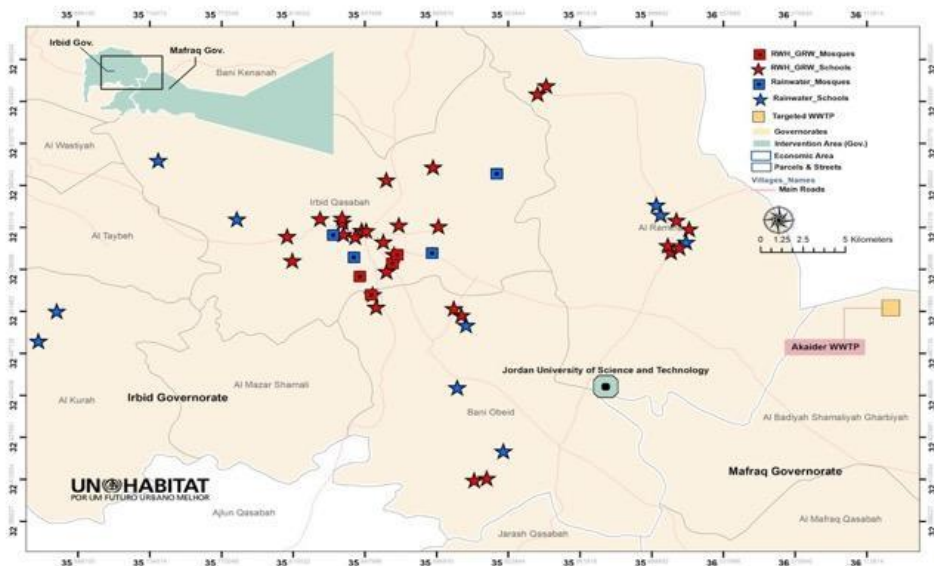


Figure 257: Proposed concrete interventions (component 3) (Mafrq Zoom-in)

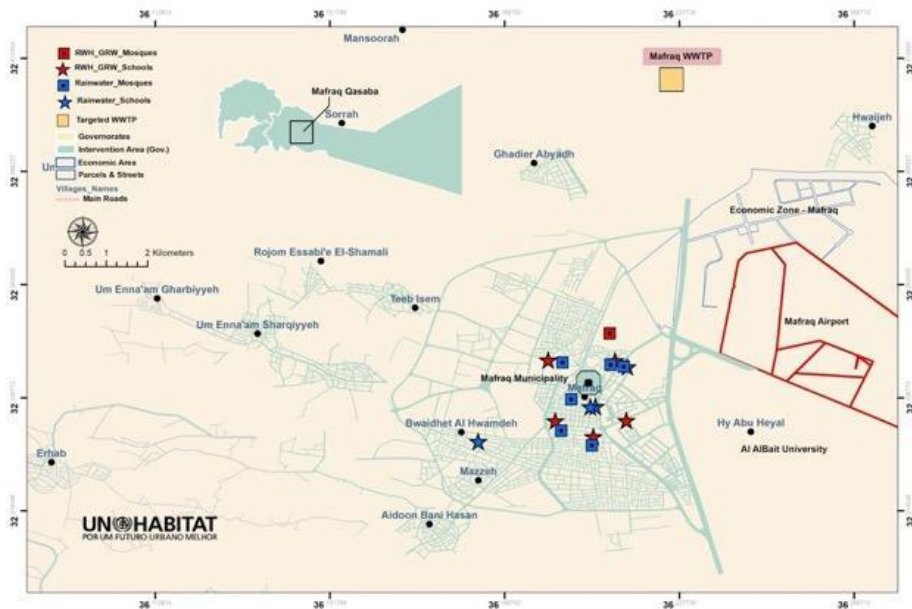


Figure 268: Schematic detailed drawing of rainwater harvesting systems proposed for schools/mosques/municipal buildings/residential buildings in Jordan

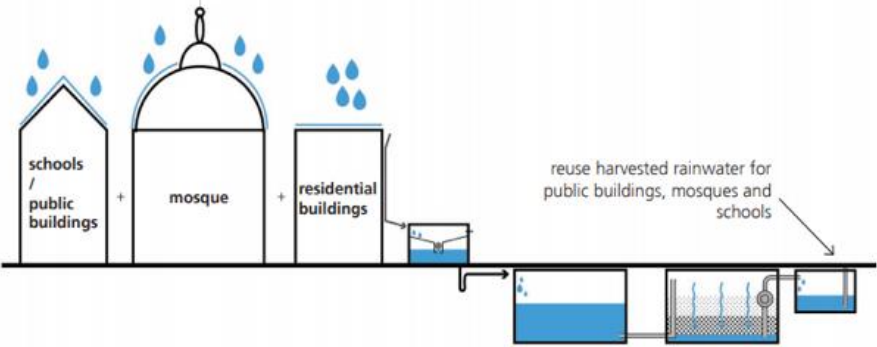
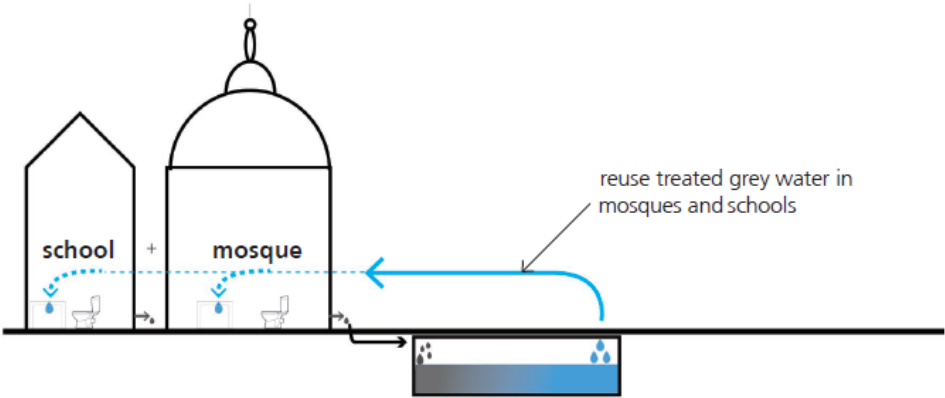


Figure 279: Greywater treatment and reuse: schematic detail section for greywater treatment and reuse system in schools and mosques



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Figure 2830: Location maps for three existing WWTP in Jordan to be upgraded



Waste water treatment plant Akaidr



Waste water treatment plant Maered



Waste water treatment plant Mafrq

Figure 2931: Water-efficient irrigation: schematic detail drawing introducing drip irrigation for farms in Mafrq and Jerash instead of the existing surface irrigation

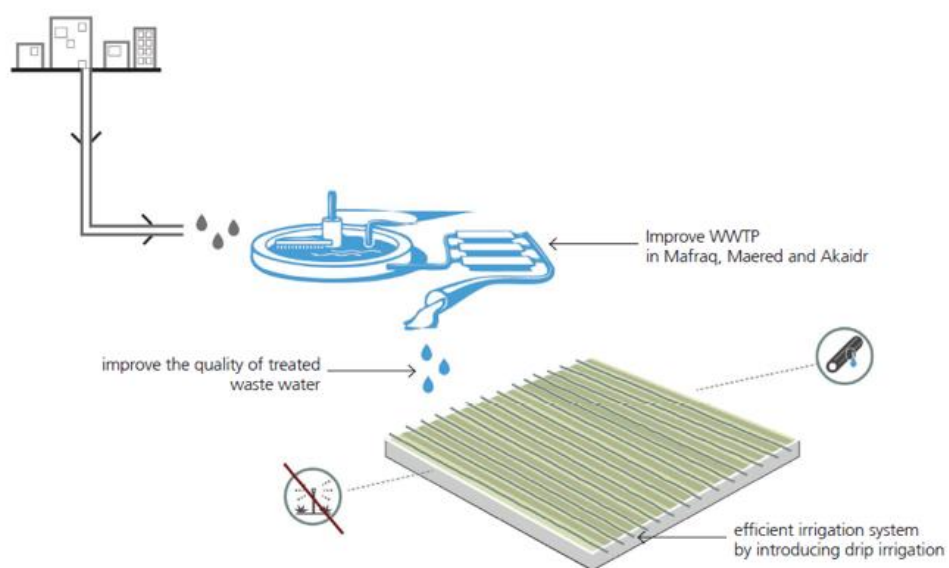


Figure 3032: Permaculture demonstration site

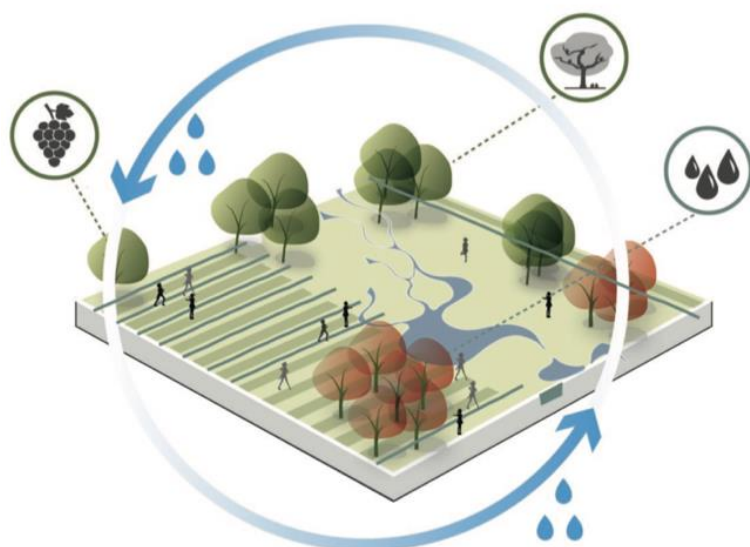
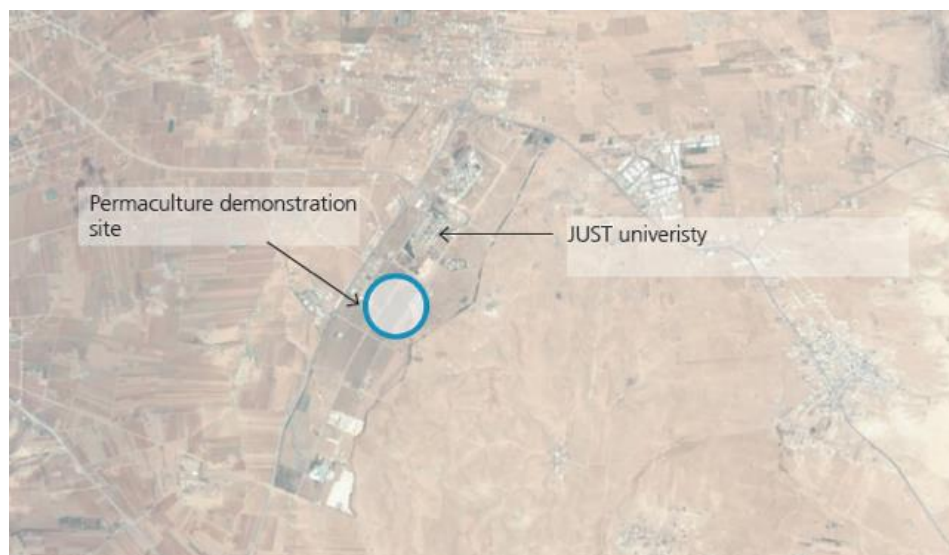


Figure 313: Permaculture demonstration site within JUST university campus in Ramtha, Irbid



ANNEX 3: Consultation outcomes, incl. for ESP and GP compliance





Table 32: Consultations conducted specifically to comply to AF ESP and GP





Environmental and social principles	Required to comply to AF ESP and GP	Consulted	AF ESP and GP compliance
<i>Compliance with the Law</i>	Identify relevant rules, regulations and standards, including procedures to comply to these for proposed interventions Identify national legal framework and guidelines for conducting EIAs for relevant projects	Ministry of Environment (Leb) Ministry of Energy and Water (MoEW - Leb) Litany River Authorities (LRA – Under the Lebanese MoEW Leb) Lebanese Agriculture Research Institute (LARI – Affiliated to the Lebanese Ministry of Agriculture (MoA)) Council for Development and Reconstruction (Leb) Ministry of Environment (Jord) Ministry of Water and Irrigation (Jord) The Ministry of Awqaf Islamic Affairs and Holy Places (Jord) Ministry of Education (Jord)	Relevant laws and how to comply have been identified (see section II.F)
<i>Access and Equity</i>	Identify needs and potential issues and concerns related to proposed project actions	Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted





<i>Marginalized and Vulnerable Groups</i>		UNHCR; Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted UNHCR has been consulted to understand specific needs and possible concerns of DPs
<i>Human Rights</i>		OHCHR; Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted UN-Habitat checked what core human rights have been ratified; OHCHR has been consulted to identify possible project human rights risks
<i>Gender Equity and Women's Empowerment</i>		UNICEF; UN Women; Beneficiary groups, including women, youth, Syrians and farmers	Detailed stakeholder mapping has been conducted Consultations with vulnerable groups have been conducted UN Women and UNICEF have been consulted to understand to understand specific needs and possible concerns of DPs. A gender baseline and approach has been developed based on a gender assessment
<i>Core Labour Rights</i>		ILO; Beneficiary groups, including women, youth, Syrians and farmers	Consultations with vulnerable groups have been conducted UN-Habitat checked what core Labour rights have been ratified; ILO has been consulted to identify possible risks of non-compliance to Core Labour Rights
<i>Indigenous Peoples</i>		Detailed stakeholder mapping has been conducted	Some Bedouins are now official Lebanese and Jordanians
<i>Involuntary Resettlement</i>		Municipalities; Beneficiary groups, including women, youth, Syrians and farmers	Resettlement will be avoided in all cases. All proposed activities are on public land or at building level where management / owners have agreed with the intervention
<i>Protection of Natural Habitats</i>	Identify any protected areas in target area	IUCN	UN-Habitat checked the IUCN Red list and consulted with IUCN regional office


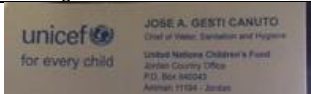



<i>Conservation of Biological Diversity</i>	Identify potential endangered species in target area	IUCN	
<i>Climate Change</i>	Identify potential emissions from proposed interventions	Risks screening and impact assessment studies, including public hearings / consultations with vulnerable groups	ESIA, ESP and consultation reports have been developed by accredited national consultants; these are in the process of being approved by the ministries of environment Energy use (for e.g. wastewater treatment systems) will be compensated with PV
<i>Pollution Prevention and Resource Efficiency</i>	Identify if considered interventions will use large quantity of energy		
<i>Public Health</i>	Include specific questions in vulnerable groups survey	Beneficiary groups, including women, youth, Syrians and farmers	All interventions will support clean water supply in accordance with international standards; health risks mitigation measures are taken
<i>Physical and Cultural Heritage</i>	Identify heritage sites Include specific questions in vulnerable groups survey	UNESCO website	No heritage sites have been identified in close to proposed project activities areas
<i>Lands and Soil Conservation</i>	Map any fragile and valuable lands in target area	IUCN; studies	Proposed interventions will support sustainable land/ soil use and avoid degradation




Table 33: Detailed overview of consultations conducted.




Stakeholder	Consultation objective	Outcome	Incorporation into project design	Evidence
Ministries				
<p>Samar Malek Acting Head of Service Environmental Technology</p> <p>Ministry of Environment (MoE) Lebanon</p>	<p>Align with government (ministry) priorities</p> <p>Avoid duplication with other projects (ministry projects)</p> <p>Confirm approach and focus is in line with priorities</p>	<p>MoE supports project on water focused in water harvesting and waste water reuse</p> <p>Zahle area is in high need but also complex environment</p> <p>If integrated water management approach / local adaptation plans are possible that would increase water use efficiency and better understanding and matching of demand and supply</p> <p>Lessons (for replication) from city level climate change adaptation options are very much needed in the region and this project could be an important contribution</p>	<p>Focus on water supply of most vulnerable through water harvesting and waste water reuse</p> <p>Explore feasibility and buy-in of local integrated water management approach / local adaptation plans to better match demand and supply while taking into consideration climate change projections and impacts (e.g. change in water availability from snow)</p>	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
<p>Randa Nemr Advisor to the minister</p> <p>Ministry of Energy and Water (MoE) Lebanon</p>	<p>Align with priorities and needs of the ministry</p> <p>Mapping of relevant projects and lessons learned</p> <p>Understand mandates</p>	<p>Main priority (National water master plan) is waste water reuse because far behind on targets</p> <p>Water harvesting is possible when fit</p> <p>Connection waste water reuse to agriculture would be efficient but would require a detailed irrigation study</p>	<p>Focus on water supply through water harvesting and waste water reuse in target area in line with National water master plan</p> <p>Identify options for connecting waste water reuse to agriculture</p>	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
<p>Youssef karam Irrigation, water, sewage & infrastructure department manager</p> <p>Council for development and reconstruction CDR Lebanon</p>	<p>Align with priorities and needs of the ministry</p> <p>Mapping of relevant projects and lessons learned</p> <p>Understand mandates</p>	<p>Priority of ministry of water is to construct dams to profit from water</p> <p>Projects with small check dams, to harvest and irrigate water, which is possible in Zahle area, is needed</p> <p>Water from Zahle waste water treatment plant can be used for agriculture irrigation; however, irrigation study is needed</p> <p>Studies required for project: impact of snow melt, impact of more rain in less time</p>	<p>Sub-projects with small check dams, to harvest and irrigate water in Zahle (also identified my mayor)</p> <p>Water from Zahle waste water treatment plant can be used for agriculture irrigation. Irrigation study is needed</p> <p>Studies within project: impact of snow melt, impact of more rain in less time</p>	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
<p>Dr Ahmad N. Abdel-Fattah General manager (AF project in Jordan)</p>	<p>Identify lessons learned from AF project</p> <p>Coordinate with MOPIC</p>	<p>Permaculture approach is promising as adaptation measure, also in urban context</p> <p>No national initiative for rooftop harvesting in Jordan while top priority in TNA – explore option for cooperation with water authority and municipality to set-up national programme with cost-sharing and possible tax measures to promote rooftop water harvesting</p> <p>Awareness raising required, e.g. at schools</p>	<p>Permaculture in urban context and in farms considered as option</p> <p>Explore options to set-up national initiative for rooftop rainwater harvesting, including on schools</p>	 <p>Date: 18-11-2018 + follow-ups Technique: discussion</p>




<p>Colin Gleichmann Head of Environment & climate portfolio</p> <p>Rahel Hermann Project manager</p> <p>GIZ (in Ministry of Environment Jordan)</p>	<p>Mapping of relevant projects and lessons learned Understand priorities in forthcoming NAP which is being developed by GIZ</p>	<p>Emerging issue and mentioned in forthcoming NAP are pressure of refugees on water services and floods</p>	<p>Refer to NAP in proposal</p>	 <p>Date: 18-11-2018 Technique: discussion</p>
<p>Ms. Dina Kisbi, Director of Climate Change Directorate</p> <p>Ms. Sarah Al Haleeq, head of Adaptation Section, And Mr. Bilal Shaqareen Ministry of Environment</p>	<p>Align with priorities and needs of the ministry Mapping of relevant projects and lessons learned Understand mandate and role</p>	<p>MoEnv is currently working on NAP with GIZ Water harvesting is a top priority in the TNA There is a lack of land use management plans that take into consideration climate change Building codes is not compatible with climate change</p>	<p>Refer to NAP in proposal Scale up rooftop rainwater harvesting Mainstream climate change adaptation into local spatial plans. Review building codes and incorporate rooftop rain water harvesting.</p>	 <p>Date: 24-10-2018 Technique: discussion</p>
<p>Eng. Mohammad Al Dwairi, Acting Secretary General Assistant for Strategic Planning, and and Mr. Adel Alobeiaat and Dr. Basim Hassan, Strategic Planning Specialist.</p> <p>Ministry of Water& Irrigation</p>	<p>Align with priorities and needs of the ministry Mapping of relevant projects and lessons learned Understand mandate and role</p>	<p>Priority of ministry of water is to focus on rainwater harvesting. Focus on water efficiency and invest in rainwater harvesting in remote areas and from rooftops. The Ministry is currently working on drought assessment.</p>	<p>Rooftop rainwater harvesting at household level and in farms considered as option. Identify options to incorporate water saving devices and raise public awareness.</p>	<p>Eng. Mohammad AL Dwairi, Acting Secretary General Assistant for strategic P Ministry of Water& Irrigation 07 7574 4046</p>  <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
<p>Ms. Dalal Eliwah Study and Design Manager- technical Affairs, Yarmouk Water Company</p>	<p>Align with priorities and needs of the Yarmouk Water Company Mapping of relevant projects and lessons learned Understand mandate and role</p>	<p>Complement the needs of YW projects current and future projects Contribute in reduction water demand of YW beneficiaries through providing additional water supplies resources</p>	<p>Increase rain water harvesting from rooftops Increase the use of Water Saving Devices to conserve precious water resources Enhance regular use of greywater treatment and reuse in public buildings to relief increasing demands on fresh water resources.</p>	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>

Eng. Lamia Sharif Al-Qawasmeh, Director of Planning and Development Department, previously Ministry of Municipal Affairs (MoMA), now, Ministry of Local Administration (MoLA)	Align with priorities and needs of the ministry Mapping of relevant MSSRP projects funded by the WB and lessons learned Understand mandate and role	Urban flooding is an issue in municipalities Coordinate to avoid possible duplications of activities, e.g. constructing box culverts in Mafraq Follow up on Innovation Fund outcomes in order to avoid \ complement and align the activities of the two projects (i.e. MSSRP and AF-Project)	Rehabilitation of exsiting water collection system such as existing ponds which colelcts runoff water from wadis and streets during winter time. Follow up on the relevant outcomes of the needs guide being prepared by the MSSRP.	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
Dr. Sami Alawiye Chairman/ General Manager of LRA (Lebanon)	Align with priorities and needs of LRA combatting pollution on the litany River Mapping of relevant projects and lessons learned, esp especially Joub Jannine Wetlands and its benefits to the surrounding ecosystem and agriculture Understand mandates	High discharge of waste water, industrial waste and other wastes into Litany River Farmers pumping sewage water to irrigate crops around the river High violations on the river banks River buffer zone 200m from its banks	Constructed Wetlands in Bar Elias on plots owned by LRA	 <p>Date: 05-12-2019</p>
Ihab Jomaa, PhD Head of the Department of Irrigation and Agrometeorology at the LARI (Lebanon)	Align with priorities and needs of the MoA Mapping of relevant projects, trainings for farmers, and lessons learned Understand mandates	Efficient irrigation techniques are often misused by farmers Involvement in crops testing and experiments and farmers training (LARI releases new varieties of wheat and barley after testing them to climate conditions on a yearly basis to the market) No national guidelines for wastewater reuse, using FAO 2010 instead. Farmers do not pay for irrigation water	Efficient irrigation techniques for potato crops Efficient irrigation techniques for fruit trees Capacity building for farmers cooperatives Confirm permaculture standards and application Other virtual meeting during COVID-19 lock down	 <p>Date: 05-12-2019</p>  <p>Date: 06-02-2020</p>
UN agencies (relevant projects, target area issues and needs and ESP and GP potential risks identification)				




<p>Olivier Thonet Chief of WASH</p> <p>UNICEF Lebanon</p>	<p>Mapping of relevant projects and lessons learned</p> <p>Understand needs and issues in target area</p> <p>Consultations for AF ESP and GP compliance (gender assessment)</p> <p>Discuss possible cooperation / coordination</p>	<p>UNICEF follows MoE (National water master plan) and municipal needs to increase connections of settlements to water resources, especially ground water wells</p> <p>UN-H can complement UNICEF work with focus on climate change adaptation in target area</p>	<p>Compliment UNICEF work in target area by focus on water harvesting and reuse and consideration of climate change</p>	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
<p>Jose A. Gesticanuto Chief of WASH</p> <p>UNICEF Jordan</p>		<p>UN-H can complement UNICEF work with focus on climate change adaptation in target area</p> <p>UNICEF possible executing partner</p>		 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
<p>Renata Raad WASH Officer</p> <p>UNHCR Lebanon</p>	<p>Mapping of relevant projects and lessons learned</p> <p>Understand needs and issues in target area</p> <p>Consultations for AF ESP and GP compliance (equally access, vulnerable groups and human rights approach)</p> <p>Discuss possible cooperation / coordination</p>	<p>Important to have a community approach to avoid social tension over water resources (equal access)</p> <p>UNHCR has specific focus on women headed households, children without care and disabled</p> <p>Water supply project require risk mitigation measures on waste and soil (to have access to water in environmentally friendly way) and water rights (since these are not clear)</p> <p>UN-H can complement UNHCR work with focus on climate change adaptation</p>	<p>Design project so it avoids risks related to social tension over water resources, pollution and environmental unfriendly use (waste and soil) and water rights</p> <p>Consider needs women headed households, children and disabled</p>	 <p>Date: 06-11-2018 Technique: discussion</p>
<p>Vincent Dupin Senior technical officer</p> <p>Roelof Wentzel WASH officer</p> <p>UNHCR Jordan</p>		<p>UNHCR has relevant refugee vulnerability profile related to livelihood and shelter</p> <p>Issue identified: municipality has challenges providing enough water in dry season</p> <p>Possible innovative technique: easy to dismantle and to be shipped to other location waste water treatment plant (in container)</p>	<p>Explore option of using possible innovative technique: easy to dismantle and to be shipped to other location waste water treatment plant (in container) – relevant for uncertain urbanization, e.g. with influx and departure refugees</p>	 <p>Date: 18-11-2018 Technique: discussion</p>
<p>Vahakn Kabakian AF focal point, also working for UNDP</p> <p>UNDP Lebanon</p>	<p>Mapping of relevant projects and lessons learned</p> <p>Understand needs and issues in target area</p>	<p>Focus on water supply of most vulnerable through water harvesting and waste water reuse</p>	<p>Focus on water supply of most vulnerable through water harvesting and waste water reuse</p>	

				Date: 09-11-2018 Technique: discussion
<p>Nedal M.Al-Ouran Head of env. CC and DRR portf</p> <p>UNDP Jordan</p>		<p>GCF proposal under review – other geographic focus but UNDP and UN-H will coordinate proposal development UNDP is piloting rainwater harvesting in public building Suggest to identify unused or not properly used already existing water harvesting systems and make better used of these</p>	<p>Include focus on identifying unused or not properly used already existing water harvesting systems (make better use of them) Conduct educational awareness programmes on climate related-water issues Promote non-conventional water options and focus on alternative water sources such as grey water. Contact and involve governance councils and boost their decentralisation role Benefit and disseminate indigenous knowledge on water harvesting.</p>	 <p>Date: 19-11-2018 Technique: discussion</p>
<p>Nasredin Hag Elamin Representative in Jordan</p> <p>Talal Al-Fayez Programme expert</p> <p>FAO Jordan</p>	<p>Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (lands and soil conservation)</p>	<p>FAO to share study on existing and potential water harvesting locations in Jordan FAO to share best practice on water harvesting options in Mafrag</p>	<p>A sub-sector strategy for water harvesting is needed to ensure the continued development of this alternative in a way that is effective and sustainable. Developing a sub-sector strategy on water harvesting and ensure equitable approach that benefits all groups. Diversify agricultural water supply and to improve agricultural water security. Water harvesting could be particularly useful in Mafrag Region for supporting the cultivation of fodder crops, given the existing importance of livestock in the area.</p>	 <p>Date: 19-11-2018 Technique: discussion</p>
<p>Sarah El jamal Programme officer Regional office for Arab States</p> <p>ILO Lebanon</p>	<p>Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (core labour rights)</p>	<p><u>Agriculture</u>: Lebanon and Jordan have both not ratified C129 - Labour Inspection (Agriculture) Convention, 1969 (No. 129) <u>Construction</u>: Lebanon and Jordan have both not ratified C167 - Safety and Health in Construction Convention, 1988 (No. 167) <u>Migrant workers</u>: Lebanon and Jordan have both not ratified C143 - Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143) <u>Women</u>: Lebanon and Jordan have both not ratified P089 - Protocol of 1990 to the Night Work (Women) Convention (Revised), 1948</p>	<p>Refer to core labour rights, technical conventions for safety and health and CBA in any contract Ensure safety and health measures are taken during project (especially for women and DPs) and are inspected during project Coordinate with ILO on skills needs and ILO projects</p>	 <p>Date: 16-11-2018 Technique: discussion</p>

Patrick Daru Country coordinator ILO Jordan		<p>Main potential issue / risk in Jordan: Convention 81 – labor inspection convention. Although ratified there is limited inspection capacity Increase in child labor (because refugees often work with whole family) Safety / harassment issues for women Figures: Not many women in construction, but many in agriculture Improvements and projects: Collective Bargaining Agreement (CBA) by 2019 Shawish (mediator) protect wage of Syrian refugees Flexible work permit for Syrian refugees (not dependent on one employer)</p>		 <p>Date: 19-11-2018 Technique: discussion</p>
Faten Tibi Programme Manager Women and Youth Empowerment Programme in Host communities UN Women Lebanon + Syria	<p>Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (gender assessment)</p>	<p>Many women (incl. Beduin) work in agriculture + food processing. Men work in agriculture, transport and markets Education of women is in general more modest than men Syrians only work in agriculture (allowed) In women empowerment project there are no issues between Syrian and Lebanese women Need to ensure secure / safe environment (i.e. protection) for women during work since gender-based violence can still be an issue in the region</p>	<p>Consider women roles in agriculture and water handling when designing the project Ensure women protection measures are in place for the project (when needed)</p>	 <p>Date: 08-11-2018 Technique: discussion</p>
Hazar Asfoura Programme Analyst, Women's Economic Empowerment Resilience and Empowerment Unit. UN Women Jordan		<p>Many women are working in agricultural sector in Jordan and thus affected by water scarcity. Due to water scarcity women who are engaged in agriculture sector are moving from one place to another following water availability Water scarcity is one of the reasons that prevent women from getting decent working opportunities in agricultural sector. Rural women's existing theoretical knowledge and understanding of climate change and adaptation remain limited, impeding their ability and willingness to act and find long term adaptive solutions. When asked about the services they would like better access to, only 25% of Women reported wanting better access to water compared to 37% of men. This is mainly influenced by gendered household roles.</p>	<p>Raising rural women's awareness on conservation techniques and climate change processes, proper greywater re-use and water harvesting techniques to strengthen climate-change adaptation processes. Strengthening rural women's leadership capacities so that they better engage in adaptive responses to climate change. fostering rural women's capacities to act and make significant achievements in adapting to climate change</p>	 <p>Date: 30-12-2018 Technique: Discussion</p>

<p>Mazan Shaqoura Deputy regional representative</p> <p>OHCHR Lebanon</p>	<p>Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (human rights)</p>	<p>Jordan and Lebanon have both not ratified core Human right¹¹⁸ W - INTERNATIONAL CONVENTION ON THE PROTECTION OF THE RIGHTS OF ALL MIGRANT WORKERS AND MEMBERS OF THEIR FAMILIES. THEREFORE, THE PROJECT NEEDS TO ENSURE DPS (AND LEBANESE) HAVE EQUAL ACCESS TO WORK OPTIONS AND ARE EQUALLY TREATED / REWARDED.</p>	<p>Include measures and clauses in contract to ensure on the left</p>	 <p>Date: 16-11-2018 Technique: discussion</p>
<p>Ali Hayajneh Water and CC programme</p> <p>IUCN regional (Lebanon and Jordan)</p>	<p>Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (natural habitats, biodiversity and soils)</p>	<p>IUCN is developing water security action plans at municipal level IUCN helped to identify potential (sub-project risks related to natural habitats, biodiversity and fragile soils in target areas Irbid and Mafraq are located within two eco-regions, there is one national designed protected area in Irbid (Yarmouk forest reserve) and there are some important bird areas Zahle district and surrounding municipalities are part of two eco-region. Zahle district includes 5 Hima areas; Kafer Zabad 20km², Anjar 20km², Kherbet kanfar 21.4km², Ainzebe5.5Km², Tarshish 10km², these area are important for the local communities as they provide a common practice of grazing and Agriculture production. There are also some important bird, mammal and flora areas close-by</p>	<p>The target areas are located in eco-regions with some vulnerable protected areas and animals. Proposed interventions are planned in urban areas and are expected to don't negatively interrupt these because of limited disruption of water flows (of seasonal streams) and land / soil interventions. However, during the full proposal, this will be studies and assessed in detail.</p>	 <p>Date: 19-11-2018 Technique: discussion</p>
<p>Sally Zgheib Water supply & sanitation specialist;</p> <p>Amal Talbi Senior Water Resources Management Specialist</p> <p>Shafick Hoossein Head of Environment and natural resources of Mashreq regions (Washington D.C)</p> <p>World Bank</p>	<p>Mapping of relevant projects and lessons learned Understand needs and issues in target area Discuss possible cooperation / coordination</p>	<p>Ensure to avoid social tension between groups and areas, also by understanding impact on interventions upstream and downstream – use intergrated water management approach Using treated waster water from Zahle plant is a good option to increase water use efficiency.</p>	<p>Avoid social tension and negative impacts of interventions through impact assessment (full proposal) Use intergrated water resource management approach if agreed by national government and local authorities</p>	 <p>Date: 08-11-2018 Technique: discussion</p>

¹¹⁸ <https://www.ohchr.org/EN/Countries/MENARegion/Pages/JOIndex.aspx>

Mirage for Waste Management & Environmental Services Zahle waste water treatment plant operator. Lebanon	Understand needs and issues in target area and how waste water can be used for agriculture	Waste water is currently being directed to Litani river but could be used for agriculture, especially in low(er) lying areas to avoid much pumping Feasibility waste water reuse for agriculture depends on crop and level of treatment	Design option for waster water reuse from Zahle waste water reuse plant for agriculture use and specific type of crops (fruit)	 <p>Date: multiple times since 2018 Technique: discussion and SC meetings</p>
Aya Housheimi WASH Coordinator – Zahle-Lebanon Norwegian Refugee Council Lebanon	Mapping of relevant projects and lessons learned Understand needs and issues in target area Consultations for AF ESP and GP compliance (human rights and ILO standards and approach for Syrian refugees)	The refugees rely on agricultural boreholes and shallow boreholes for household water supply. Due to drought those boreholes are getting drier, and more contaminated. Diseases, as a result of lessened personal hygiene, and household hygiene. Safety Protection Risks: Refugees, mainly women and children, travel long outside ITS looking for other water resources, which puts them in danger.	Rain water harvesting	 <p>Date: 07-12-2018</p>
Steering Committee Meetings Lebanon (MoE representative, MoEW representative, UNICEF, UN-Habitat and Consultant)	Align with priorities and needs of the ministries Mapping of relevant projects and lessons learned Understand mandates	Farmers not paying for the treated waste water usage Proper O&M of the Zahle WWTP Irrigation guidelines still not issued, currently being developed between MoEW and LIBNOR	Physical interventions cleared	 <p>Dates: 18-09-2019 07-10-2019</p>

ANNEX 4: ESP annex, incl. ESMP

Content:

- 1.1. Introduction, purpose, method, project overview / summary of project risks management approach
- 1.2. Risks screening and categorization
- 1.3. Environmental and social impact assessment (quantification)
- 1.4. Environmental and social management plan, including monitoring

1.1. Introduction, including summary description of the project/ programme

Introduction

Social and environmental policies are essential tools to prevent and / or mitigate undue harm of projects and project activities to people and their environment. In line with the Adaptation Fund's ESP and UN-Habitat's Environmental and Social Safeguard Policy (ESSP), UN-Habitat and partners are required to categorize the risk of the project as a whole and to manage potential risks and impacts.

Purpose

The purpose of this 'ESP annex' is to demonstrate (in an overview) how this project complies to the AF ESP. The annex shows what potential environmental and social risks and co-benefits and opportunities have been identified per project activity, the potential impacts of the risks and how these will be managed. This proposal and related country-specific ESIA-ESMP and consultation reports are being published on UN-habitat ROAS website: <https://unhabitat.org/af-lebanon-jordan>

Methodology

To ensure compliance with the AF ESP, all proposed project activities have been screened against the 15 AF principles (i.e. safeguards) to identify potential environmental and social risks and to assess related potential impacts. Where risks have been identified, impact assessments have been conducted and where needed, measures to avoid or mitigate risks and impact, identified (+ monitoring arrangements)

In both Jordan and Lebanon, risks screening sheets have been completed for each proposed project activity. Besides that, in both countries, accredited consultants prepared country-specific ESIA, ESMPs and consultations reports in compliance with the AF ESP and GP and national requirements for conducting ESIA. **Details in these reports, including risks mitigation measures, will be integrated in (sub)project execution plans, including for construction, operation and maintenance.** Below shows an overview / summary of these report (most important findings) and the outcomes have been consolidated in the proposal, including in the budget. The country specific ESIA, ESMPs and consultations reports are available through above website. The completed risks screening sheets for each project activity are available on request.

Data and analysis are provided based on collected disaggregated data focused on identification of climate change related needs, limitations, constraints and requirements specific for marginalized and vulnerable groups, especially of women and youth. Activity prioritization and the identification and verification of potential risks and impacts and, where needed, identification of measures to avoid or mitigate potential risks have been done with project beneficiary groups (through community surveys, focus groups discussions and community planning and decision-making processes during project preparation).

Overview / summary of project risks management approach

Table 34 overview / summary of project risks management approach.

ESP principle	Initial environmental or social risks present as per table in Part II.L Y/N	Impacts assessment	Safeguard measures	Monitoring indicator(s)	Baseline condition for each monitoring indicator
1 - Compliance with the law	No				
2 - Access and equity	No				
3 – Marginalized and vulnerable Groups	No				
4 – Human rights	No				
5 – Gender equality and women's empowerment	No				
6 – Core labour rights	No				
7 – Indigenous peoples	No				
8 – Involuntary resettlement	No				
9 – Protection of natural habitats	No				
10 – Conservation of biological diversity	No				
11 – Climate change	No				
12 – Pollution prevention and resource efficiency	Yes. Pollution. On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP	Spills, overflows and seepages are at plant level and can be contained there	Carry out regular inspections and routine tests to avoid spills, overflows, seepages and discharge of low-quality water (see also water quality testing below); include detailed risks mitigation measures identified in country-specific ESIA-ESMP reports in construction, operation and maintenance plans;	Monitoring of wastewater handling and possible spills, overflows and seepages. Construction and O & M report addressing above	Check standards for water quality, treatment and construction
13 – Public health	Yes. Safe water: water quality from RWH and GWTR systems may not comply to standards	Jordan: 86 RWH and 40 GWRT systems with following direct beneficiaries: 52,855 Lebanon: 20 RWH systems with following direct beneficiaries: 8,753	Rainwater collected will be treated using sand and carbon filter, a micro filter, and chlorine. This will ensure water quality compliance. Note that tap water is not used for drinking or cooking. Water and roofs will be regularly monitored, especially at the start of the rainy season; Filter will be changed annually, as per supplier recommendation. The chlorine tank should not be empty so there will be no pumping of air that impacts water quality; Students and building staff will be made aware (through	Water quality monitoring complying to standards; Awareness raising campaign; O & M (training) reports with attendance lists and photos; checking of filters and chlorine tank	Water quality check (compliance to tap water quality standards) Check filters and chlorine tank

			curriculum) of requirements of using water + involved in operation and maintenance; Remote monitoring systems will be installed		
	Yes. Safe water: treated waste water used for irrigation may not comply to quality standards / unmonitored irrigation water may reduce quality of crops; <u>also covid-19 may be detected in water entering the treatment facility</u>	Jordan: Extra from Maerad WWTP: storage tank with a capacity of 3,000m3 Extra from Al Kaider: Storage tank with a 2,000m3 Extra from Mafraq: 9,000 m3 Lebanon: From Zahle WWTP: 18,000 m3 From Wetlands: 6,000 m3	Although the project intervention aims to increase the quality of water for irrigation, regular testing of water quality, <u>incl for covid-19</u> is required and irrigation will only begin after testing; Farmers will be made aware of requirements for use + involved in operation and maintenance; For the wetlands, visual inspection of existence of mosquito breeding sites. In case of their presence, introduction of tilapia fish that feeds on the eggs.	Water quality monitoring of the effluent from the WWTP and wetlands . The level of treatment is tertiary. This needs to be checked on a regular basis. Checking mosquitoes	Water quality check (compliance with FAO guidelines for irrigation) Mosquito presence
14 – Physical and cultural heritage	No				
15 – Lands and soil conservation	No				

1.2. Screening and categorization

Based on the screening against the 15 AF principles, the project has been categorised as a “B” category project in terms of the environmental and social risks it poses. See Part II.L

According to the Jordan's EIA Regulations, particularly the EIA By-Law No. 37 of the Year (2005), the project has been categorized as “*Category III*” project, which imply that the proposed interventions in Jordan have no considerable risks or adverse impacts, thus not requiring full EIAs. This is due to the fact that all of the construction activities and installations of proposed sub-projects are not substantial and will be constructed or installed in already built and operating facilities, such as fully-functioning WWTPs, which at the time of original construction have been subjected to MoEnv's incumbent EIA regulations and supervision. However, although no impact assessments were required by national law, a full [ESIA and ESMP report](#) has been developed for the proposed project activities / outputs in Jordan, accompanied by a consultations report.

According to Lebanese decree 8633 MoE, 2012, Annex 1, the proposed project activities / outputs don't required full EIAs, ~~except the proposed constructed wetlands in Bar Elias, as this activity was categorised as 'category II' sub-project, which imply that an initial screening was required, followed by an EIA.~~ Similarly to Jordan, all of the construction activities and installations are not substantial and will be constructed or installed in already built and operating facilities, ~~except the proposed wetlands, which will be constructed on public land selected by the government for this purpose.~~ To comply to the AF requirements, risks screening and impact assessments have also been conducted for all proposed project activities.

For an overview of project activities' screening results against the 15 AF principles see table below. For details, see the next section.

Table 35: Overview of project activities' screening results against the 15 AF risk areas / principles. For more details see country-specific ESIA reports

Detailed outputs / activities	Risk screening result	Explanation why triggered or not
Component 1: Increasing the resilience of municipal governments: Manage urban risks and vulnerabilities in the context of climate change, esp. water scarcity challenges, and urban (population) growth, incl. from DPs migration		
Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon)	No risks identified	Activities involve assessment and planning processes. Potential risks considered are those related to unequal access and equity, also for vulnerable groups and gender, throughout the assessment and planning processes and identification of gender sensitive action plans. However, the execution entities involved will be required to involve beneficiary groups, including identified vulnerable groups (and women and youth) in the activities. Targets and quotas will be used. These will be verified during the project inception phase with execution entity specific baseline and targets and action plans, also to involve women and youth and other vulnerable groups.
Urban master plans at municipal level with climate change and gender mainstreamed (Lebanon)		
Urban master plans at municipal level with climate change and gender mainstreamed (Jordan)		
Component 2: Increasing the resilience of citizens (DPs and host communities): Improve awareness, ownership and capacities to respond to climate change, incl. to operate, maintain and replicate resilient water harvesting, supply and irrigation systems		
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rainwater Harvesting in Lebanon	No risks identified	Activities involve awareness raising and capacity building activities. Potential risks considered are those related to unequal access and equity, also for vulnerable groups and gender. However, the execution entities involved will be required to involve beneficiary groups, including identified vulnerable groups (and women and youth) in the activities. Targets and if needed, quotas will be used. These will be verified during the project inception phase with execution entity specific baseline and targets and action plans, also to involve women and youth and other vulnerable groups.
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rainwater Harvesting in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.3: Grey Water Treatment and Reuse in Jordan		
Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6: Water-use-efficient irrigation of treated wastewater for fruit trees in Lebanon		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use Efficient irrigation of treated wastewater from Maerad and Al Kaider WWTPs in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7: Water-use Efficient irrigation of treated wastewater from Mafrag WWTP in Jordan		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8: permaculture demonstration		
Community organization, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.9: permaculture demonstration		
Component 3: Increasing the adaptive capacity of the water sector: Expand unconventional water harvesting, supply and irrigation options, using innovative and replicable techniques suitable for the context		
Rooftop rainwater harvesting in Lebanon	Potential health risk (AF 13)	Safe water: water quality from RWH and GWTR systems may not comply to standards

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Rooftop rainwater harvesting in Jordan	(with some linkage to pollution prevention (AF 12))	
Greywater treatment and reuse in Jordan		
Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon	Potential health risk (AF 13) (with some linkage to pollution prevention (AF 12))	Safe water: water used for irrigation may not comply to quality standards / unmonitored irrigation water may reduce quality of crops, <u>Also covid-19 may be detected in water entering the treatment facility</u> Pollution: there is a small risk of contamination of soil, groundwater or surface water from on-plant accidental spills, overflows, seepages and discharges.
Efficient treatment and reuse of wastewater in Jordan (Maered WWTP)		
Efficient treatment and reuse of wastewater in Jordan (Al Akaider WWTP)		
Efficient treatment and reuse of wastewater in Jordan (Mafrq WWTP)		
Water-use-efficient irrigation of treated wastewater for fruit trees in Lebanon from Zahle WWTP, Lebanon	No risks identified	Activities mainly involve installing water efficient irrigation systems. The source of water will come from activities under outputs above, so potential risks related to safe water are handled under above outputs. Under comp 2, target communities will be organised and involved.
Water-use Efficient irrigation of treated wastewater from Mearad and Al kaider WWTP		
Water-use Efficient irrigation of treated wastewater from Mafrq WWTP, Jordad		
Permaculture demonstration – efficient water use system	No risks identified	Activities are very localised at JUST site <u>LARI presemises and other private farms premsies</u>
Component 4: Improving knowledge and policies and regulations to increase urban resilience in the region: Project KM and replication, incl. development of regional urban risks and vulnerabilities management model in the context of climate change and urban (population) growth (incl. from DPs migration)		
Regional / international KM with focus on sharing project lessons and replication	No risks identified	Activities include knowledge exchange though meetings, site visits, events, etc. UN-Habitat and UN-ESCWA will ensure equal involvement / representation.
Jordan and Lebanon KM with focus on project progress, best practices and lessons learned		
Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities	No risks identified	Activities include desk top consultancy work
Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities	No risks identified	Activities include desk top consultancy work

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Details and results of the risks screening process

*For more details see country-specific ESIA reports

Principle 1: Compliance with the Law.

Screening result: no potential risk

Explanation: During project preparation, all relevant rules, regulations and standards have been identified for all proposed project activities, including procedures / steps to comply to these. These are shown in Part II.F. Where required by national law, EIAs have been completed before the start of the project. Therefore, no potential risk of non-compliance exists.

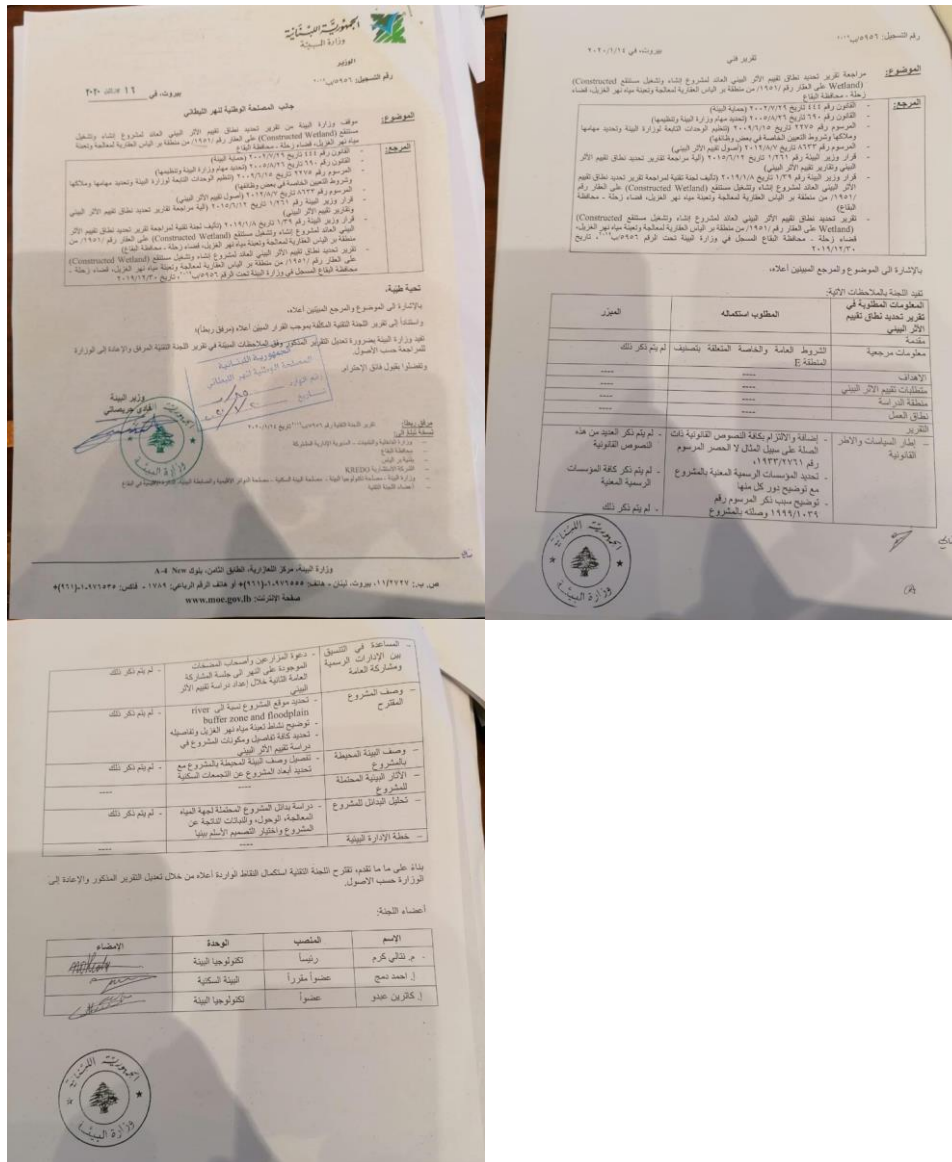
Below has been done for Jordan and Lebanon. Although no EIA was required by law in Jordan, an accredited consultant in Jordan conducting risks screening and impact assessments to comply to AF requirements. ~~In Lebanon, the proposed constructed wetlands in Bar Elias (output 3.4.2) was regarding as a category II sub-project. According to Lebanon decree 8633 MoE, 2012, Annex 1, a screening for the project was needed (see below).~~ Besides that an accredited consultant firm in Lebanon conducting risks screening and impact assessments to comply to AF requirements.

Table 36: Summary of the EIA Procedures in Jordan and Lebanon

Stage	Activity
Initial Filing and Screening	The Project Proponent completes a Project Information Form (PIF) of the intended project and submits it to the Ministry of Environment for screening. An Inter-ministerial Central Licensing Committee reviews the PIF, and after conducting site surveys determines if the project is classified as: Category I projects for which an EIA report is required Category II projects for which an initial EIA is only required Category III for which no environment analysis is required
Scoping	The Ministry issues legally binding guidance on the Scope of the Assessment Proponent prepares a ToR, after a mandatory public consultation. An Inter-Ministerial Technical Review Committee (TRC) reviews and approves the ToR. Accredited consulting entity commences with EIA.

Table 37: EIAs completed as required by national law

Output / activity	National EIA requirements and procedure	Outcome
3.4.1 Efficient treatment and reuse of wastewater through constructed wetlands in Bar Elias, in Lebanon <u>None</u>	According to Decree No. 8633,2012 of MoE, the following steps were taken: -A screening form for the project was submitted -MoE decision was that the project requires an EIA -A public consultation was held on December 18 th , 2019 -A scoping report was submitted to MoE on December 30 th , 2019. -The EIA report is the final step of the EIA process. It was submitted on January 13 th , 2020, following the reply of MoE on scoping report (see reply letter below) The EIA report should be approved within two months, is not relevant anymore because the wetlands are not part of the proposal anymore	Environmental Management and Monitoring Plan for the risks and impacts identified in EIA.



participatory process and through joint decision-making using water user and agriculture associations. Component 2 has been designed to facilitate this process, including awareness raising and capacity building of communities and vulnerable groups to operate, maintain and replicate proposed activities under component 3. Under component 1, various groups will be equally involved, in assessment and planning processes (if needed through quotas).

Principle 3: Marginalized and Vulnerable Groups.

Screening result: no potential risk

Explanation: all project beneficiaries (i.e. population; groups), including marginalised and vulnerable groups have been mapped for each project activity / output (see overview table 6). Desk research, expert consultations and community consultations and focus group discussions have been used (see Part II.1 and Annex 3) to identify possible risks / adverse impacts of project activities on marginalized and vulnerable beneficiary groups (i.e. specific needs, limitations, constraints and requirements of groups). Disaggregated data at the district and municipal and activity beneficiary level has been used to identify and quantify marginalized and vulnerable groups. Also, UNHCR has been consulted to to specifically identify potential risks and needs of marginalised and vulnerable groups.

Principle 4: Human Rights.

Screening result: no potential risk

Explanation: during project preparation and execution, international human rights are respected and where applicable, promoted. During project preparation, possible human rights issues have been identified by assessing whether Jordan and Lebanon are cited in any Human Rights Council Special Procedures, and to confirm and understand possible issues through consultations with 'experts.' Communities have also been consulted about possible human rights issues with the purpose of design activities appropriately.

OHCHR has been consulted and mentioned that both Jordan and Lebanon have both not ratified core Human right CMW - International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families. Therefore, the project needs to ensure DPs and Lebanese and all other groups have equal access to work options and are equally treated / rewarded. This will be done through participatory planning process and by included standard clauses in all contract with contractors ensuring all beneficiary groups will have equal access and opportunities. Moreover, awareness about this will be raised through poster, explaining rights and grievance options.

Principle 5: Gender Equality and Women's Empowerment.

Screening result: no potential risk

Explanation: the project ensures that gender equality and women's and youth empowerment is ensured for all project activities. During project preparation, this has been done through detailed stakeholder mapping (see also principle 3) including identification of specific needs, limitations, constraints and requirements of women and youth. UN Women and UNICEF have also been consulted to specifically identify potential risks and needs of women. A specific 'gender' approach and baseline section has been developed based on a gender assessment. See annex 5. In this section, the legal and regulatory context with respect to gender equality and women's empowerment in which the project takes place has been analysed, as well as cultural, traditional and religious context. Arrangements that ensure equal participation in project activities and consultations and equal access to benefits have also been identified in the gender assessment (approach and baseline).

Principle 6: Core Labour Rights.

Screening result: no potential risk

Explanation: the project ensures that all project activities meet the core labour rights and that possible risks have been identified and if existing, prevented or mitigated. During project preparation, this was done by identifying possible compliance issues by analysing if Jordan and Lebanon ratified the conventions, to confirm and understand these possible issues through consultations with ILO and by describing how the project will address possible compliance issues. Communities have also been consulted about possible labour issues that could arise while executing project activities with the purpose of design activities appropriately.

ILO identified the following:

- Agriculture: Lebanon and Jordan have both not ratified C129 - Labour Inspection (Agriculture) Convention, 1969 (No. 129)
- Construction: Lebanon and Jordan have both not ratified C167 - Safety and Health in Construction Convention, 1988 (No. 167)
- Migrant workers: Lebanon and Jordan have both not ratified C143 - Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143)
- Women: Lebanon and Jordan have both not ratified: P089 - Protocol of 1990 to the Night Work (Women) Convention (Revised), 1948

Potential issue / risks:

- Convention 81 – labour inspection convention. Although ratified there is limited inspection capacity
- Increase in child labour (because refugees often work with whole family)
- Safety / harassment issues for women

Figures:

- Not many women in construction, but many in agriculture
- Improvements and projects:
 - Collective Bargaining Agreement (CBA) by 2019
 - Shawish (mediator) protect wage of Syrian refugees
 - Flexible work permit for Syrian refugees (not dependent on one employer)

Therefore, UN-Habitat need to ensure all contracts include standard clauses to avoid any risks regarding above and that safety measures are taken and inspections conducted.

Principle 7: Indigenous Peoples.

Screening result: no potential risk

Explanation: the project ensures that project activities are consistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples by ensuring that possible issues are identified and mitigated / prevented. During project preparation, the project determined that no indigenous people are present in the project / programme target areas. This has been determined through stakeholder mapping (through desk research and expert and community consultations. Although Some Bedouins are now official Lebanese and Jordanians, no indigenous groups have been identified in target areas. Besides that, it has been analyzed if Jordan and Lebanon ratified the ILO Convention 169 and other applicable international instruments relating to indigenous peoples.

Principle 8: Involuntary Resettlement.

Screening result: no potential risk

Explanation: the project determined that no physical or economic displacement will take place due to the project/programme. This has been determined by mapping project target sites land ownership (private, public) and land use, also informally, and through consulting communities / users on the possible risk of resettlement and to get agreement on proposed interventions (i.e. no interventions will take place without the consent of inhabitants in the targeted areas). Land owners, private or public, have agreed with using their land for project activities. ~~As for the wetlands, the target land is public land (belonging to the Litani River Authority) and no land use, even informally takes place in the area. Agriculture was practices but stopped because of water challenges (legal papers are present in the feasibility studies / ESIA).~~ Regarding the construction of irrigation channels, these will also take place on public land and or in consent with the land owners, especially farmers, through the water use and agriculture associations. The other proposed project activities all take place in buildings or on the treatment plants premises. Public hearings and consultation in the target areas did not identify any concerns related to resettlement.

Principle 9: Protection of Natural Habitats.

Screening result: no potential risk

Explanation: the project ensures that no unjustified conversion or degradation of critical natural habitats will take place because of project activities. During project preparation, it has been checked if any critical natural habitats exist in the target location, including their location, characteristics and critical value (i.e. legal protection status, common knowledge or traditional knowledge), as well as possible negative impacts on these due to project activities. This has been done by checking IUCN Red list and by consulting IUCN (regional office)

Principle 10: Conservation of Biological Diversity.

Screening result: no potential risk

Explanation: the project ensures that any significant or unjustified reduction or loss of biological diversity because of project activities will be avoided. During project preparation, it has been checked if any important biodiversity exist in the target location, including their protection status and other recognised inventories as well as possible negative impacts on these due to project activities. According to the IUCN red list and UNESCO Man and the Biosphere Programme reserve, no sensitive biospheres are located in the target areas. This was confirmed through consultations with IUCN (regional office).

Principle 11: Climate Change.**Screening result: no potential risk**

Explanation: the project will ensure that project activities will not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.

Table 38: Identification of possible increase of greenhouse gases per project activity

Output / activity	Activity that may increase greenhouse gases	Possible increase in greenhouse gases
3.5. Efficient treatment and reuse of wastewater in Jordan	Energy use for some pumping	Although very limited, energy use could be increased because of pumping of water from WWTP to farm lands. To compensate for this, PV will be installed at the plants

Principle 12: Pollution Prevention and Resource Efficiency.**Screening result: there may be pollution risks due to treatment practices at WWTPs**

Explanation: the project aims to maximize energy efficiency and minimizing material resource and prevents waste and pollution due to project activities through analysis of possible risks of inefficiencies in energy and material resource use and waste and pollution risks of each activity – which has been done during project preparation. Irrigation of waste water from the Zahle WWTP for instance has been designed to serve farmers through a gravity system. However, these may be some risks of on-plant accidental spills, overflows, seepages and discharges of wastewater treated, which may contaminate soil, groundwater or surface water from WWTP.

Table 39: Identification of possible pollution risks per project activity

Output / activity	Possible pollution risks	Description possible health risks / impacts
3.4. Efficient treatment and reuse of wastewater, incl. through wetlands , in Lebanon	Pollution. Contamination of soil, groundwater or surface water	On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP
3.5. Efficient treatment and reuse of wastewater in Jordan		

Principle 13: Public Health.**Screening result: there may be potential health risks due to used water**

Explanation: the project will ensure that potentially significant negative impacts on public health are avoided. To avoid potential negative health impacts for project activities and other activities safety signs and equipment will be provided in line with core labour rights (155 and 187). Although the project intends to improve the quality already used for irrigation, water quality monitoring will take place. The same accounts for the rainwater harvesting and greywater treatment and reuse interventions.

Table 40: Identification of possible health risks per project activity

Output / activity	Possible health risks	Description possible health risks / impacts
3.1. Rooftop rainwater harvesting in Lebanon	Safe water	Water quality from RWH and GWTR systems may not comply to standards
3.2. Rooftop rainwater harvesting in Jordan		
3.3. Greywater treatment and reuse in Jordan		
3.4. Efficient treatment and reuse of wastewater, incl. through wetlands , in Lebanon		Treated waste water used for irrigation may not comply to quality standards / unmonitored

3.5. Efficient treatment and reuse of wastewater in Jordan	Improved water (safe water)	irrigation water may reduce quality of crops. <u>Also covid-19 may be detected in water entering the treatment facility</u>
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Principle 14: Physical and Cultural Heritage.

Screening result: no risk

Explanation: the project ensures that the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level due to project activities will be avoided. During project preparation, It has been checked if physical or cultural heritage sites are present or near project sites, as well as possible risks of impacts on these due to project activities. UNESCO listed Heritage sites in target area:¹¹⁹ Anjar has been identified as a heritage site in Lebanon (in the district of Zahle). However, this is not in the target areas.

Principle 15: Lands and Soil Conservation.

Screening result: no risks

Explanation: The project ensures no negative impacts lands and soil conservation will result from project activities. All proposed project activities aim to enhance sustainable land and soil use, especially for agriculture use. No major excavations will take place, ~~except for the initial phase of constructing the wetlands in Bar Elias, but this is to enhance vegetation. A study of the targeted area was done, showing that the target area has low organic matter content, which is one indicator of soil fragility. The proposed intervention will reduce the loss or degradation of the soil, reducing any related risk.~~

1.3. Environmental and social impact assessment

For an overview of project activities' potential risks and impact assessment result against the 15 AF principles, see table below.

Table 41: Overview of project activities' screening and assessment results against the 15 AF risk areas / principles

Output / activities	Potential risk / impact	Impact assessment
3.1. Rooftop rainwater harvesting in Lebanon	Safe water: Water quality from RWH and GWTR systems does not comply to standards	20 RWH systems with following direct beneficiaries: 8,753 (visitors, students)
3.2. Rooftop rainwater harvesting in Jordan		86 RWH systems with following direct beneficiaries: 52,855
3.3. Greywater treatment and reuse in Jordan		40 GWTR with following direct beneficiaries: 39,582 (same as under output 3.1.)
3.4. Efficient treatment and reuse of wastewater, incl. through wetlands , in Lebanon	Improved water (safe water): Water used for irrigation does not comply to quality standards / unmonitored irrigation water may reduce quality of crops. <u>Also covid-19 may be detected in water entering the treatment facility</u> Pollution. On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP	Output 3.4.1. The Zahle WWTP treats 18,000m3 and irrigate 110-116 hectares of farmland Output 3.4.2. The wetlands (60,000m2) treats 6,000m3 and will irrigate 40-70 hectares of farmland
3.5. Efficient treatment and reuse of wastewater in Jordan		Output 3.5.1. Maerad WWTP will store 3000m3 of water and irrigate 60 dunum of farmland Output 3.5.2. Al Kaider WWTP will store 2000m3 of water and irrigate 60 dunum of farmland Output 3.5.3. Mafraq WWTP will irrigate 100 dunum of farmland Spills, overflows and seepages are at plant level and can be contained there

Detailed country specific ESIA and ESMP for the proposed project activities in Jordan and Lebanon, ~~especially the constructed wetland~~ can be found on the [ROAS website](https://roas.org/)

1.4. Environmental and social management plan

¹¹⁹ <https://whc.unesco.org/en/list/?order=country#alphaG>

Content:

- ☐ Allocated roles and responsibilities environmental and social risk management / implement of the ESMP
- ☐ Opportunities for adaptive management
- ☐ Arrangements to supervise executing entities for implementation of ESMP
- ☐ Budget provision to manage environmental and social risks / implement of the ESMP
- ☐ Measures to avoid, minimize, or mitigate potential risks
- ☐ Risks monitoring system / indicators
- ☐ Grievance mechanism

Allocated roles and responsibilities for environmental and social risk management / implementation of the ESMP

The Regional Project Supervision Unit will be responsible for environmental and social risks management, including implementation of the Project ESMP. An AF and UN-H policies and reporting compliance expert will be part of the RPSU. This expert will also supervise Project Execution Entities on the implementation of the Project ESMP. Guidelines showing how to comply to the AF ESP and GP will be shared with all execution entities and they will be guided on process, including monitoring. Also, a detailed action plan to comply to ESP and GP will be developed during the project inception phase.

A Safeguarding system compliance expert will also be part of the RPSU. Monitoring staff part of the RPSU will require having expertise in social risk management and be familiar with the AF safeguarding system. The RPSU will be backstopped by UN-Habitat HQ, with experts on climate change, human rights, environmental and social risks managements and gender policies.

In both Lebanon and Jordan government stakeholders responsible for compliance to national environmental and social policies and standards will be part of the Regional- and National-level Steering Committees, as well as government gender focal points.

This ESMP will allow country-specific management of the potential risks and impacts identified under in country-specific ESIA and ESMP reports (see link at beginning of this document). It is worth noting that an MoU is needed with Litani River Authority (LRA) for the success of the [wastewaterwetland](#) activities (output 3.2.44.2). ~~LRA is offering the land, and will be responsible for the operation of the wetland. Based on public consultation, the municipality of Bar Elias is not capable of operating and maintaining the wetland due to lack of financial resources, as well as technical know-how.~~

All project-related ToR's and contracts will include clauses stating contractors will need to comply to the AF ESP, especially principle 1 (law), 4 (human rights), 5 (gender) and 6 and 13 (labour and safety) and the AF GP. This includes:

- ☐ Principle 1: References to standards and laws to which the activity will need to comply will be included in all legal agreements with all sub-contractors, including steps and responsibilities for compliance.
- ☐ Principle 4: References to relevant Humans rights declarations will be included in all legal agreements with all sub-contractors.
- ☐ Principle 5: Reference to relevant gender policies
- ☐ Principe 6: Employment and working conditions following ILO standards will be included in legal agreements with all sub-contractors.
- ☐ Principle 13: Ensure that ICSC international health and safety standards are clearly accessible and understood. e.g. by putting clearly visible signs detailing health and safety standards to be located at projects sites and by supplying protective equipment.

Opportunities for adaptive management

When changes in project activities or additional activities are required, these will need to go through a new risks screening and impact assessment process in compliance with AF, UN-habitat and national policies and standards. When this is required, this will be led by the RPSU and the Regional-level Project Steering Committee would need to approve the changes. As for opportunities, when allocated budgets for e.g. installing RWH systems allow targeted additional buildings for installing RWH systems, this would be possible following above process. Possible additional target buildings have already been identified.

Arrangements to supervise executing entities for implementation of ESMP

Table 42: Capacity of potential executing entities to carry-out gender responsive activities

Potential executing entity	Skills and expertise to provide gender mainstreaming inputs	Specific requirements execution entities for compliance	Capacity building needs
UNICEF (Lebanon and Jordan)	Yes (UN core value)	Appoint ESP a compliance and gender focal point Capacity to comply to the AF ESP and implementation of the ESMP guided by UN-Habitat Capacity to comply to the AF GP (see annex 5).	Awareness on requirements Share guidelines for execution entities to comply and to ensure 'opportunities' are identified and exploited
UN-ESCWA (Lebanon)	Yes (UN core value)		
Litany River Authorities (Lebanon)	Limited (as government entity)	Appoint ESP a compliance and gender focal point Capacity to comply to the AF ESP and implementation of the ESMP guided by UN-Habitat Capacity to comply to the AF GP (see annex 5).	Awareness on requirements Share guidelines for execution entities to comply and to ensure 'opportunities' are identified and exploited Support development baseline and approach before project start + reporting requirements
Bekaa Water Establishment (Lebanon)			
Lebanese Agriculture Research Institute (Lebanon)			
WAJ / Yarmouk (Jordan)			
BADIA FUND (Jordan)			
Companies / consultancy firms	Limited (as company)	Appoint ESP a compliance and gender focal point Capacity to comply to the AF ESP and implementation of the ESMP guided by UN-Habitat Capacity to comply to the AF GP (see annex 5).	
JOHUD (Jordan)	Some (as NGO / institute)		
Permaculture Research Institute (Jordan)			

Budget provision to manage environmental and social risks / implement of the ESMP

Dedicated safeguard compliance staff time is allocated under project execution fees for USD 42,000. Also, dedicated AF ESP and GP compliance staff time is allocated under MIE management fee for ROAS of USD 114,000. These persons will ensure compliance and develop ESP and GP compliance guidelines and action plans for execution entities and guide these execution entities through the process, including baselines and reporting requirements. Besides that measures are budgeted, through the execution entities, to supervise and monitoring proposed project activities, including e.g. water sampling, remote monitoring system of RWH and GWTR systems, etc. Costs for risks mitigation measures are integrated in the budget, including e.g. PV installation and water quality monitoring.

Measures to avoid, minimize, or mitigate potential risks

Table 43: Overview of project activities' screening and assessment results against the 15 AF risk areas / principles, including measures to avoid or mitigate risks / impacts

Project outputs / activities	Potential risk / impact	Impact assessment	Measures to avoid or mitigate risks / impacts	M & E arrangements	
				Indicator and method	Responsibility and frequency
3.1. Rooftop rainwater harvesting in Lebanon	Principle 13: Safe water: Water quality from RWH and GWTR systems does not comply to standards	20 RWH systems with following direct beneficiaries: 8,753 (visitors, students)	Rainwater collected will be treated using sand and carbon filter, a micro filter, and chlorine. This will ensure water quality compliance. Note that tap water is not used for drinking or cooking. Water and roofs will be regularly monitored, especially at the start of the rainy season; Filter will be changed annually, as per supplier recommendation. The chlorine tank should not be empty so there will be no pumping of air that impacts water quality; Students and building staff will be made aware (through curriculum) of requirements of using water + involved in operation and maintenance; Remote monitoring systems will be installed	Water quality monitoring; Awareness raising campaign; O & M (training) reports with attendance lists and photos; checking of filters and chlorine tank Water quality monitoring; Awareness raising campaign; O & M (training) reports with attendance lists and photos; checking of filters and chlorine tank; Remote monitoring systems will be installed	UN-H in cooperation with execution entities / government entities and building management Check (compliance to tap water quality standards) – at least every 3 months Check filters and chlorine tank - annually
3.2. Rooftop rainwater harvesting in Jordan		86 RWH systems with following direct beneficiaries: 52,855 (visitors, students)			
3.3. Greywater treatment and reuse in Jordan		40 GWRT with following direct beneficiaries: 39,582 (same as under output 3.1.)			
3.4. Efficient treatment and reuse of wastewater, incl. through wetlands, in Lebanon	Principle 13: Improved water (safe water): Water used for irrigation does not comply to quality standards / unmonitored irrigation water may reduce quality of crops, <u>also covid-19 may be detected in water entering the treatment facility</u>	Output 3.4.1. The Zahle WWTP treats 18,000m3 and irrigate 440-446 150 hectares of farmland Output 3.4.2. The wetlands (60,000m2) treats 6,000m3 and will irrigate 40-70 hectares of farmland	Although the project intervention aims to increase the quality of water for irrigation, regular testing of water quality is required, <u>also for covid-19</u> and irrigation will only begin after testing; Farmers will be made aware of requirements for use + involved in operation and maintenance; <u>For the wetlands, visual inspection of existence of mosquito breeding sites. In case of their presence, introduction of tilapia fish that feeds on the eggs.</u>	Water quality monitoring of the effluent from the WWTP and wetlands. The level of treatment is tertiary. This needs to be checked on a regular basis. <u>Checking mosquitoes</u>	UN-H in cooperation with execution entities / government entities Quality check (compliance with FAO guidelines for irrigation) – monthly Check standards for water quality, treatment and construction - monthly
3.5. Efficient treatment and reuse of wastewater in Jordan	Principle 12: Pollution. On-plant accidental spills, overflows, seepages and discharges of wastewater treatment may contaminate soil, groundwater or surface water from WWTP	Output 3.5.1. Maerad WWTP will store 3000 m3 of water and irrigate 60 dunum of farmland Output 3.5.2. Al Kaider WWTP will store 2000m3 of water and irrigate 60 dunum of farmland Output 3.5.3. Mafrag WWTP will irrigate 100 dunum of farmland Spills, overflows and seepages are at plant level and can be contained there	Carry out regular inspections and routine tests to avoid spills, overflows, seepages and discharge of low-quality water (see also water quality testing below); include detailed risks mitigation measures identified in country-specific ESIA-ESMP reports in construction, operation and maintenance plans;	Monitoring of wastewater handling and possible spills, overflows and seepages. Construction and O & M report addressing above	

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* For more details see country-specific ESIA reports

Risks monitoring system / indicators

The environmental and social risks management approach includes monitoring of potential risks and implementation of risks mitigation measures. This monitoring program commensurate with project activities and will report on the monitoring results to the Fund in the mid-term, annual, and terminal performance reports. Monitoring will be done to ensure that actions are taken in a timely manner and to determine if actions are appropriately mitigating the risk / impact or if they need to be modified in order to achieve the intended outcome. Annual reporting will include information about the status of implementation of this ESMP, including those measures required to avoid, minimize, or mitigate environmental and social risks. The reports shall also include, if necessary, a description of any corrective actions that are deemed necessary.

The Regional Project Supervision Unit will be responsible for environmental and social risks management, including monitoring of the implementation of the Project ESMP. An AF and UN-H policies and reporting compliance expert will be part of the RPSU. A Safeguarding system compliance expert will also be part of the RPSU. Monitoring staff part of the RPSU will require having expertise in social risk management and be familiar with the AF safeguarding system. Gender specific indicators and targets have been developed as shown in the results framework and annex 4. Specific budgets for risks monitoring are covered by M & E staff time under the execution fee (USD 63,000 total).

Table 44: monitoring arrangements for general risks management

Action	Indicator and method	Responsibility and frequency
Monitoring of capacity execution entities to comply	Guidelines and action plans shared Monitoring reports comply to requirements	RPSU; within half a year from inception RPSU; when reports are required
Implementation of grievance mechanism	Grievance mechanism information is at target locations (buildings, etc.) Grievance mechanism information is shown on UN-Habitat project website	RPSU in coordination with execution entities; within half a year from inception RPSU in coordination with execution entities; within half a year from inception
Monitoring of measures to avoid or mitigate risks / impacts per output	See table 42 above	RPSU in coordination with execution entities; when reports are required

Grievance mechanism

UN-Habitat in coordination with the execution entities will implement a grievance mechanism in the target areas, which will allow an accessible, transparent, fair and effective means of communicating if there are any concerns regarding project design and implementation. Project employees, and people benefitting / affected by the project will be made aware of the grievance mechanism for any criticism or complaint of an activity.

This mechanism considers the special needs of different groups as well as gender considerations and potential environmental and social risks, especially human rights (as shown on posters). A combination of mailboxes (at community / building level) and telephoning options offer an immediate way for employees and people affected by the project to safely express their concerns. The options will allow local languages and offer the opportunity for and people affected by the project to complain or provide suggestions on how to improve project design and implementation, which will be reviewed and taken up by the project implementation team.

Project staff and execution entities will be made aware of the procedures for receiving messages and on the reporting of any grievances. In addition, monitoring activities allow project participants to voice their opinions or complaints as they may see fit.

The address and e-mail address of the Adaptation Fund will also be made public (i.e. project website, Facebook and mailbox) for anyone to raise concerns regarding the project. For country-specific recommendations regarding the grievance mechanisms, see country specific ESIA-ESMPs.

ANNEX 5: Gender and youth assessment (approach and baseline)

Purpose

The purpose of this specific 'gender assessment' is to demonstrate (in an overview) how this project will comply to the AF GP. A gender approach and data baseline has been established, which is necessary at the project start against which implementation progress and results can be measured.

In line with UN-Habitat's ESSP, the approach includes the identification and of promotion of economic, social and environmental benefits and opportunities for women and youth for each project activity (which can be seen as an additional safeguard area).

During project preparation a 'gender assessment' has been conducted to identify potential project gender equality and women's and youth empowerment issues, but also opportunities. The outcomes are summarized below, as well as arrangements that will be taken during project implementation to comply to the AF GP, including to show how the project contributes to improving gender equality, the empowerment of women and youth and the project interventions' suitability to meet the adaptation needs of targeted women and men and youth.

Methodology

During the project preparation phase, potential gender equality and women's and youth empowerment challenges and opportunities have been identified through initial data analysis / desk research, surveys and focus group discussions with women, youth and other groups. Through these methods, specific women and youth needs and perceptions were identified, as well as potential gender-related risks and impacts, including possible concerns regarding proposed project activities.

Specific considerations and phases

1. Determinants for gender-responsive stakeholder consultations

Table 45: Stakeholders consulted to develop gender approach

Type of stakeholder	Specific stakeholder
National government	Lebanon: Ministry of Social Affairs (MoSa) – to be invited to the SC Jordan: Ministry of Social Development (MoSD) - to be invited to the SC
UN agencies	UN Women UNICEF
Community level	Community consultations and focus group discussions with women and youth

*See also part II.I

2. Initial Gender Assessment

- Data baseline – overview of disaggregated data (beneficiaries) in target areas.

Table 46: Data baseline – women and youth

Project outputs	Lebanon				Jordan			
	Direct		Indirect		Direct		Indirect	
	Women	Youth	Women	Youth	Women	Youth	Women	Youth
1.1.	192	72	217,475	23,733				
1.2.	96	36	84,815	9,256				
1.3.					180	67	415,44	259,107
2.1.	27,689	2,950	154,582	16,548				
2.2.					26,420	19,385	415,44	259,107
2.3.					21,940	15,646		
2.4.1	416	85	94,705	10,140				
2.4.2	600	300	35,514	3,802				
2.5					5	2	5,342	2,972
2.6.1	864	93	94,705	10,140				
2.6.2	320	34	35,514	3,802				
2.7.1					200	150	4528	2474

2.7.2.					180	120	814	498
2.8.					150	45	11,500	60
2.9	Insert 205	Insert 182	Insert 700	Insert 500				
3.1.	27,689	2,950	154,582	16,548				
3.2.					26,420	19,385	415,44	259,107
3.3.					21,940	15,646		
3.4.1.	2,013	216	94,705	10,140				
2.4.2	1,184	127	35,514	3,802				
2.5.1					31	20	3,789	1,980
2.5.2					31	20	739	494
2.5.3					35	20	814	498
3.6.1	2,293	540	: 130,219	13,941				
3.7.1					62	40	4,528	2,474
3.7.2					35	20	814	498
3.8.					150	45	11,500	60
3.9	Insert 205	Insert 182	Insert 700	Insert 500				
4.1.	80	30	Whole Mena region					
4.2.	80	30						
4.3.	80	30						
Total	80	30						

b. Context:

Table 47: analysis of gender-specific legal and cultural / religious context

	Jordan	Lebanon
Analysis of legal status of women	Jordan has seen important changes with regards to gender equality over the last decades. Work on women's rights reached new levels following the ratification of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 1992 and the establishment of the Jordanian National Commission for women (JNCW) in the same year. The indicators for women's education and health show notable improvements. However, women's participation in the formal labour market is low. Moreover, women are still not equal to men before the law. There have been several reforms of the Personal Status Law (the latest reform took place in 2010). Violence against women is not sufficiently addressed. The gender gap in politics persists despite introduced quotas for women. ¹²⁰	Article 8 of the Lebanese Constitution asserts the equality of rights and duties of all citizens, regardless of gender.[1] Lebanon ratified the Convention on the Elimination of All forms of Discrimination against Women (CEDAW) in 1997 with reservations to Article 9(2), regarding nationality; several subparagraphs of Article 16(1), related to personal status laws; and Article 29(1), on the settlement of disputes.[2] Lebanon has published CEDAW in the official Gazette, giving it primacy over national laws, one of the few Arab countries to do so. The country has not yet ratified the Optional Protocol. ¹²¹
Analysis of cultural/religious status of women	Country falls into group 5 countries: has low equality in HDI achievements between women and men: absolute deviation from gender parity greater than 10 percent (HDI 95 out of 189) and scores 'high' on level of discrimination of women on the OECD gender index (with access to resources, civil liberties, and son bias). ¹²²	Country falls into group 5 countries: has low equality in HDI achievements between women and men: absolute deviation from gender parity greater than 10 percent (HDI 80 out of 189) ¹²³ and scores 'high' on level of discrimination of women on the OECD gender index (with especially access to resources being an issue). ¹²⁴

c. Differentiated climate change impacts on men and women and their differentiated capacities do adopt to these, gender division of labour and gender-based power structures.

Table 48: Differentiated climate change impacts on men and women

Country	Sector / Livelihood	Climate change impact	Gender and youth equality and empowerment issues, incl.	Capacity to adapt and opportunities for promoting a
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¹²⁰ <https://www.genderindex.org/country/jordan/>

¹²¹ <https://www.genderindex.org/country/lebanon/>

¹²² <https://www.genderindex.org/country/jordan/>

¹²³ <http://hdr.undp.org/en/composite/GDI>

¹²⁴ <https://www.genderindex.org/country/lebanon/>

	relevant to the project		specific Vulnerabilities / barriers to adapt	'women' and 'youth' as agents of change
Lebanon	Agriculture	Drought / less work	High dependency on agriculture sector for income; cultural and traditional barriers to negotiate salary and work conditions	Women organization
	Water (domestic)	Drought / less work	Time consuming and involves safety risk (including harassment) to collect water and high financial burden to get water	Involve women and youth in water harvesting activities
Jordan	Agriculture	Drought / less work	High dependency on agriculture sector for income; cultural and traditional barriers to negotiate salary and work conditions	Women organization
	Water (domestic)	Drought / less work	Time consuming to collect water and high financial burden to get water. Physical and psychological stress to do house work (cleaning, laundry, etc.) once a week and mostly at night.	Collect water at home (through water harvesting)

d. Capacity gaps affecting GP compliance

Table 49: Capacity of potential executing entities to carry-out gender responsive activities.

Potential executing entity	Skills and expertise to provide gender mainstreaming inputs	Specific requirements execution entities for compliance	Capacity building needs
UNICEF (Lebanon and Jordan)	Yes (UN core value)	Appoint gender focal point Target women and youth for awareness and capacity building activities Identity specific women and youth needs in roll-out project activities Where realistic, use quota targets for women and youth participation in project activities Highlight specific gender and youth considerations in knowledge management Have a participatory (women and youth monitoring system)	Awareness on requirements Share guidelines for execution entities to comply
UN-ESCWA (Lebanon)	Yes (UN core value)		
Litany River Authorities (Lebanon)	Limited (as government entity)	Appoint gender focal point Target women and youth for awareness and capacity building activities Identity specific women and youth needs in roll-out project activities Where realistic, use quota targets for women and youth participation in project activities Have a participatory (women and youth monitoring system)	Awareness on requirements Share guidelines for execution entities to comply and to ensure 'opportunities' are identified and exploited Develop baseline and approach before project start + report
Bekaa Water Establishment (Lebanon)			
Lebanese Agriculture Research Institute (Lebanon)			
WAJ / Yarmouk (Jordan)			
BADIA FUND (Jordan)			
Companies / consultancy firms	Limited (as company)	Appoint gender focal point Target women and youth for awareness and capacity building activities Identity specific women and youth needs in roll-out project activities Where realistic, use quota targets for women and youth participation in project activities Highlight specific gender and youth considerations in knowledge management Have a participatory (women and youth monitoring system)	
JOHUD (Jordan)	Some (as NGO / institute)		
Permaculture Research Institute (Jordan)			

e. Opportunities for promoting a 'women' and 'youth' as agents of change

Through community-level consultations, it was found that women in Jordan and Lebanon (from both host communities and DPs) have knowledge regarding the water use and (urban) farming. The project aims to utilizing women's traditional knowledge by targeting women in community level skill building and trainings. Enhancing women and youth's capacities for efficient water harvesting and grey water treatment and re-use will help address their vulnerabilities to water scarcity. In Jordan, permaculture training would secure a source of livelihoods for women. Opportunities include:

- ☐ Have women, youth and Syrians participate in assessment and planning processes + monitoring
- ☐ Include women and youth considerations / roles in strategies and plans
- ☐ Target and strengthen women organizations
- ☐ Women to be involved with O & M RWH in buildings
- ☐ Youth to work with women on O & M RWH in buildings, esp. schools
- ☐ Women and Youth to be involved with GWTR in mosques and schools
- ☐ Women to be involved in permaculture activities as consultations have shown that they see it as a source of income and can develop business cases.
- ☐ Youth to be target and if possible, lead awareness raising campaigns on adaptation to water scarcity.

3. Project planning and design.

Table 50: Gender baseline, goals and activities. A detailed action plan will be developed at inception phase

Project outputs	Disaggregated beneficiaries, gender specific issues and needs / baseline	Key gender goals (to improve equality)	Entry points (to integrate gender considerations / empower women / youth)	Suitable interventions to meet specific needs and built on women and youth skills and knowledge	Additional activities needed to ensure gender perspective, incl. potential risk mitigation measures	Specific 'gender' output Indicator	Specific 'gender' targets	Budget required and allocated
1.1. 1.2. 1.3.	Limited participation women and youth and roles are not specified in plans	Women and youth to be involved in assessment and planning	Women and youth groups	Involve women and youth groups and have specific gender considerations in plans	Use quota if needed Check women and youth considerations in plans	% women and youth participation in assessment and planning Women and youth considerations in plans	Women: 40 % Youth: 15 % Specific mentioning	A dedicated safeguard compliance staff time is allocated under project execution fees for USD 42,000 Dedicated AF ESP and GP compliance staff time is allocated under MIE management fee for ROAS of USD 114,000 These persons will ensure compliance and develop ESP and GP compliance guidelines for execution entities (with support from UN-HQ)
2.1. 2.2. 2.3.	Women and youth should get a chance to be involved with RWH and GWTR activities	Involve women and youth in O & M and replication options; Youth to be involved in awareness	Women and / or youth focus point / lead in buildings		Follow-up on selected focal point	Focal point identified % youth participating in awareness campaigns	1 per building Youth: 30 %	
2.6. 2.7.	Farmers and workers, incl. Syrians and youth are targeted	Ensure Syrians and Lebanese are equally involved	Workers participate in water associations	Youth to be targeted for modern irrigation technique use capacity building	Use quota if needed	% Syrians and youth participation	Syrian: 15 % Youth: 30 %	
2.8.	Students are targeted of which most female	Females to participate in activities and curriculum	Female considerations in knowledge management	Female students to work with Syrian women	Follow-up on cooperation	% female students	Female: 60 %	
2.9	<u>Students are targeted of which most female</u>	<u>Females to participate in activities and curriculum</u>	<u>Female considerations in knowledge management</u>	<u>Female students to work with Syrian women</u>	<u>Follow-up on cooperation</u>	<u>% female students</u>	<u>Female: 51 %</u>	
3.1. 3.2. 3.3.	Women and youth need to be involved with RWH and GWTR	Involve women and youth in O & M of systems	Women and / or youth focus point / lead in buildings		Follow-up on selected focal point	Focal point identified	1 per building	
3.6. 3.7.	Farmers and workers, incl. Syrians and youth are targeted	Ensure Syrians and Lebanese are equally involved	Workers participate, if possible, in project works	Youth to be targeted for modern irrigation technique establishment	Use quota if needed	% Syrians and youth participation	Syrian: 15 % Youth: 30 %	
3.8.	Employees could be female	Select (partially) female workers	Selection process		Follow-up on selection process	% female employees	50 %	

3.9	Employees 50% of which are to be females	Select (partially) female workers	Selection process	Youth to be targeted for rain water harvesting and permaculture techniques establishment	Follow-up on selection process	% female employees	50 %	
4.1.	Limited involvement women	Women to participate in meetings	Quota / Steering committee	Have specific gender considerations in knowledge management	Use quota if needed	Women and youth considerations in KM	Specific mentioning	
4.2.								
4.3.	Women roles and youth are not specified in plans and knowledge management	Women and youth roles to be identified	Consider gender and youth issues and needs	Have specific gender considerations in knowledge management	Check women and youth considerations in plans	Women and youth considerations in plans / KM	Specific mentioning	

4. Project implementation

UN-Habitat aims to have a gender responsive and adaptable management approach in place which, when needed, allows adjustment based on learning from earlier decisions and interventions and received feedback. This is done through having gender expertise and focal points in place, whom should identify challenges, barriers or restrictions that arise during project/programme implementation, which might hinder the equal participation of men and women in activities.

Capacities of execution entities will be built so they are able to provide gender mainstreaming inputs and identify any challenges that arise during project/programme implementation, which might hinder the equal participation of men and women in activities. This requires appointing a gender focal point and having quota targets for women and youth participation in project activities. Gender focal points from the government will be part of the steering committees.

The project Grievance mechanism established will be capable to accept grievances and complaints specifically related to gender equality and women's empowerment

5. Performance Monitoring and Evaluation

The gender responsive management approach includes gender responsive monitoring and evaluation, which is participatory and where 'gender disaggregated data' will be collected and analysed. Where possible, women and youth will be encouraged to participate in monitoring activities.

6. Knowledge Management, Information Sharing and Reporting

UN-Habitat aims to have a gender responsive knowledge management approach in place, where specific gender considerations are highlighted through reporting on the project/programme's commitment to gender equality and women's empowerment in all outreach, communication and information sharing efforts.

ANNEX 6: Budget notes

Table 51: Budget notes

Outputs	Activities	Notes / Staff	TOTAL	Year	Year	Year	Year		No	Salary Base Rate	Rate	Year	Year	Year	Year		
				1	2	3	4					1	2	3	4	T	
												12	12	12	12	48	
Project components																	
Output 1.1 Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed (Lebanon)	Phase 1: assessment	Launching and discussing assessment approach and outcomes	Workshop	4,000	4,000	-	-	-		1		2,000	2				2
		General methodology and framework	Spatial / urban planner	28,000	28,000	-	-	-		2		3,500	4				4
		Climate change dynamics and mapping and analysis	Climate change expert	7,000	7,000	-	-	-		1		3,500	2				2
		Urbanization dynamics mapping and analysis	Climate change expert + GIS expert	7,000	7,000	-	-	-		1		3,500	2				2
		Agricultural dynamics mapping and analysis	Agriculture expert	7,000	7,000	-	-	-		1		3,500	2				2
		Water issues mapping and analysis	Water expert	7,000	7,000	-	-	-		1		3,500	2				2
		Soil issues mapping and analysis	Hydrology expert	7,000	7,000	-	-	-		1		3,500	2				2
		Complementary field investigations	Field expert	7,000	7,000	-	-	-		1		3,500	2				2
		Transversal analysis	Spatial / urban planner	14,000	14,000	-	-	-		2		3,500	2				2
	Phase 2: planning scenarios	Drafting phase 1 report: Assessment outcomes	Spatial / urban planner	2,500	2,500	-	-	-		1		2,500	1				1
		Identifying and projecting possible scenarios	Spatial / urban planner + GIS expert	7,000	7,000	-	-	-		1		3,500	2				2
		Discussing and adopting most probable scenario	Spatial / urban planner + Workshop	9,000	9,000	-	-	-		2		3,500	1				1
		Defining main needed adaptation responses to this scenario	Spatial / urban planner - CC, Agri, Wa exp	14,000	14,000	-	-	-		2		3,500	2				2
		Setting a monitoring framework (follow up indicators, etc.)	Spatial / urban planner	3,500	3,500	-	-	-		1		3,500	1				1
		Contingency roadmap for sudden changes in adopted scenario	Spatial / urban planner - CC, Agri, Wa exp	7,000	7,000	-	-	-		2		3,500	1				1
		Drafting Phase 2 report: Planning / development scenarios	Spatial / urban planner	3,500	3,500	-	-	-		1		3,500	1				1
		Phase 3: implement strategy / guidelines	Strategy / guidelines for BWE	Spatial / urban planner	14,000	14,000	-	-	-		2		3,500	2			
	Strategy / guidelines for DGU		Spatial / urban planner	14,000	14,000	-	-	-		2		3,500	2				2
	Strategy / guidelines MoA		Spatial / urban planner	14,000	14,000	-	-	-		2		3,500	2				2
	Training BWE, DGU, MoA on use of guidelines		Spatial / urban planner	14,000	14,000	-	-	-		2		3,500	2				2
	Drafting Phase 3 report: Strategy / guidelines		Spatial / urban planner	3,500	3,500	-	-	-		1		3,500	1				1

		Presenting and discussing outcomes	Workshop	2,000	2,000	-	-	-	1		2,000	1			1	
		Communication / publication	Printing, etc.	5,000	5,000	-	-	-	1		5,000	1			1	
		Sub Project Coordination	Technical support to execute output 1.1 activities	48,000	48,000	-	-	-	1		4,000	12			12	
Sub-total				249,000	249,000	-	-	-								
Output 1.2. Urban master plans at municipal level with climate change and gender mainstreamed (Lebanon)	Phase 1: assessment	Launching, participatory and assessment session	Workshop	64,000	64,000	-	-	-	8		2,000	4			4	
		Mapping dynamics in 8 municipalities	Spatial / urban planner / GIS expert	56,000	49,000	7,000	-	-	2		3,500	7	1		8	
		CC / Water/ Agri / Soil risks and opportunities	CC, Wa, Agri, Hydro exp	72,000	60,000	12,000	-	-	4		3,000	5	1		6	
		Drafting Phase 1 assessment reports for the 8 municipalities	Spatial / urban planner	21,000	-	21,000	-	-	3		3,500		2		2	
	Phase 2: plan	Development orientations and land use strategies	Spatial / urban planner	28,000	-	28,000	-	-	2		3,500		4		4	
			Workshop	16,000	-	16,000	-	-	8		2,000		1		1	
		Drafting Phase 2 proposition strategies for the 8 municipalities	Spatial / urban planner	21,000	-	21,000	-	-	3		3,500		2		2	
	Phase 3 Complement	Planning complementarity at the level of the Central Bekaa	Spatial / urban planner	21,000	-	21,000	-	-	3		3,500		2		2	
			Workshop	4,000	-	4,000	-	-	2		2,000		1		1	
		Drafting Phase 3 report: complementary	Spatial / urban planner	3,500	-	3,500	-	-	1		3,500		1		1	
	Phase 4 Implement	Localized action plans and conceiving potential urban design interventions	Spatial / urban planner	10,500	-	10,500	-	-	1		3,500		3		3	
			Urban Designer	10,500		10,500	-	-	1		3,500		3		3	
			Water Expert	3,500		3,500	-	-	1		3,500		1		1	
			Agricultural Expert	3,500		3,500	-	-	1		3,500		1		1	
			CC and DRR Expert	3,500	-	3,500	-	-	1		3,500		1		1	
			Field investigators	9,000		9,000	-	-	2		1,500		3		3	
			Drafting Phase 4 report: action plans and feasibility assessments	Spatial / urban planner	7,000	-	7,000	-	-	1		3,500		2		2
		Sub Project Coordination	Technical support to execute output 1.2 activities	72,000	36,000	36,000			2		4,000	9	9			
		Communication / publication	Printing, etc.	6,000	4,000	2,000	-	-	1		2,000	2	1		3	
	Phase 5: Operate and sustain	Establish and running of urban observatory (1) to collect and analyse climate change data, and plan and revise plans with climate change data	Capacity building and training on GIS, Oracle, SPSS, localization of SDGs, climate data, etc.	20,000	7,500	7,500	2,500	2,500	1		2,500	3	3	1	1	8
			Personnel	18,000	4,500	4,500	4,500	4,500	1		1,500	3	3	3	3	12
			Equipment, software and office supply	20,000	20,000	-	-	-	1		20,000	1				1

			Satellite imagery and maps	15,000	5,000	5,000	5,000	-	1		5,000	1	1	1		3
			Portal and smart application	25,000	10,000	5,000	5,000	5,000	1		5,000	2	1	1	1	5
Sub-total				530,000	260,000	241,000	17,000	12,000								
Output 1.3. Urban master plans at municipal level with climate change and gender mainstreamed (Jordan)	Phase 1: assessment	Launching, participatory and assessment session	Workshop	64,000	64,000	-	-	-	8		2,000	4				4
		Mapping dynamics in 2 municipalities (Mafraq; Irbid)	Spatial / urban planner / GIS expert	56,000	49,000	7,000	-	-	2		3,500	7	1			8
		CC / Water/ Agri / Soil risks and opportunities	CC, Wa, Agri, Hydro exp	72,000	60,000	12,000	-	-	4		3,000	5	1			6
		Drafting Phase 1 assessment reports for the 2 municipalities	Spatial / urban planner	21,000	-	21,000	-	-	3		3,500		2			2
	Phase 2: plan	Development orientations and land use strategies	Spatial / urban planner	28,000	-	28,000	-	-	2		3,500		4			4
			Workshop	16,000	-	16,000	-	-	8		2,000		1			1
		Drafting Phase 2 proposition strategies for the 2 municipalities	Spatial / urban planner	21,000	-	21,000	-	-	3		3,500		2			2
	Phase 3: Complement	Planning complementarity at the water authorities level	Spatial / urban planner	21,000	-	21,000	-	-	3		3,500		2			2
			Workshop	4,000	-	4,000	-	-	2		2,000		1			1
		Drafting Phase 3 report: complementary	Spatial / urban planner	3,500	-	3,500	-	-	1		3,500		1			1
	Phase 4: Implement	Localized action plans and conceiving potential urban design interventions	Spatial / urban planner	10,500	-	10,500	-	-	1		3,500		3			3
			Urban Designer	10,500		10,500	-	-	1		3,500		3			3
			Water Expert	3,500		3,500	-	-	1		3,500		1			1
			Agricultural Expert	3,500		3,500	-	-	1		3,500		1			1
			CC and DRR Expert	3,500	-	3,500	-	-	1		3,500		1			1
			Field investigators	9,000		9,000	-	-	2		1,500		3			3
		Drafting Phase 4 report: action plans and feasibility assessments	Spatial / urban planner	7,000	-	7,000	-	-	1		3,500		2			2
		Communication / publication	Printing, etc.	12,000	-	12,000	-	-	8		2,000		1			1
	Phase 5: Operate and sustain	Support the running of urban observatories (2) to collect and analyse climate change data, and plan and revise plans with climate change data	Capacity building and training on GIS, Oracle, SPSS, localization of SDGs, climate data, etc.	40,000	15,000	15,000	5,000	5,000	2		2,500	3	3	1	1	8
			Personnel	36,000	9,000	9,000	9,000	9,000	2		1,500	3	3	3	3	12
			Equipment, software and office supply	40,000	40,000	-	-	-	2		20,000	1				1
			Satellite imagery and maps	30,000	10,000	10,000	10,000	-	2		5,000	1	1	1		3
			Portal and smart application	50,000	20,000	10,000	10,000	10,000	2		5,000	2	1	1	1	5

Sub-total				562,000	267,000	237,000	34,000	24,000										
TOTAL Component 1				1,341,000	776,000	478,000	51,000	36,000										
Output 2.1 Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rain Water Harvesting (RWH) in Lebanon	Phase 1: assessment	Detailed technical assessment of target buildings (UNICEF)	Site assessments	2,000	2,000	-	-	-	1			100	20				20	
			RWH specialist / field engineer	3,000	3,000	-	-	-	1		3,000	1				1		
	Phase 2: plan	Detailed technical design of systems (UNICEF)	RWH specialist	12,000	12,000	-	-	-	1		3,000	4					4	
	Phase 4: O & M	Awareness raising and capacity building focused on water scarcity challenges in target buildings (LARI/ Private Sector)	Awareness raising campaign in target buildings about climate change-related water scarcity challenges and adaptation options, incl. RWH through religious & governmental buildings, and educational & health facilities	12,500	2,500	5,000	5,000	-	1		2,500	1	2	2			5	
			Awareness raising and capacity building to operate and maintain project activities (LARI/ Private Sector)	30,000	-	10,000	10,000	10,000	1		1,000		10	10	10		30	
			Evaluating water use for urban usages study	15,000	-	-	-	15,000	1		15,000				1		1	
			Operation & maintenance plans for target buildings	12,600	-	6,300	6,300	-	1		150		42	42			84	
			Operation & maintenance plan at municipal / ministerial level	3,000	-	-	3,000	-	1		3,000			1			1	
			Central and remote sensor and control unit for each site (for monitoring)	20,000	-	10,000	10,000	-	1		1,000		10	10			20	
			Sub Project Coordination	Technical support to execute output 2.1 activities	32,500	6,500	9,750	9,750	6,500	1		3,250	2	3	3	2		
			Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	10,000	-	-	-	10,000	1		10,000				1		1
	Technical support and coordination	Sub-project Coordination and technical support (UNICEF)	Sub-project coordination / communication (50 %)	24,800	6,200	6,200	6,200	6,200	0.5		3,100	4	4	4	4		16	
			Technical support to execute above activities (50 %)	15,000	3,750	3,750	3,750	3,750	0.5		2,500	3	3	3	3		12	
			Logistics, admin and accountancy (50 %)	3,000	750	750	750	750	0.5		1,500	1	1	1	1		4	
	Sub-total				195,400	36,700	51,750	54,750	52,200									
	Output 2.2. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.1: Rooftop Rain Water Harvesting (RWH) in Jordan	Phase 1: assessment	Detailed technical assessment of target buildings (84, of which 18 rehabilitation)	Site assessments (coordinate with output 2.3)	4,200	4,200	-	-	-	1		50	84				84	
RWH specialist / field engineer (coordinate with output 2.3)				6,000	6,000	-	-	-	1		1,500	4				4		
Phase 2: plan		Detailed technical design of systems (84, of which 18 rehabilitation)	RWH specialist / field engineer (coordinate with output 2.3)	9,000	9,000	-	-	-	1		1,500	6				6		
Phase 4: O & M		Awareness raising and capacity building to operate and maintain systems (84, of which 40 both RWH and GWTR) in target buildings	Training sessions / workshops on O&M for the target building staff, official departments and directorates, ministries' and municipalities' staff (coordinate with output 2.3)	56,400	-	25,200	25,200	6,000	1		600	42	42	10		94		

			Operation & maintenance plans for target buidings (coordinate with output 2.3)	12,600	-	6,300	6,300	-	1		150		42	42		84
			Operation & maintenance plan at municipal / ministerial level (coordinate with output 2.3)	3,000	-	-	3,000	-	1		3,000			1		1
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Under output 2.3.	-	-	-	-	-								0
	Technical support and coordination	Sub-project Coordination and technical support (Johud)	Sub-project coordination (50 %)	30,000	7,500	7,500	7,500	7,500	0.5		2,500	6	6	6	6	24
Technical support to execute activities (50 %)			15,000	3,750	3,750	3,750	3,750	0.5		2,500	3	3	3	3	12	
Logistics, admin and accountancy (50 %)			3,000	750	750	750	750	0.5		1,500	1	1	1	1	4	
Sub-total				139,200	31,200	43,500	46,500	18,000								
Output 2.3. Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for concrete adaptation output 3.3: Grey Water Treatment and Reuse (GWTR) in Jordan	Phase 1: assessment	Detailed technical assessment of target buildings (40)	Site assessments (coordinate with output 2.2)	2,000	2,000	-	-	-	1		50	40				40
			GWTR specialist / field engineer (coordinate with output 2.2)	6,000	6,000	-	-	-	1		1,500	4				4
	Phase 2: plan	Detailed technical design of systems (40)	GWTR specialist / field engineer (coordinate with output 2.2)	9,000	9,000	-	-	-	1		1,500	6				6
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain system (84, of which 40 both RWH and GWTR) in target buildings	Awareness raising campaign in target municipalities and target buildings about climate change-related water scarcity challenges and adaptation options, incl. RWH and GWR through Imams and curriculum in schools (coordinate with output 2.2)	42,000	-	21,000	21,000	-	1		500		42	42		84
			Under output 2.2.	-	-	-	-	-								0
			Under output 2.2.	-	-	-	-	-								0
			Under output 2.2.	-	-	-	-	-								0
			Central and remote sensor and control unit for each site (for monitoring) (coordinate with output 2.2)	84,000	-	42,000	42,000	-	1		1,000		42	42		84
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the GWTR systems beyond the project, incl school curriculum (coordinate with output 2.2)	15,000	-	-	-	15,000	1		15,000				1	1
	Technical support and coordination	Sub-project coordination and technical support (UNICEF Jordan)	Sub-project coordination (100 %)	40,000	10,000	10,000	10,000	10,000	1		2,500	4	4	4	4	16
			Technical support to execute above activities (100 %)	30,000	7,500	7,500	7,500	7,500	1		2,500	3	3	3	3	12
			Logistics, admin and accountancy (100 %)	6,000	1,500	1,500	1,500	1,500	1		1,500	1	1	1	1	4
	Sub-total				234,000	36,000	82,000	82,000	34,000							
Output 2.4. Community organisation, awareness and capacity building +	Phase 1: assessment	Detailed technical assessment of the irrigation canal and surrounding agricultural areas (RTO)	Site assessments + Surveying public opinion of farmers in accepting reused wastewater	9,000	9,000	-	-	-	1		1,500	6				6
			Civil/ Agricultural Engineer	13,200	13,200	-	-	-	1		2,200	6				6

operation, maintenance and replication and upscaling plans for concrete adaptation output 3.4: Efficient treatment and reuse of wastewater,from Zahle WWTP, in Lebanon	Phase 2: plan	Detailed technical design of the open canal	Civil/ Agricultural Engineer	13,200	13,200	-	-	-	1		2,200	6				6	
	Phase 4: O & M	Surveys and studies developed for understanding adaptation measures in Zahle (BWE/ Private Sector)	Development of public awareness to encourage acceptance of treated waste water and to focus on water scarcity issues in Zahle for 1,000 farmers	12,500	2,500	5,000	5,000	-	1		2,500	1	2	2		5	
		Awareness raising and capacity building to operate and maintain project activities (BWE/ Private Sector)	Training sessions / workshops / Manuals and Tools on O&M for the BWE and the Municipality of Zahle		4,500	-	1,500	1,500	1,500	1		1,500		1	1	1	3
			Provision of chemical supplies to BWE laboratory to conduct required water and wastewater sampling		50,400	14,400	14,400	14,400	7,200	1		1,200	12	12	12	6	42
			Operation & maintenance plans for target farmers		3,900	-	-	1,950	1,950	1		1,950			1	1	2
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate wastewater reuse and to ensure proper tariffs through a socio-economic study (Private Sector)	25,000	-	-	25,000	-	1		25,000			1		1	
	Technical support and coordination	Supervision of the awareness campaigns implementation and development	Sub-project Coordination/community mobilization	31,500	9,000	9,000	9,000	4,500	1		2,250	4	4	4	2	14	
Sub-total				163,200	61,300	29,900	56,850	15,150									
Output 2.5. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.5: Efficient treatment and reuse of wastewater in Jordan	Phase 3: Implement	Concrete intervention see output 3.5		-	-	-	-	-	1							0	
	Phase 4: O & M	Operate and maintain project activities.	Operation & maintenance plans for proposed interventions. Some spare parts are provided under ouput 3.5	6,000	-	-	6,000	-	1		6,000		1			1	
	Phase 5: Replicate + Scale-up	Capacity building to replicate and scale-up sub-project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate cc resilient WWTPs beyond the project	10,000	-	-	-	10,000	1		10,000				1	1	
	Technical support and coordination	In kind		-	-	-	-	-	1							0	
Sub-total				16,000	-	-	6,000	10,000									
Output 2.6. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.6.1 Water-use-efficient irrigation of treated wastewater for fruit trees in Lebanon from Zahle WWTP, Lebanon	Phase 1: assessment	Detailed technical assessment of agricultural fruit lands and irrigation systems (RTO)	Site assessments and visits to farmers	6,000	6,000	-	-	-	1		100	60				60	
			Civil/ Agricultural engineer	4,000	4,000	-	-	-	1		2,000	2				2	
	Phase 2: plan	Detailed technical design of the drip irrigation systems	Irrigation specialist	5,000	5,000	-	-	-	1		5,000	1				1	
		Phase 4: O & M	Awareness raising and capacity building trainings (LARI)	Workshop on installing and operating drip irrigation systems with practical field demonstration	15,000	7,500	7,500	-	-	1		7,500	1	1			2
			Awareness raising and capacity building to operate and maintain project	Awareness raising campaign in Zahle about climate change-related water scarcity challenges and adaptation options, incl. Fertigation	8,000	-	4,000	4,000	-	1		4,000		1	1		2

		activities (LARI/ Private Sector)	awareness for fruit trees through workshops													
			Development of existing agricultural cooperatives, technical assistance in selecting crops, irrigation methods (LARI)	15,000	-	-	15,000	-	1		15,000			1		1
			Training sessions / workshops / Tools on O&M for the target farmers	2,500	-	-	2,500	-	1		2,500			1		1
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities (LARI/ Private Sector)	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate smart and efficient drip irrigation techniques and to investigate permaculture guidelines and testing in the Central Bekaa area	20,000	-	-	20,000	-	1		20,000			1		1
	Technical support and coordination	Sub-project Coordination and technical support	Sub Project coordination and supervision	43,200	10,800	10,800	10,800	10,800	0.3		3,000	12	12	12	12	48
		Supervision of the awareness campaigns implementation and development	Community Mobilization	23,400	5,850	5,850	5,850	5,850	0.3		1,950	12	12	12	12	48
Sub-total				142,100	39,150	28,150	58,150	16,650								
Output 2.7.1 Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7:Water-use Efficient irrigation of treated wastewater from Maerad and Al Kaider WWTPs in Jordan	Phase 1: assessment	Formulate a rehabilitation study for individual farm (40) end-user/Groups based on agreed-upon climate change resilient/irrigation water need/use, cropping patterns	Preparation visits	4,000	4,000	-	-	-	1		100	40				40
			Stakeholder sessions / workshops	2,800	2,800	-	-	-	1		700	4				4
	Phase 2: plan	Water user associations established (Al-Akaidr and Al Maerad)	Preparation visits	1,200	1,200	-	-	-	1		100	12				12
			Stakeholder sessions / workshops	2,800	2,800	-	-	-	1		700	4				4
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain project activities	Capacity building of 58-60 water association members to run the association	30,000	30,000	-	-	-	1		1,000	30				30
			Capacity building of 100 farmworkers on handling reclaimed water	30,000	-	30,000	-	-	1		1,000		30			30
			Operation & maintenance plans for target irrigation systems at 40 farms	8,000	-	8,000	-	-	1		200		40			40
			Monitoring	8,000	-	-	4,000	4,000	1		100			40	40	80
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the planning approach and irrigation interventions	10,000	-	-	-	10,000	1		10,000				1	1
	Technical support and coordination	Sub-project Coordination and technical support (Johud)	Sub-project coordination (50 %)	30,000	7,500	7,500	7,500	7,500	0.5		2,500	6	6	6	6	24
			Technical support to execute activities (50 %)	15,000	3,750	3,750	3,750	3,750	0.5		2,500	3	3	3	3	12
			Logistics, admin and accountancy (50 %)	3,000	750	750	750	750	0.5		1,500	1	1	1	1	4
		Sub-total Maerad and Al Kaider		144,800	52,800	50,000	16,000	26,000								

Output 2.7.2 Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.7:Water-use Efficient irrigation of treated wastewater from Mafraq WWTP in Jordan	Phase 1: assessment	Formulate a rehabilitation study for individual farm (24) end-user/Groups based on agreed-upon climate change resilient/irrigation water need/use, cropping patterns	Preparation visits	2,400	2,400	-	-	-	1		100	24				24
			Stakeholder sessions / workshops	2,800	2,800	-	-	-	1		700	4				4
	Phase 2: plan	Water user associations established (Mafraq)	Preparation visits	600	600	-	-	-	1		100	6				6
			Stakeholder sessions / workshops	2,800	2,800	-	-	-	1		700	4				4
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain project activities	Capacity building of 24 water association members to run the association	15,000	15,000	-	-	-	1		1,000	15				15
			Capacity building of 50 farmworkers on handling reclaimed water	15,000	-	15,000	-	-	1		1,000		15			15
			Operation & maintenance plans for target irrigation systems at 40 farms	4,800	-	4,800	-	-	1		200		24			24
			Monitoring	4,800	-	-	2,400	2,400	1		100			24	24	48
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Replication / upscaling plan and guidelines to operate, maintain, sustain and replicate the planning approach and irrigation interventions	10,000	-	-	-	10,000	1		10,000				1	1
	Technical support and coordination	Sub-project Coordination (Badia)	Sub-project coordination (100 %)	30,000	7,500	7,500	7,500	7,500	1		2,500	3	3	3	3	12
			Technical support to execute activities (100 %)	20,000	5,000	5,000	5,000	5,000	1		2,500	2	2	2	2	8
			Logistics, admin and accountancy (100 %)	6,000	1,500	1,500	1,500	1,500	1		1,500	1	1	1	1	4
		Sub-total Mafraq		114,200	37,600	33,800	16,400	26,400								
Sub-total				259,000	90,400	83,800	32,400	52,400								
Output 2.8. Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.8: permaculture demonstration	Phase 1: assessment	Detailed technical studies for systems integration (plant, animal, water, energy, soil and human) (PRI)	Permaculture systems advisor (international)	24,400	24,400	-	-	-	1		6,100	4				4
	Phase 2: plan	Detailed technical design for systems integration (plant, animal, water, energy, soil and human) (PRI)	Permaculture systems advisor (international)	24,400	24,400	-	-	-	1		6,100	4				4
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain project activities (PRI)	Workshops to involve surrounding communities (site visits and design and operation training)	10,000	3,000	3,000	2,000	2,000	1		1,000	3	3	2	2	10
			Operation & maintenance plan	2,000	-	2,000	-	-	1		2,000		1			1
			Online Permaculture Design Certificate Course (28 modules, released weekly + final design exercise at JUST land or land owned by local community members. Cost per student	170,000	42,500	42,500	42,500	42,500	50		850	1	1	1	1	4
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate	Workshops to involve surrounding communities (site visits and replication training)	4,000	-	-	2,000	2,000	1		1,000			2	2	4

		and scale-up project activities (PRI)	Replication / upscaling plan and guidelines, incl. permaculture landscape design plan for surrounding communities	5,000	-	-	-	5,000	1		5,000				1	1
	Technical support and coordination	Sub-project Coordination (PRI)	Sub-project coordination / strategic advisor (internat) (100 %)	48,800	12,200	12,200	12,200	12,200	1		6,100	2	2	2	2	8
			Technical support to execute activities (100 %)	20,000	5,000	5,000	5,000	5,000	1		2,500	2	2	2	2	8
			Logistics, admin and accountancy (100 %)	6,000	1,500	1,500	1,500	1,500	1		1,500	1	1	1	1	4
Sub-total				314,600	113,000	66,200	65,200	70,200								
Output 2.9: Community organisation, awareness and capacity building + operation, maintenance and replication and upscaling plans for concrete adaptation output 3.9; permaculture demonstration	Phase 1: assessment	Identification of agriculture practices, lands, farmers	Regional Technical Office	7,700	7,700	-	-	-	1		1,925	4				4
	Phase 2: plan	Detailed technical guidelines for agriculture waste management and sustainable crop production	Printing, etc.	10,000	-	-	-	10,000	1		10,000				1	1
	Phase 3: Implement	Concrete intervention see output 3.8														0
	Phase 4: O & M	Awareness raising and capacity building to operate and maintain project activities	Operation & maintenance plan and upgrade of LARI's mobile application to include: - All tested crops varieties affected and suitable for climate change - A list of farmers in the area (connecting farmers together) - Broadcasting all technical guidelines and best practices that pertain to the project and beyond it	10,000	-	10,000	-	-	1		10,000		1			1
			Training/Workshop for farmers on Permaculture practices +LARI to give out certificates and books/study materials to farmers that attend training on Permaculture (3 per year (30 participants per workshop = 270 participants in total) over 3 year span) (participants to receive all material)	241,070	80,357	80,357	80,357	-	1		893	90	90	90		270
	Phase 5: Replicate + Scale-up	Awareness raising and capacity building to replicate and scale-up project activities	Workshops to involve surrounding communities (site visits and replication training)	4,000	-	-	2,000	2,000	1		1,000			2	2	4
			Replication / upscaling plan and guidelines, incl. permaculture landscape design plan for surrounding communities	5,000	-	-	-	5,000	1		5,000				1	1
	Technical support	Sub-project Coordination (LARI)	Permaculture expert (International) (20%)	28,800	7,200	7,200	7,200	7,200	0.2		3,000	12	12	12	12	48
			Project Management Assistant (National) (20%)	14,400	3,600	3,600	3,600	3,600	0.2		1,500	12	12	12	12	48
			Senior strategic project management systems expert & permaculture systems advisor (National) (20%)	43,200	10,800	10,800	10,800	10,800	0.2		4,500	12	12	12	12	48
			LARI operation costs (20%)	24,000	6,000	6,000	6,000	6,000	0.2		2,500	12	12	12	12	48
			Logistics, admin and accountancy (100 %)	6,000	1,500	1,500	1,500	1,500	1		1,500	1	1	1	1	4
		Sub Project Coordination	Sub Project coordination and supervision (20%)	24,000	6,000	6,000	6,000	6,000	0.2		2,500	12	12	12	12	48
Sub-total				418,170	123,157	125,457	117,457	52,100								

TOTAL Component 2				1,881,670	530,907	510,757	519,307	320,700								
Output 3.1 Rooftop Rain Water Harvesting (RWH) in Lebanon + show room	Phase 3: Implement (concrete measures)	Install and connect 20 large RWH systems (11 educational facilities, 7 religious buildings, 1 health facility, and 1 governmental building) with the water supply network, including the digging of rain-harvesting cisterns and mounting rectangular tanks 1,410 m3. (UNICEF)	Collection System (Gutters, Drains, Pumps, Accessories)	54,800	-	27,400	27,400	-	1		2,740		10	10		20
			Water Treatment systems (Media filter, Micro Filter, Chlorination tanks and dosage pumps)	111,682	-	55,841	55,841	-	1		5,584		10	10		20
			Reinforced concrete water tanks (with excavations, waterproofing, ladders, valves, reinstatement, etc.)	263,656	-	131,828	131,828	-	1		13,183		10	10		20
			Plastic Water tanks (including Excavation, subgrade, fencing and ladders)	303,212	-	151,606	151,606	-	1		15,161		10	10		20
	Show room (1) with rainwater harvesting system and Water Saving Devices (WSD) (UNICEF)	43,000	-	-	43,000	-	1		43,000			1		1		
	Technical support	Supervision RWH system installation and maintenance (UNICEF Lebanon)	RWH engineer specialist / WASH officer (50 %)	90,912	11,364	34,092	34,092	11,364	0.5		5,682	4	12	12	4	32
Sub-total				867,262	11,364	400,767	443,767	11,364								
Output 3.2. Rooftop Rain Water Harvesting (RWH) in Jordan + show room	Phase 3: Implement (concrete measures)	Install and connect 86 small RWH systems (of which 18 rehabilitation - 2 municipal, 49 schools, 15 mosques, 20 residential) with the water supply network, including the digging of rain-harvesting cisterns and mounting rectangular tanks 30-60 m3.	Per system including tank, pumps, pipes and surface rehabilitation	688,000	-	352,000	336,000	-	1		8,000		44	42		86
			Transportation	8,820	-	4,410	4,410	-	1		105		42	42		84
			Show room (2) with RWH system, GWTR system and Water Saving Devices (WSD)	100,000	-	100,000	-	-	1		50,000		2			2
	Technical support	Supervision RWH system installation and maintenance (Johud)	RWH enigneer specialist / WASH officer (50 %)	40,000	5,000	15,000	15,000	5,000	0.5		2,500	4	12	12	4	32
	Sub-total				836,820	5,000	471,410	355,410	5,000							
Output 3.3. Grey Water Treatment and Reuse (GWTR) in Jordan	Phase 3: Implement (concrete measures)	Install / construct and connect 40 GWTR systems with toilets and gardening water supply (35 schools, 5 mosques)	Per system including tank, pumps, pipes and surface rehabilitation	320,000	-	160,000	160,000	-	1		8,000		20	20		40
			Transportation	4,200	-	2,100	2,100	-	1		105		20	20		40
			Rehabilitation and modification of WASH blocks for greywater reuse in toilet flushing and for greening purposes	428,000	-	214,000	214,000	-	1		10,700		20	20		40
	Technical support	Supervision GWTR system and blocks installation and maintenance (UNICEF Jordan)	RWH engineer specialist / WASH officer (50 %)	90,912	11,364	34,092	34,092	11,364	0.5		5,682	4	12	12	4	32
	Sub-total				843,112	11,364	410,192	410,192	11,364							

Output 3.4. Efficient treatment and reuse of wastewater from Zahle WWTP, in Lebanon	Phase 3: Implement (concrete measures)	Reuse of the Zahle WWTP effluent for irrigation through diverting the plant's treated effluent to agricultural fields and treating sludge for fertilizers usage - 116 Hectares of Agricultural lands	Construction of a 3000 m open channel (1x1 meters with 0.25m thick walls)	795,000	-	795,000	-	-	-	1		265		3000			
	Technical support	Supervision of the irrigation system installation and maintenance	Civil works and Agricultural Engineering	21,120	4,224	16,896	-	-	-	1		2,112	2	8			10
		Surveying the alignment of the installed channel along the Litany River	Surveying works	30,000	12,000	18,000	-	-	-	1		1,500	8	12			20
Sub-total							-	-	-								
Output 3.5. Efficient treatment and reuse of wastewater in Jordan	Phase 3: Implement (concrete measures)	Maerad WWTP upgrading for increased water quality and water storage capacity for irrigation purposes	Install Storage tank (3000) m3 and flow meters distribution collector and reuse pipeline to control the pumping of treated water to farmers and to increase the no. of farmers and areas which reuse treated water	282,500	-	282,500	-	-	-	1		282,500		1			1
			Spare parts for equipment	28,250	-	28,250	-	-	-	1		28,250		1			1
			Air Blower for aeration tank	35,300	-	35,300	-	-	-	1		35,300		1			1
			Wheels for setting tanks	2,850	-	2,850	-	-	-	1		2,850		1			1
			Excess sludge pump + repair kit	5,600	-	5,600	-	-	-	1		5,600		1			1
			Polymer pump positive displacement	2,800	-	2,800	-	-	-	1		2,800		1			1
			Two platforms around dewatering units	1,400	-	1,400	-	-	-	1		1,400		1			1
			Replace inlet pipes to dewatering units from plastic to stainless steal	1,400	-	1,400	-	-	-	1		1,400		1			1
			Supply and install Y strainer for feed line to dewatering machines	707	-	707	-	-	-	1		707		1			1
			Supply new sludge screw to dewatering unit	9,900	-	9,900	-	-	-	1		9,900		1			1
			Supply conveyer belt with motor and gearbox for dewatering	5,650	-	5,650	-	-	-	1		5,650		1			1
			4 VFD fans for dewatering unit	9,900	-	9,900	-	-	-	1		1,150		1			1
			Supply Level meter for drainage tank	2,100	-	2,100	-	-	-	1		2,100		1			1
			Supply one drainage pump 18.5 kw 8-25 m H and 20-125 l/s	14,000	-	14,000	-	-	-	1		14,000		1			1
			Supply 2 flow meter for RAS, WAS pumps	14,000	-	14,000	-	-	-	1		14,000		1			1
			Install PV to compensate for energy use	10,000	-	10,000	-	-	-	1		10,000		1			1
			Sub-total Maerad				426,357	-	426,357	-	-	-					

		Al Akaider WWTP upgrading for increased water quality and water storage capacity for irrigation purposes	Install Sand trap and screen unit for inlet	67,800	-	67,800	-	-	1		67,800		1		1
			Install 2 new pumps with control panel with level control with soft start with electrical crane + pipe network installing and fabrication	113,000	-	113,000	-	-	1		113,000		1		1
			Install basket screen on inlet of storage tank to protect the pumps and ensure continues pumping for farmers	1,400	-	1,400	-	-	1		1,400		1		1
			Chlorine unit for disinfection treated water	14,100	-	14,100	-	-	1		14,100		1		1
			Maintain all gates and bridges for ponds	7,000	-	7,000	-	-	1		7,000		1		1
			Install Storage tank (2000) m3 and flow meters distribution collector and reuse pipeline to control the pumping of treated water to farmers and to increase the no. of farmers and areas which reuse treated water	198,000	-	198,000	-	-	1		198,000		1		1
			Clean anaerobic pond	71,000	-	71,000	-	-	1		71,000		1		1
			Install new pipe line from inlet to anaerobic pond	14,100	-	14,100	-	-	1		14,100		1		1
			Install PV to compensate for energy use	10,000	-	10,000	-	-	1		10,000		1		1
		Sub-total Al Akaider		496,400	-	496,400	-	-							
		Mafraq WWTP upgrading for increased water quality for irrigation purposes	Spare parts for equipment	28,250	-	28,250	-	-	1		28,250		1		1
			two Soft starter for pumps of lift station	8,400	-	8,400	-	-	1		8,400		1		1
			Two aerator units for ponds	12,125	-	12,125	-	-	1		12,125		1		1
			One irrigation pump (higher head for far area) to increase the area which reuses treated water	35,300	-	35,300	-	-	1		35,300		1		1
			One lifting pump, one primary sludge pump	28,000	-	28,000	-	-	1		28,000		1		1
			Modify conveyor belt of screen by install new mechanical belt conveyor	8,500	-	8,500	-	-	1		8,500		1		1
			Install PV to compensate for energy use	10,000	-	10,000	-	-	1		10,000		1		1
		Sub-total Mafraq		130,575	-	130,575	-	-							
	Technical support	Supervision WWTPs ugradings measures installation and maintenance (WAJ / Yarmouk)	In-kind												
Sub-total				1,053,332	-	1,053,332	-	-							
Output 3.6. Water-use-efficient	Phase 3: Implement	Installation of drip irrigation systems (150 ha) for fruit	Drip Irrigation (including pumps and filters)	939,000	-	469,500	469,500	-	1		6,260		75	75	150

irrigation of treated wastewater for fruit trees in Lebanon from Zahle WWTP, Lebanon	(concrete measures)	trees, vineyards and potato plantation	Sensors, automated tools (includes valves, regulators, fittings)	3,750	-	1,875	1,875	-	-	1		25		75	75		150
	Technical support	Supervision of the irrigation system installation and maintenance	Civil works and Agricultural Engineering	46,200	6,600	26,400	13,200	-	-	1		2,200	3	12	6		21
Sub-total				988,950	6,600	497,775	484,575	-	-								
Output 3.7.1 Water-use Efficient irrigation of treated wastewater from Maerad and Alkaider WWTPs in Jordan	Phase 3: Implement (concrete measures)	Connect WWTPs stored water with farm lands	4 KMs conveyor pipeline 6' size	120,000	-	120,000	-	-	-	1		30		4000			4000
			Installation 4000 m	20,000	-	20,000	-	-	-	1		5		4000			4000
		Establish a new modern water irrigation system connecting main water irrigation pipe with farm lands (120 dunums)	For 120 dunum	240,000	-	240,000	-	-	-	1		2,000		120			120
	Technical support	Supervision irrigation system installation and maintenance (Johud)	Irrigation specialist / field engineer (50 %)	26,400	4,800	14,400	3,600	3,600	-	0.4		3,000	4	12	3	3	22
		Sub-total irrigation from Mearad and Al Akaider		406,400	4,800	394,400	3,600	3,600	-								
	Output 3.7.2 Water-use Efficient irrigation of treated wastewater from Mafrag WWTP in Jordan	Phase 3: Implement (concrete measures)	Establish a new modern water irrigation system connecting water ponds with farm lands (100 dunum) (Badia)	For 100 dunums	200,000	-	200,000	-	-	-	1		2,000		100		
Establish new water ponds (15) with surface pumps and filters at farm lands				150,000	-	150,000	-	-	-	1		10,000		15			15
Technical support		Supervision irrigation system installation and maintenance (Badia)	Irrigation specialist / field engineer (100 %)	48,000	6,000	36,000	3,000	3,000	-	1		3,000	2	12	1	1	16
		Sub-total irrigation from Mafrag		398,000	6,000	386,000	3,000	3,000	-								
Sub-total					804,400	10,800	780,400	6,600	6,600	-							
Output 3.8. Permaculture demonstration - closed loop water system in Jordan	Phase 3: Implement (concrete measures)	Bio-Fertilizer production	Compost turner	30,000	30,000	-	-	-	-	1		30,000	1				1
			Tractor Massey Ferguson	30,000	30,000	-	-	-	-	1		30,000	1				1
			Woodchipper	4,000	4,000	-	-	-	-	1		4,000	1				1
			Compost tea brewer 20 litres	2,000	2,000	-	-	-	-	1		2,000	1				1
			Microscope with display scree	3,000	3,000	-	-	-	-	1		3,000	1				1
			Mulch bales	8,800	1,600	2,400	2,400	2,400	-	50		4	8	12	12	12	44
			Manure (truck load)	13,200	2,400	3,600	3,600	3,600	-	4		75	8	12	12	12	44
			Diesel average per litre	880	160	240	240	240	-	10		2	8	12	12	12	44
		Crop Garden and Compost Egg laying Chickens	Poly tunnels	9,450	9,450	-	-	-	-	3		3,150	1				1
			Irrigation	550	550	-	-	-	-	1		550	1				1
			Chicken Caravan 30, 2 electric fences, solar electric energiser	4,400	4,400	-	-	-	-	1		4,400	1				1
			Feed for 30 chickens	1,288	322	322	322	322	-	1		322	1	1	1	1	1

			Hand tools, 2 wheelbarrows, 2 rakes, 2 shovels, 2 hoes, 2 pruners, 2 loppers, 2 pruning saws, 2 pitch forks	300	300	-	-	-	1		300	1				1		
			Seeds and Seedslings	720	180	180	180	180	1		180	1	1	1	1	4		
		Bees: Apiculture	3 flow hives; 3 colonies; 3 hives full of bees; stainless steel spinner extractor; smoker; seperator; 3 top boxes; brush; suit; gloves; wax capping knife	4,200	4,200	-	-	-	1		4,200	1					1	
		Compost worms: vermicompost	5 sub-od works farms	1,000	1,000	-	-	-	1		1,000	1					1	
		Olive Orchard Monoculture Conversion to Food Forest (1,000m2)	Irrigation	550	550	-	-	-	1		550	1					1	
			Chicken caraven 30, 2 electric net fence, solar electric energiser	4,400	4,400	-	-	-	1		4,400	1					1	
			Feed for 30 chickens	1,288	322	322	322	322	1		322	1	1	1	1	1	4	
			Trees	720	180	180	180	180	1		180	1	1	1	1	1	4	
			Seeds	300	75	75	75	75	1		75	1	1	1	1	1	4	
		Technical support	Supervision Permeculture demonstration site installation and maintenance	Permaculture expert (National)	120,000	48,000	24,000	24,000	24,000	1		2,000	24	12	12	12	60	
				Agriculture labourers (National)	57,600	14,400	14,400	14,400	14,400	2		600	12	12	12	12	48	
				Strategic advise / expert (International)	42,700	24,400	6,100	6,100	6,100	1		6,100	4	1	1	1	7	
	Permaculture systems advisor (international)			42,700	24,400	6,100	6,100	6,100	1		6,100	4	1	1	1	7		
	Sub-total				384,046	210,289	57,919	57,919	57,919									
	Output 3.9. Permaculture demonstration - closed loop water system in Lebanon	Phase 3: Implement (concrete measures)	Agricultural Waste Management for Sustainable Crop Production	Tractors Massey Ferguson (3)	90,000	90,000	-	-	-	3		30,000	1				1	
				Medium sized Compost Turners (6)	30,000	30,000	-	-	-	6		5,000	1					1
				Woodchippers (3)	12,000	12,000	-	-	-	3		4,000	1					1
				Pruning Tools for Farmers (16)	3,200	3,200	-	-	-	16		200	1					1
				Mulch, 25 bales per month (\$3.6/bale)	4,320	1,080	1,080	1,080	1,080	25		3.6	12	12	12	12	48	
				Manure truck load, 2 per month	7,200	1,800	1,800	1,800	1,800	2		75	12	12	12	12	48	
Diesel average (\$1.5/L; 960L/year)				11,520	2,880	2,880	2,880	2,880	3		80	12	12	12	12	48		
Compost tea brewers 20 litres (3)				6,000	6,000	-	-	-	3		2,000	1						
Scoop Shovels (16)				480	480	-	-	-	16		30	1						
Pitchforks (16)				480	480	-	-	-	16		30	1						
Lab materials and kits for in-lab analysis/testing (1 set)				5,000	5,000	-	-	-	1		5,000	1						
Woodbeds for biofertilizer fermentation (16)				960	960	-	-	-	16		60	1						

		Subpod worm farms (10)	2,000	2,000	-	-	-	10		200	1				
Urban, Peri-Urban and Rural Agriculture and Water Harvesting as Adaptation Measures	11 Mobile Coop Systems, electric fences, solar electric energiser	33,000	-	16,500	16,500	-	-	11		3,000		0.5	0.5		1
	Installation of RW harvesting System + Irrigation Systems (10)	13,500	-	6,750	6,750	-	-	10		1,350		0.5	0.5		1
	Feed for 55 chickens per year, \$300/ 5 chickens/ year (11)	3,300	-	1,650	1,650	-	-	11		300		0.5	0.5		1
	Hand tools, wheelbarrows, rakes, shovels, hoes, pruners, loppers, pruning saws, pitch forks (11 each)	2,750	-	2,750		-	-	11		250		1			1
	Seeds and Seedlings per year, \$1,800/year (4 years, 10 farmers)	7,200	-	3,600	3,600	-	-	2		1,800		1	1		2
	Vertical farming tools (30 systems distributed between urban and peri-urban contexts)	4,500	-	2,250	2,250	-	-	30		150		0.5	0.5		1
Apiculture and the reduction of chemical substance use at farm level	Flow Hives (5)	3,500	-	3,500		-	-	5		700		1			1
	Colonies (5)	850	-	850		-	-	5		170		1			1
	Hives full of Bees (5)	1,800	-	1,800		-	-	5		360		1			1
	Stainless Steel Spinner Extractors (5)	1,800	-	1,800		-	-	5		360		1			1
	Smokers (5)	110	-	110		-	-	5		22		1			1
	Separators (5)	23	-	23		-	-	5		4.5		1			1
	Top boxes (5)	240	-	240		-	-	5		48		1			1
	Brush (5)	30	-	30		-	-	5		6		1			1
	Suit (5)	180	-	180		-	-	5		36		1			1
	Gloves (5)	58	-	58		-	-	5		12		1			1
	Wax capping knife (5)	125	-	125		-	-	5		25		1			1
	Constructing greenhouse/ecological charact. (4)	32,000	-	32,000		-	-	4		8,000		1			1
	Maintenance to LARI's existing greenhouse (1)	3,000	-	3,000		-	-	1		3,000		1			1
Introducing adapted crop varieties and diversifying farm production	Irrigation Systems (5)	1,750	-	1,750		-	-	5		350		1			1
	Manure Systems (5)	750	-	750		-	-	5		150		1			1
	Intercropping Systems (different types of fruit trees/legumes plantations) + New fruit trees adapted varieties for 5000 sqm (5; three seasons)	9,000	3,000	3,000	3,000	-	-	5		600	1	1	1		3
	Fodder plant seeds, legumes seeds, other plant seeds (5)	300	-	300		-	-	5		60		1			
Technical support	Supervision Permaculture demonstration site	Permaculture expert (International) (80%)	115,200	28,800	28,800	28,800	28,800	0.8		3,000	12	12	12	12	48

		installation and maintenance	Agriculture labourers (National)	55,200	13,800	13,800	13,800	13,800		2		575	12	12	12	12	48
			Project Management Assistant (National) (80%)	57,600	14,400	14,400	14,400	14,400		0.8		1,500	12	12	12	12	48
			Senior strategic project management systems expert & permaculture systems advisor (National) (80%)	172,800	43,200	43,200	43,200	43,200		0.8		4,500	12	12	12	12	48
			LARI operation costs (80%)	96,000	24,000	24,000	24,000	24,000		0.8		2,500	12	12	12	12	48
		Sub Project Coordination	Sub Project coordination and supervision (80%)	96,000	24,000	24,000	24,000	24,000		0.8		2,500	12	12	12	12	48
Sub-total				885,725	307,080	236,975	187,710	153,960									
TOTAL Component 3				7,509,767	578,721	4,738,666	1,946,173	246,207									
Output 4.1. Regional / international KM with focus on project lessons sharing and replication (incl. international seminars and regional platforms & policy dialogue)		UN- ESCWA seminars and knowledge sharing in Jordan or Lebanon: targeting regional steering committee members (national and city government officials) to participate	See output 4.2 (SC members travel)	-	-	-	-	-									0
		Regional workshops and International seminars / events focused specifically on climate change and urban development, incl. refugee crisis implications (AMFHUD ; WUF, COP side events (2x); AFSD; HLPF 2022 reviewing SDG 11 and 6 and HLPD 2023): targeting regional steering committee members (national and city government officials) + other key stakeholders to participate	Regional workshops and International seminars / events focused on climate change, urban development and refugee crisis implications (incl. travel and daily allowance for accommodation, etc.)	200,000	25,000	25,000	75,000	75,000		10		2,500	1	1	3	3	8
		Through Arab Centre for Climate Change Policies; set-up community of practices on climate change in urban areas with implications refugee crisis (with documentation of good practices and lessons; replication package; project video; knowledge products uploaded) linked to ACCCP knowledge platform	Communication outputs (publications, digital platform, video: project baseline and results, incl. human interest story)	80,000	20,000	10,000	20,000	30,000		1		10,000	2	1	2	3	8
		For all above:	see output 4.2 (communication officer)	-	-	-	-	-									0
	Sub-total				280,000	45,000	35,000	95,000	105,000								
Output 4.2. Jordan and Lebanon KM with focus on project progress, best practices and lessons		Jordan and Lebanon Project Steering committee meetings in Lebanon or Jordan (to align with ESCWA relevant events - see 4.1.)	SC workshop organisation	64,000	16,000	16,000	16,000	16,000		1		8,000	2	2	2	2	8

learned shared + capacity building		Platform / working space (electronic) used for project communication and sharing lessons (research; project best practice and lessonse learned, incl. field visits)	SC travel and daily allowance for accommodation, etc. (also covering exchange visits and ESCWA events as side events - see 4.1., where possible)	184,400	55,320	36,880	36,880	55,320		20		922	3	2	2	3	10
			Project field visits	18,000	2,000	4,000	6,000	6,000		1		2,000	1	2	3	3	9
		For all above:	Communication officer (see above)	155,400	33,300	44,400	33,300	44,400		1		3,700	9	12	9	12	42
		For all above:	Admin / travel support	16,000	4,000	4,000	4,000	4,000		1		2,000	2	2	2	2	8
Sub-total				437,800	110,620	105,280	96,180	125,720									
Output 4.3. Sub-national KM and Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities		Institutional set-up territorial observatories (in universities) in target areas	Spatial / urban planner	28,000	-	28,000	-	-		2		3,500		4			4
			IT expert	20,000	-	20,000	-	-		2		2,500		4			4
		Geo-referenced database and an online platform to share data produced and linked with ESCWA database	Database	60,000	-	20,000	20,000	20,000		2		10,000		1	1	1	3
		Regional' urban risks and vulnerabilities assessment, planning and management approach model for type 2 cities (including replication guidelines and online module)	Climate Change Expert	21,000				21,000		1		3,500				6	6
			Spatial / urban planner	21,000	-	-	-	21,000		1		3,500				6	6
			Communication / publication	15,000	-	-	-	15,000		1					1	1	
	Sub-total				165,000	-	68,000	20,000	77,000								
Output 4.4. Incentive mechanism (financial) and regulatory framework to replicate and upscale rainwater harvesting activities		Identification of effective incentive mechanism (financial) and regulatory framework to repliace and upscale (i.e. national programme) rainwater harvesting activities, esp. in Jordan	Consultant	36,000	-	-	36,000	-		1		6,000			6		6
		Travel	2 missions	4,362	-	-	-	4,362		2		2,181				1	1
Sub-total				40,362	-	-	36,000	4,362									
TOTAL Component 4				923,162	155,620	208,280	247,180	312,082									
TOTAL Components				11,655,599	2,041,248	5,935,703	2,763,660	914,989									
Project execution costs																	
Project execution		Jordan	Regional Project coordination (regional - international)	264,000	66,000	66,000	66,000	66,000		1		11,000	6	6	6	6	24
			Admin / financial procurement (regional - national)	63,000	15,750	15,750	15,750	15,750		1		1,750	9	9	9	9	36
			M & E and communication (regional - national)	36,000	9,000	9,000	9,000	9,000		1		1,500	6	6	6	6	24

			Safeguarding system (AF) compliance (regional - national)	36,000	9,000	9,000	9,000	9,000	1		1,500	6	6	6	6	24
			Engineer water / cc focused (regional - national)	99,000	36,000	27,000	18,000	18,000	1		3,000	12	9	6	6	33
			National Project coordination/Urban Planner (national)	180,000	45,000	45,000	45,000	45,000	1		5,000	9	9	9	9	36
			Driver (national)	16,800	4,200	4,200	4,200	4,200	1		1,400	3	3	3	3	12
	Travel		Related to Jordan staff travel	21,810	6,543	4,362	4,362	6,543	1		2,181	3	2	2	3	10
	Lebanon		National Project coordination/Urban Planner (national)	180,000	45,000	45,000	45,000	45,000	1		5,000	9	9	9	9	36
			Water Engineer (regional - national)	108,000	36,000	36,000	18,000	18,000	1		3,000	12	12	6	6	36
			Admin / procurement (regional - national)	63,000	15,750	15,750	15,750	15,750	1		1,750	9	9	9	9	36
			Communication (national)	28,800	7,200	7,200	7,200	7,200	1		2,400	3	3	3	3	12
			Driver (national)	16,800	4,200	4,200	4,200	4,200	1		1,400	3	3	3	3	12
	Travel		Related to Lebanon travel	16,000	4,000	4,000	4,000	4,000	1		500	8	8	8	8	32
	Operations		Vehicle Operations & Maintenance	12,000	3,000	3,000	3,000	3,000	2		250	6	6	6	6	24
			Office Rent	32,000	8,000	8,000	8,000	8,000	2		2,000	2	2	2	2	8
			Communication	13,000	1,000	1,000	1,000	10,000	1		1,000	1	1	1	10	13
			Office Supplies and Stationery	12,000	3,000	3,000	3,000	3,000	2		250	6	6	6	6	24
	Final evaluation		Independent (lump sum)	25,000	-	-	-	25,000	1		25,000				1	1
TOTAL Execution costs				1,223,210	318,643	307,462	280,462	316,643								
TOTAL Project costs				12,878,809	2,359,891	6,243,165	3,044,122	1,231,632								
Project cycle management fee costs																
Project cycle management		1.25%	UN-H ROAS overall project supervision, incl. AF and UN-H policies (esp ESP and GP) and regulations compliance and regional admin, coordination and travel	160,985	29,499	78,040	38,052	15,395								
		0.25%	UN-H ROAS M & E, incl. Travel	32,197	5,900	15,608	7,610	3,079								
		7%	UN-H HQ Overall project supervision, incl .compliance to UN-H policies (gender, human rights, climate change, etc.)	901,517	165,192	437,022	213,089	86,214								
TOTAL management fee		8.50%		1,094,699	200,591	530,669	258,750	104,689								
TOTAL amount of financing requested				13,973,508	2,560,481	6,773,834	3,302,872	1,336,321								

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ANNEX 7: Milestones

Output	Outputs	Activities/Notes	Unit	Year 1	Year 2	Year 3	Year 4
1.1	Territorial planning and development strategy / guidelines at district level with climate change and gender mainstreamed						
	Phase 1: Assessment	Preparation and participation set-up (key stakeholders and committee); launching activities; Content (ongoing and analysis of dynamics and impacts of urbanization; agriculture; blue natural and artificial infra and waterbodies, etc.)	Consultancy				
	Phase 2: Planning scenarios	Identification and adoption of scenarios and response needs looking at impacts of climate change (business as usual, return of Syrian IDPs, implementation of projected large projects, etc.); setting M & E framework; defining contingency roadmap	Consultancy				
	Phase 3: Implement strategy / guidelines	Guidelines (overriding the present Water Establishment's Masterplan, in order to integrate co-existence and gender concerns and approaches; Discourage General Urban Planning in target area to be able to better integrate co and gender and water and agriculture-related concerns when overlooking building permits and validation of municipal masterplans; Ministry of Agriculture in target area, to better grasp implications of co and urbanization and water dynamics in setting their agriculture development strategies)	Consultancy				
1.2/3	Urban master plans at municipal level with climate change and gender mainstreamed						
	Phase 1: Assessment	Preparation and participation set-up (key stakeholders and committee); launching activities; Content (legal framework and existing plans; desk research; mapping of present urbanization, agricultural and water dynamics; investigation soil permeability in order to better understand risks of flooding; destabilization of natural drainage, underground water pollution and land sliding)	Consultancy				
	Phase 2: Planning	Analysis and diagnostic (data, analysis, challenges); vision and strategic definition; structure base (suitability map; urban parameters; densification and extensions; road and street network; public spaces; basic services; public facilities; environment; climate change; water supply and needs; housing and mobility; informal settlement upgrading; IDPs; heritage; land use strategies)	Consultancy				
	Phase 3: Complementary	Planning complementary with higher level authorities	Consultancy				
	Phase 4: Implementation	Action plans and feasibility studies (prioritization of actions; strategic projects; catalytic projects; capital investment plan; water - agri (technical) plan); Institutional Enablers (capacity building; participation platform); Legal enablers (planning regulations and construction code to address water scarcity); Financial enablers (External funds; internal funds) M & E	Consultancy				
	Phase 5: Operate and sustain		Municipality; RTO				
	Reports / final outputs	Reports					

2.1	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.1									
	Phase 1: Assessment	Detailed technical assessment of target buildings	UNICEF							
	Phase 2: Plan	Detailed technical design of systems	UNICEF							
	Phase 4: Operation and maintenance	Awareness raising and capacity building	LARI							
	Phase 5: Replication and upscaling	Replication guidelines	LARI							
	Technical support and coordination	Sub-project Coordination and technical support	UNICEF							
	Final outputs / reports	Reports								
2.2	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.2									
	Phase 1: Assessment	Detailed technical assessment of target buildings	JOHUD							
	Phase 2: Plan	Detailed technical design of systems	JOHUD							
	Phase 4: Operation and maintenance	Awareness raising and capacity building	JOHUD							
	Technical support and coordination	Sub-project Coordination and technical support	JOHUD							
	Final outputs / reports	Reports								
2.3	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.3									
	Phase 1: Assessment	Detailed technical assessment of target buildings	UNICEF							
	Phase 2: Plan	Detailed technical design of systems	UNICEF							
	Phase 4: Operation and maintenance	Awareness raising and capacity building	UNICEF							
	Phase 5: Replication and upscaling	Replication guidelines	UNICEF							
	Technical support and coordination	Sub-project Coordination and technical support	UNICEF							
	Final outputs / reports	Reports								
2.4	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.4.1									
	Phase 1: Assessment	Detailed technical assessment of the irrigation canal and agricultural areas	RTO							
	Phase 2: Plan	Detailed technical design of the open canal	RTO							
	Phase 4: Operation and maintenance	Surveys and studies developed for understanding adaptation measures	RTO							
		Awareness raising and capacity building to operate and maintain	RTO							
	Phase 5: Replication and upscaling	Replication guidelines	RTO							
	Technical support and coordination	Sub-project Coordination and technical support	RTO							
	Final outputs / reports	Reports								
2.5	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.5									
	Phase 4: Operation and maintenance	Operation & maintenance plans for proposed interventions	WAI / YARMOUK							
	Phase 5: Replication and upscaling	Replication guidelines	WAI / YARMOUK							
	Final outputs / reports	Reports								
2.6	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.6									
	Phase 1: Assessment	Detailed technical assessment of agricultural lands and irrigation systems	RTO							
	Phase 2: Plan	Detailed technical design of the drip irrigation systems	RTO							
	Phase 4: Operation and maintenance	Awareness raising and capacity building	RTO							
	Phase 5: Replication and upscaling	Replication guidelines	RTO							
	Technical support and coordination	Sub-project Coordination and technical support	RTO							
	Final outputs / reports	Reports								
2.7	Community organization, awareness and capacity building + operation, maintenance and replication / upscaling plans for output 3.7									
	Phase 1: Assessment	Formulate a validation study for individual farm and user/Group	JOHUD / BADIA							
	Phase 2: Plan	Water user associations established	JOHUD / BADIA							
	Phase 4: Operation and maintenance	Awareness raising and capacity building	JOHUD / BADIA							
	Phase 5: Replication and upscaling	Replication guidelines	JOHUD / BADIA							
	Technical support and coordination	Sub-project Coordination and technical support	JOHUD / BADIA							
	Final outputs / reports	Reports								
2.8	Permaculture demonstration efficient water use system									
	Phase 1: Assessment	Detailed technical studies for systems integration	Permaculture Research Institute							
	Phase 2: Plan / design	Detailed technical design for systems integration	Permaculture Research Institute							
	Phase 4: Operation and maintenance	Awareness and capacity building, maintenance plans	Permaculture Research Institute							
	Phase 5: Replication and upscaling	Replication guidelines	Permaculture Research Institute							
	Technical support and coordination	Sub-project Coordination and technical support	Permaculture Research Institute							
	Final outputs / reports	Reports								
2.9	Permaculture demonstration efficient water use system									
	Phase 1: Assessment	Detailed technical studies for systems integration	Permaculture Research Institute							
	Phase 2: Plan / design	Detailed technical design for systems integration	Permaculture Research Institute							
	Phase 4: Operation and maintenance	Awareness and capacity building, maintenance plans	Permaculture Research Institute							
	Phase 5: Replication and upscaling	Replication guidelines	Permaculture Research Institute							
	Technical support and coordination	Sub-project Coordination and technical support	Permaculture Research Institute							
	Final outputs / reports	Reports								

3.1	Rooftop Rain Water Harvesting (RWTH) in Lebanon + show room																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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