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# Climate Risk, Green Growth & Disaster Risk Reduction Assessment

Al Azraq, Jordan

SUMMARY REPORT



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# 1. Introduction and Methodology

## 1.1 Project context

The Azraq community is facing severe ecological changes in the hydrological cycle leading to extreme events such as floods, droughts and desertification. Water demand has been increasing in the township, yet water supply is decreasing. Future scenarios of the current baseline suggest a water insecure future for the township. This is combined with increasingly complex changes to the social and economic fronts of the community. This includes a population comprising Jordanians and ethnic minorities of Druze and Chechen origin, as well as a growing non-Jordanian population of refugees of Syrian and non-Syrian (Iraqis, Yemenis and Sudanese) origins. Different cultures also display a different relationship with water behaviour and use, this can cause tensions between the host and refugee community. Compounding the ecological and social stressors are the economic aspects that maintain community prosperity and vibrancy. Azraq has a high unemployment rate of 14%, similar to the national average. Green growth and a healthy but sustainable jobs industry, is required to deliver integrated current and future, environmental, social and economic benefits to the Azraq township, and beyond.

There is a need for the Azraq community in Jordan to:

- Better understand climate hazards, exposure to hazards and levels of vulnerability;
- Become better equipped to reduce vulnerability to climate risk through the uptake of information and the implementation of plans and mitigative actions;
- To effectively reduce disaster risk through early intervention opportunities; and
- To develop and invest in green jobs, markets and industry that support sustainable livelihoods while mitigating climate disaster.

The community require solutions that offer multiple benefits that address and leverage climate risk reduction, through green growth potential, including emerging green jobs and industries; and through disaster risk measures that protect people, ecosystems, infrastructure and property, and optimise livelihoods.

## 1.2 Methodology

The methodology for the assessment included the following activities:

1. Background research and literature review;
2. Stakeholder identification and engagement;
3. Capacity-building workshop and mentoring;
4. Sampling;
5. Assessment of stakeholder experiences, knowledge and opinions;
6. Assessment of climate hazards and water management knowledge;
7. Social-environmental survey;
8. Survey of green industries, growth potential and human capacity needs;
9. Climate risk analysis;

10. Evaluation of climate hazard mitigation activities and cash-for-work opportunities;
11. Evaluation of climate and disaster risk response knowledge and preparedness; and
12. Identification of appropriate skills trainings for green industries.

## 2. Key findings - summary

**1. Key climate hazards associated with the water cycle in Azraq Municipality include flash flooding and flooding, changing rain patterns, drought, and increasing pressure on the Azraq aquifer and resulting water scarcity.** Other climate hazards affecting Azraq include extreme weather events, notably frosts and heatwaves, changing seasonal characteristics, such as the disappearance of spring and autumn seasonal characteristics and desertification resulting from the impacts of floods, drought and salinization. Projections show that these impacts will continue to accelerate into the future, with the exception of frost frequency, which is likely to decrease.

**2. Flash floods and flooding are increasingly becoming a serious hazard for Azraq Municipality.** While flooding has always occurred in the area, the nature and timing of floods has shifted dramatically. Flash flooding was reported to have only begun occurring during the past decades, while destructive flood events that formerly occurred once every ten years are now occurring almost annually. *Wadis*<sup>1</sup> have increasingly become floodplains, of particular concern for the people living in them.

**3. Water scarcity is a key issue for the Azraq Municipality, overwhelmingly due to the demise of the Azraq aquifer.** Due to over extraction of water for delivery to Amman, the Azraq wetlands dried up in 1992, but increasing unsustainable levels of water abstraction continued. The impacts of this include the falling of the groundwater table, increasing salinization of the aquifer and land (the latter leading to desertification), and increasing water scarcity, all which have negative impacts on agricultural production. The health of the aquifer is threatened by the use of illegal, unlined cesspits sitting close to the water table. Climate change is projected to increase local environmental stresses and contribute to growing water scarcity.

**4. Climate and environmental hazards in Azraq Municipality have far-reaching social and economic consequences.** Farmers are deserting their farms because the cost of water or well deepening is prohibitive. Along with farm closure, the destruction of farms during flash floods and flooding reduces the number of jobs available in the area, forcing agricultural workers to seek work elsewhere or in other sectors. While land and livestock owners are reportedly most affected by destructive extreme events, vulnerable populations including non-land-owning refugees, are made more vulnerable through deterioration of housing conditions and extra expenditures necessary for repair during and after extreme events.

**5. Basic flood disaster risk and emergency response measures exist in Azraq, including a municipal emergency response team, and sandbagging and flood wall building.** However, the Municipality would benefit from a disaster management plan with an early warning system.

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<sup>1</sup> Wadis: in certain Arabic-speaking countries, refers to a valley, ravine, or channel that is dry except in the rainy season.

**6. No level of government provides compensation for loss and damages in Azraq Municipality.** While the central government reportedly provided ad-hoc compensation for flood losses in certain areas in Amman, there is no government support even in cases of very high crop losses.

**7. Cash for work (CfW) ideas summary:** There are many options for climate risk mitigation activities in the Azraq Municipality using the CfW modality. Some examples include construction of water catchments and rainwater harvesting, revegetation of flood plain areas, and installation of water and energy efficiency equipment in homes and public buildings. Sustainability of the CfW programme could be enhanced through the establishment and construction of municipal initiatives and entities that can generate income over the long-term, thus supporting ongoing employment opportunities.

**8. Local institutions had a good level of understanding of the impacts of climate change and understood that these impacts would increase into the future.** The real barrier to acting on this information appeared to be lack of funding, and lack of central government support.

**9. Participants of focus groups had good knowledge of climate change impacts, and overall, fair knowledge of disaster mitigation, and steps to enhance efficient use of water.** However, none had personally taken steps to prepare for future disasters or adapt to the changed local conditions, and overwhelmingly, respondents believed that there was nothing that they could do. Furthermore, water efficient behaviour was low among groups that used it most – i.e. water users and farmers.

**10. While green industry sectors, particularly renewable energies such as solar, have significant potential for growth in Jordan, many barriers exist.** These include access to financing, lack of government policies and regulations supporting or rewarding green industries and sustainability measures, costs of transitioning energy sources, lack of technical expertise, and lack of public awareness about green products and services and operational savings. Despite the barriers, opportunities for green industries exist in Azraq, including in the renewable and energy efficiency, water efficiency, waste management, agriculture, tourism, and sanitation sectors.

**11. There is the potential to enforce the ‘gender agenda’ in green sectors, with several projects having already successfully engaged women in green growth.** In Azraq, women are an accepted part of the workforce, and overall, are ready to engage in jobs outside the home. In some green sectors, female workers could also bring added value and provide more culturally appropriate services. Cash for Work, skills training, and employment could easily provide culturally appropriate ways for women to engage in green sectors, such as morning shifts, and working close to home.

*Table 1: Overview of green industry and growth options, matching the needs of Azraq Municipality*

Green industry sector	Skills training	Skills training level*					Selected projects conducted in the sector
		TS	T	HS	S	SS	
Renewable energies	Solar plant installation	x	x	x			<ul style="list-style-type: none"> <li>Many universities powered 100% by solar panels</li> <li>Azraq wild Jordan lodge powered by solar panels and solar water heaters</li> </ul>
	Solar plant operation	x	x	x			
	Solar plant maintenance				x		
	Rooftop solar panels: installation				x		

	Rooftop solar panels: maintenance				x		<ul style="list-style-type: none"> <li>IKEA foundation implemented two solar plants onsite and offsite Azraq Refugee Camp, providing 100% of camp electricity needs and to be handed over to government after camp closure</li> <li>Norwegian Refugee Council implemented a 2-year project 'Renewable Energy for Refugees' targeting Irbid and Mafraq households and schools.</li> </ul>
	Rooftop solar water heaters: installation				x		
	Rooftop solar water heaters: maintenance				x		
	Biogas incubator construction / installation				x		
	Biogas incubator maintenance				x		
<b>Energy efficiency</b>	Household energy efficiency technologies e.g. energy-saving lights, windows, doors, insulation: installation & maintenance				x		<ul style="list-style-type: none"> <li>Green Building Council Jordan and Habitat for Humanity have raised awareness on passive energy design in rural areas</li> <li>Jordan Energy Hackathon 2020 hosted by Zain Innovation Campus (ZINC) and Techworks, brings together youth, start-ups, organizations and refugees to find innovative solutions to humanitarian and development challenges within the energy sector.</li> </ul>
	Energy efficiency technologies in small businesses and public areas e.g. energy efficient machinery: installation, operation & maintenance				x		
	Household water efficiency technologies e.g. water-saving shower heads and taps: installation & maintenance				x		
<b>Water and water efficiency</b>	Leak detection, pipes, boilers, taps, hoses etc.		x				<ul style="list-style-type: none"> <li>Plumbing training courses for women currently provided by semi-government vocational training centres</li> <li>Several projects in Amman and other cities in Jordan supported training of female plumbers</li> </ul>
	Household water efficiency technologies e.g. water-saving shower heads and taps: installation & maintenance				x		
	Water efficiency technologies on farms e.g. drip irrigation, timer drip irrigation: installation & maintenance			x	x		
	Rainwater harvesting on farms and in gardens: construction & maintenance				x		

<b>Waste sector</b>	Municipal and community waste management	x	x	x			<ul style="list-style-type: none"> <li>Waste management and street sweeping project funded by ACF in Azraq engaged men and women</li> <li>Waste management project funded by UNHCR implemented in Zaatari Refugee camp used CfW participants to sort and divert biowaste to compost</li> <li>Canadian Federation of Municipalities provided JOD 90,000 grants in south Jordan.</li> </ul>
	Waste collection					x	
	Waste sorting				x		
	Recycling						
<b>Agriculture</b>	Climate Smart Agriculture				x		<ul style="list-style-type: none"> <li>FAO implemented a project in Azraq on agro-business to increase food security and social cohesion between Syrian refugees and Jordanians, engaging 500 beneficiaries (50%+ women), with Centre of Agricultural Research and Business Development Centre: supported improved quality of products to meet market demand</li> <li>FAO previously implemented hydroponic agriculture training project, and various Climate Smart Agriculture projects around Jordan</li> <li>Agricultural Credit Cooperation provided 8,000 loans worth JOD 27 million.</li> </ul>
	Water-saving farming methods				x		
	Hydroponic vegetable production				x		
	Treating animal diseases				x		
	Treating plant diseases				x		
	Fruit and vegetable processing				x		
	Milk and meat processing				x		
	Business management and development			x			
	Accounting and financial management						
<b>Tourism</b>	Ecotourism: conservation and tourism development			x	x		<ul style="list-style-type: none"> <li>DRC implemented the project "Empowering vulnerable refugees and host community women in Azraq through establishment of sewing and tailoring centre"</li> <li>RSCN funded a social economic project in 2017 using CfW participants for conservation and rehabilitation of reserve area and facilities. Participants were Jordanians (50%) and Syrians (50%) and overall 20% female. Participants also received specialised training as part of the programme.</li> </ul>
	Ecotourism: reserve and natural area rehabilitation			x	x	x	
	Ecotourism: wildlife and birdwatching				x		
	Business management and development			x			
	English language for tour guides			x			
	Handicraft making				x		
	Hospitality				x		
	Desludging				x	x	
<b>Sanitation cycle</b>	Sewerage treatment facility: construction, maintenance, operation	x	x	x	x	x	<ul style="list-style-type: none"> <li>NGO BORDA is in the planning stages of implementing a wastewater treatment facility, and</li> </ul>

	Safe cesspit and latrine construction & maintenance		x		x		will include developing businesses along the sanitation cycle, and training Municipality
Emergency response & disaster risk management	Flood early warning system: installation, operation, maintenance		x	x	x		
	Drought warning systems: installation, operation, maintenance		x	x	x		

*\*Skill level as defined by UNHCR:*

*TS = Technical Specialist ; T = Technical: Activity requires managerial responsibility or academic qualifications, or highly specialized technical knowledge ; HS = Highly Skilled: Position requires managerial responsibility or academic qualifications, or specific skills with a high level of training/experience ; S = Skilled: Activity requires minimal training or minimum skills necessary to perform tasks ; SS = Semi-skilled: Manual, repetitive tasks, does not require specialized skills, technical know-how or heavy physical involvement*

*NB: Trainings for different roles in one field can be conducted at different skill levels (e.g. skilled and technical).*

## 3. Conclusions and recommendations

### 3.1 Conclusions

This evaluation was undertaken to identify three key areas:

1. Identify key climate risks associated with significant changes to the water cycle (desertification/drought, flash flooding etc.) in Azraq Municipality as well as identification of potential interventions for mitigation using a cash-for-work modality.

**Conclusion 1:** Key climate risks include: flash flooding and flooding, drought, desertification, heavy rain events, extreme weather events including frosts and heatwaves, and changing seasonal characteristics.

- These risks have been observed by those interviewed in Azraq. Many of these climate risks have been documented in available literature as outlined in Annex D of the Final Report.
- It is possible that additional climate risks manifest due to changes in the hydrological and carbon cycles.
- It is highly probable that all climate risks identified will increase in intensity, frequency and duration in the future.

**Conclusion 2:** Climate risk in general was overwhelmingly understood by those interviewed and those who participated in the focus groups. This level of understanding is not typical in other communities around the world and therefore could be leveraged in building greater awareness on climate risk response and mitigative opportunities in Azraq.



**Conclusion 3:** Potential interventions for mitigation of these climate risks using a cash for work modality, have been identified in Table 2 of the Final Report.

- 20 ideas have been generated as plausible mitigation options. A longer list is likely possible following more dialogue and collaboration with other stakeholders in and outside of Azraq.
  - Opportunities for women to enter the paid workforce through this mechanism are viable.
  - Developing such opportunities offers a win-win scenario whereby:
    - a) serious and real climate risks are being addressed by future proofing measures, thereby avoiding future loss and damage;
    - b) host, refugee and ethnic minority residents of Azraq have the opportunity to make a meaningful contribution to the Municipality while building skills and generating income; and
    - c) much needed socio-economic activity is injected into the Municipality with parallel social cohesion and development programs ensuring individual and community development and empowerment.
2. Identify knowledge gaps among local institutions and community members regarding water demand management and climate hazards / response;

**Conclusion 4:** General understanding about water dualities such as scarcity and flash flooding is high among those who participated in interviews and focus groups. However, gaps were apparent when exploring water demand side management and disaster response.

- A mixed response was received when asking about water use and behaviour.
  - This suggests water conservation on a domestic front is based on what has been taught / practiced in the individual family;
  - Anecdotally, non-Jordanian's approach to water use is viewed as less conservative in general. This perception by Jordanians is likely due to a belief that Syrians and other refugees have not been exposed to the high levels of water scarcity impacting Jordanians, and therefore influencing their water conservative behaviour.
  - People in general have an opportunity to understand and learn more about individual and household water consumption patterns.
- Demand side management can be vastly improved through the uptake of water efficiency measures. Both the institutional and community levels focused almost entirely on water supply as opposed to exploring what is feasible at the demand side to conserve valuable water assets.
- Improved governance is required to send the right signal on water use and conservation of resources, as well as equalising rights. For example, currently 450 families have additional water rights provided by the King's honour system. This privilege may need to be reconsidered based on the water scarcity issues Azraq is facing. Such privileges could be perceived as setting a poor example of governance over shared local water assets.
- Observations by the experts undertaking the evaluation revealed a lack of information or awareness raising on water conservation in offices, bathrooms, hotels and including the Ecolodge in Azraq. In

other semi-arid / water scarce countries, clear signage, water restrictions and appeals for shorter (often 3 minute) showers for example, are very common.

- Both the institutional and community levels showed a worrying gap when it came to disaster risk management. Both expressed feelings of being disempowered in respect to accessing the financial and / or technical support required to better respond to disasters and engage in DRR.
  - Central Government support during and post disasters is very limited and ad-hoc.
  - Central Government support in terms of DRR for future climate risks and events for Azraq Municipality has not been provided to date.
  - Central Government support women entering the workforce and suggest it is easier for women outside of Amman, such as in Azraq, to take up DRR and green growth jobs e.g. waste and sanitation sector.
  - Central Government had not yet considered adopting, or providing disaster insurance.
  - Community members and Azraq Municipality are not insured for disaster loss and damage. Community members are not compensated if their property or livelihoods are damaged by climate events. This likely means families are becoming increasingly indebted following a disaster. In addition, under such circumstances it is highly unlikely that community members would invest in DRR measures to prevent future loss and damage.
  - Azraq Municipality was unaware of the Central Government's existing plans including: Jordan National Natural Disaster Risk Reduction Strategy 2019-2022 and the National Action Plan to Combat Desertification\_2015-2020.
  - Azraq Municipality does not have an Early Warning System in place, nor a local DRR Plan, nor plans to put one in place.
  - Azraq Municipality sees financial and technical limitations as key to holding it back in terms of its DRM progress.
  - Azraq Municipality expressed a strong desire to partner with the private sector, donors and INGOs as a way to better tackle DRR and green growth opportunities.

### 3. Identify skills trainings for green industries based on market demand.

**Conclusion 5:** Participants during interviews and focus groups were able to describe green industries and were proactive in the need to grow the industries. Some existing programmes already support green skills development, see Table 1 of this Summary Report (Table 6 in the Final Report). The industry representatives who completed the e-survey signalled interest in growing the Jordan green growth sector. However, barriers have been identified such as the need for more regulation to support a shift, incentives, subsidies or the provision of concessional loans for startup operations, including the development of manufacturing facilities.

- There are a range of programmes already operating in the green growth sectors in Azraq Municipality, these include:
  - GIZ-DRC and RSCN's wetlands restoration CfW programme;
  - DRC sewing and tailoring programme;
  - UNHCR Livelihood supported program – in and outside of Azraq Refugee Camp;
  - BORDA and CEWAS establishing a wastewater treatment facility through pond filtration;

- IKEA 5 MW solar plant at Azraq Refugee Camp;
- EDAMA and newly initiated WIRE programme for female entrepreneurs and mentorships.
- There are a range of businesses and entrepreneurial activity that Azraq Municipality suggested may be useful to pursue, these include:
  - Re-establishing the salt refinery;
  - Scaling up home food businesses, including dairy farming, vegetable production, food processing through refrigeration / cooling systems;
  - Allocating Municipal land to community members to create climate smart farming programmes, food security and products for market development;
  - Supporting the growth of the textile and sewing industry;
  - Supporting Ecotourism activities;
  - Supporting home renewable energy / solar systems;
  - Supporting home rainwater harvesting systems and better building homes (to avoid mouldy conditions).
- Only 20% of those surveyed responded positively to having a willingness to pay for green products and services. Barriers for the 80% who responded less favourably include: strict pre-committed organisational budgets, the desire / need to cut costs and minimise spending, and concerns around potential high costs, lack of accessibility, and low quality of such products in Jordan.

## 3.2 Recommendations

There are a number of recommendations that can be made following the evaluation and analysis of key findings. These are based on water security, food security and energy security across the six green growth sectors as described in Table 1 of this Summary Report (Table 6 in the Final Report). Recommendations can be categorised as short, medium and longer term and are largely based upon outreach to, and leverage of, existing programmes. In addition to partnership brokerage for new programmes and initiatives. The medium-to-long term recommendations are often next step phases of foundational work achieved through adoption of the short-term recommendations. The

The DRC has a strategic opportunity to position the organisation further into programming, advocacy and partnerships in the area of DRR combined with the green growth sector. Both in terms of on the ground actions and policy development. Such contributions can be leveraged year-on-year to embed positive change leading to a more resilient and prosperous community.

### 3.2.1 Short-term (3-6 months)

**1. Partnership brokerage: Azraq Municipality to approach The Food and Agriculture Organisation (FAO)** for support with allotting land to community members to transition plots of land, to productive farms. During the key informant interview, FAO indicated they would be interested in such a dialogue with the Municipality, particularly on the basis of promoting the whole value chain. I.e. harvested, processed and refrigerated goods, integrated with markets and distribution. FAO is well positioned to assist such a programme and to support climate smart agriculture to ensure climate risks are addressed.

This may include crop disease identification and research and crop diversification to factor in climate change impacts.

**2. Continue CfW initiatives i.e. RSCN:** The 2020 CfW partnership between DRC and the RSCN is a refinement of an earlier programme. The next phase ensures that capacity is built-in to focus on post RSCN work. This change means that refugee work placements will be slightly longer, allowing for deeper levels of on-the-job skills building that will prove beneficial beyond the length of the initial work placement. It is important for DRC to outreach to others active in the CfW programming, to further build partnerships e.g. GIZ, UNHCR, Caritas, ACT and Ministry of Labour. Also consider other actors and synergies with their programming, such as IRC's economic recovery programming.

**3. Domestic water efficiency awareness raising programme:** Support the establishment of a water efficiency awareness program for residents, that includes women delivering home-to-home training on water use and conservation, leak detection and management, and the benefits of rainwater harvesting. Consider a partnership with BORDA. Outreach to the Ministry of Water and Irrigation to assess interest in partnerships or pilots. Outreach to UNHCR based on previous WaSH involvement and delivery of tanked water supply.

**4. Female renewable energy and energy efficiency technicians:** Develop a programme mirroring the plumber programme, whereby women are trained to install and maintain domestic renewable energy / PV panels, as well as advise on energy efficiency in the home. This can be aligned with the New Energy Strategy 2020-2030. Partners to approach include: Zain Jordan, Norwegian Refugee Council (responsible for a successful 2-year programme implementation of "Renewable Energy 4 Refugees"), Green Building Council Jordan, GGGI and Jordan Renewable Energy & Energy Efficiency Fund. Use the success of the recent and high profile [Jordan Energy Hackathon 2020](#).

**5. Waste services:** Partner with Azraq Municipality to develop solid waste collection services. Train youth and women to take up initial CfW opportunities. Outreach to the Federation of Canadian Municipalities, based on their former investment of JOB 90,000 in waste related grants in south Jordan.

**6. Azraq CfW DRR and Green Growth Taskforce:** establish a DRR and Green Growth Taskforce as part of a CfW programme to support the Municipality and the Azraq community with development of a Local DRM Plan, prioritising needs and actions. Consider gaining support from the Swiss Development Cooperation (already active in Azraq), Red Cross or the GGGI. Outreach to the Jordan National Centre for Security and Crisis Management (NCSCM) to advise of local plans and actions and check for synergies or the opportunity to develop pilots for national DRR demonstration.

### **3.2.2 Mid-term (7-18 months)**

**7. Secure licenses for home-based businesses:** support Azraq Municipality and residents with licensing and operating home-based businesses such as small-scale dairy production.

**8. Transfer green successes: build case studies on green innovation** and success stories to engage with industry, government and the community, as well as transfer working successes. E.g. hydroponic production and biodigesters from Zaatari Camp.

**9. Industry water efficiency programming:** outreach to the Royal Scientific Society and the National Energy and Research Centre who previously developed successful water efficiency programmes with payback periods targeting the food and beverage sector. Explore if pilots can be revived / adapted for Azraq. Outreach to Zarqa Chamber of Commerce, BORDA and EDAMA for potential partnership and pilot opportunities.

**10. Identify climate risk and green industry training needs:** consider outreach to the Ministry of Environment, Chambers of Commerce, Jordan Cooperatives Corporation, Vocational Training Centres, GGGI. Identify green industry vocations aligned with climate risk. Start planning for new vocations, apprenticeships, curriculums, etc.

**11. Build on entrepreneurialism and mentorships:** connect with EDAMA working with an industry membership of Micro, Small and Medium sized Businesses, and Large Industry. EDAMA traditionally runs industry roundtables and power breakfasts, but recently has initiated a women's focused programme with the WIRE partnership. Shamal Startup in Northern Jordan is EU funded and similarly runs an accelerator programme focused on the broader landscape of innovation and technology. This programme has seen 3,500 business ideas and 250 startups seeded, with 18 displaying high-potential and 9 exporting to Europe and US markets. Shamal Startup's next phase is operating over the course of 2019-2022 and will similarly supply small grants to kick start good ideas that show promise to commercialise.

**12. Circular economy services:** partner with Azraq Municipality and Zarqa Governorate to build a programme of solid waste and sanitation that includes implementation of the waste hierarchy and circular economy features. This requires waste management and material awareness campaigns (prevent, reduce, reuse, repair, repurpose, recycle, safe disposal), collection and facilities, composting organics, biodigester and biowaste to energy considerations, recycling streams and landfill management (including lining and energy extraction).

**13. Establish a Local DRR Plan:** base the Plan on the needs and priorities decided by the DRR and Green Growth Taskforce (see Recommendation #6) during foundational planning in Year 1. Plan needs to address and implement on a wide range of activities including: awareness campaigns, Early Warning Systems, construction of upstream water storages, revegetation of river banks, channels and wadis to dissipate water velocity during prolonged and heavy rains resulting in flash floods, future proofing and correct locating of housing (permanent and temporary models e.g. tents), greening space addition for micro climate control (reduction of heat waves, mitigating desertification impacts), rainwater harvesting for year-long access to fresh water assets. Partnerships are required for this recommendation for technical input as well as to remove financial and institutional barriers. Outreach to Ministry of Environment, Agriculture Credit Corporation, universities and National Agricultural Research Centres, Jordan Department of Meteorology, Jordan National Centre for Security and Crisis Management, and climate finance mechanisms (see below).

**14. Green innovation financial credit lines:** unlock credit through development of green innovation financial products. As financing DRR and green growth solutions is often a barrier, look to build new financial partnerships and offers such as concessional loans. Outreach to Agriculture Credit Corporation, GGGI, Cities and Village Development Bank (the latter is in the final stages of becoming an Accredited Entity – planned for in July 2020).

**15. Jordan DRR Hackathon 2021:** modelled on the success of Jordan Energy Hackathon 2020, work with partners to establish a similar program inclusive of women and youth. Outreach to existing sponsors, in addition to entrepreneurial organisations offering acceleration and mentoring / apprenticeships e.g. Shamal Startup, EDAMA and WIRE, Chambers of Commerce, Green Building Council, Green Industry Academy, JREEF, Ministry of Energy and Mineral Resources, Ministry of Labour, and other relevant agencies.

### **3.2.3 Long-term (1.5-5 years)**

**16. Climate mechanism funding for DRR:** Explore options of funding from existing climate mechanisms under readiness or preparedness programmes. This may include: Global Environment Facility, Green Climate Fund, NAMA Facility, Adaptation Fund or Climate Investment Funds. Azraq Municipality needs a robust and long-term Early Warning System for the most common and dangerous climate hazards such as flooding, flash flooding and drought. It may be useful to approach the GEF Operational Focal Point at Ministry of Planning and International Cooperation, or to work with Accredited Entities on the DRR and green growth agendas, such as Save the Children and UNIDO.

**17. Industrial Energy Efficiency and RE:** Support Azraq's businesses to transition to an energy efficient pathway and increase the share of renewable energy. Support to uptake of renewable and solar programming through partnerships. Outreach to JREEF based on a previous provision of energy audits and services targeting 30 business. Also promote the existing Ministry of Energy and Mineral Resources LED programme, whereby incandescent lights are taken-back and exchanged with up to five new free LEDs. Build on the NRC's RE4R programme through promotion and partnerships.

**18. Advocate for Disaster insurance:** calamity and catastrophe insurance schemes are today becoming normalised, especially for countries and regions experiencing extreme climate events. Such events are not going away, however, the loss and damage generated by these events can be better managed with DRR plans and partnerships in place, which should include customised insurance plans. DRR insurance can include household, business, industry and central government coverage plans. DRR insurance schemes need to be advocated for and adopted. Such schemes ensure that assets and livelihoods are costed-in sufficiently to avoid debt and regression on socio-economic achievements. Furthermore, insurance schemes for disaster coverage complement DRR policy and on the ground programming. This requires a wider conversation with many actors, Azraq Municipality may be positioned through this dialogue, to pilot such a scheme.



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