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Disaster Risk Reduction for
Resilience and Sustainable
Development in the Arab
Region

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UNEP United Nations Environment Programme

UNHABITAT United Nations Human Settlements Programme

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1. Introduction

Increased shocks and stresses due to manmade events and disaster losses, corresponding to both rare and frequent hazard events continue to hinder the development process and threaten development gains in the Arab world. For example, according to the Arab Strategy for Disaster Risk Reduction 2020, over the last twenty five years the region faced 276 disaster events, killing nearly 100,000 affecting 10 million and rendering nearly 1.5 million homeless; without even accounting for economic losses and conflict related fatalities, injured, displaced and other affected population segments. Indeed as Figure 1 shows, reported disasters are continuing to increase due to both improved reporting and increased exposure and vulnerabilities. In the figure below, and other figures in this document, the values for 2010-2019 are obtained by doubling the values for 2010-2014, in order to be able to compare identical periods (i.e. one decade). However, it should be recognized that there are major gaps in data loss collation at the national level, where data is collated for compensation purposes rather than for informing the science-policy interface.

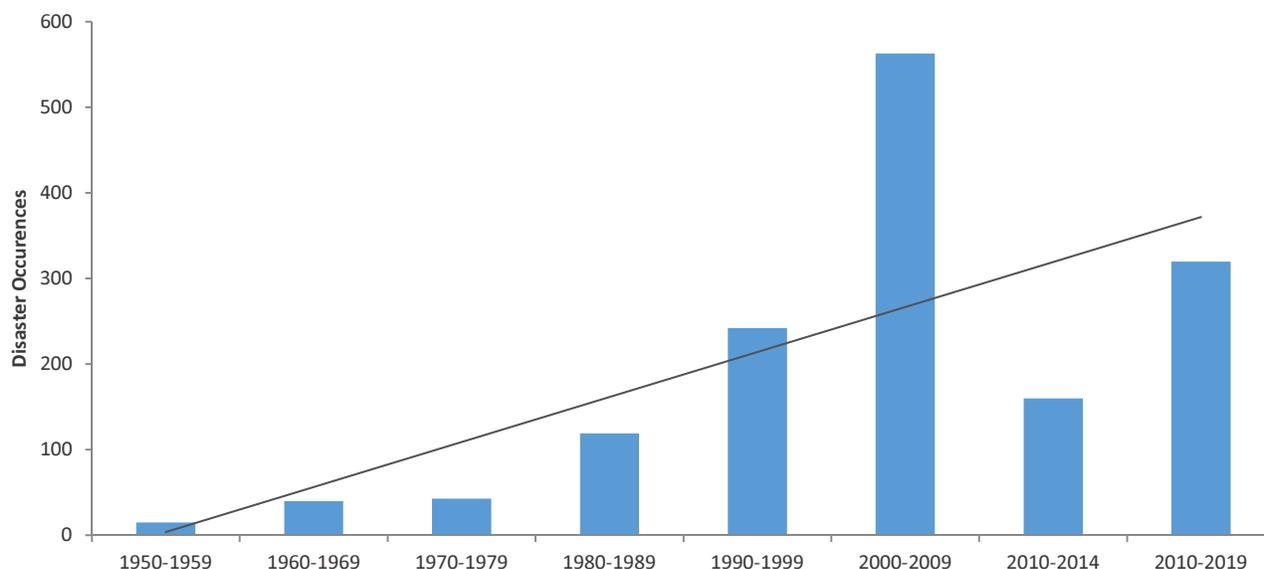


FIGURE 1 DISASTERS TEMPORAL TREND (SOURCE: EM-DAT STATISTICS 1951-2005)

In many Arab cities, there are indications that extensive risk (corresponding to high frequency and low severity hazardous events such as yearly floods and storms) is increasingly affecting the infrastructure in poor neighborhoods and slums, in both rural and urban areas, keeping it highly vulnerable to intensive risk (corresponding to low frequency and high severity hazardous events) such as earthquakes and tsunamis. Conflict, more recently, is increasingly present in several countries, which together with the associated influx of displaced people, is disproportionately affecting poorer neighborhoods and slums, including public sector infrastructure in poor areas used exclusive by the poor and by low income households, all of which are already weakened due to extensive risk, thereby further accentuating the vulnerability of these areas and the people living within them to intensive risk. Even drought events are clearly increasing, which is usually more difficult to measure as a single event since it is a slowly unfolding process.

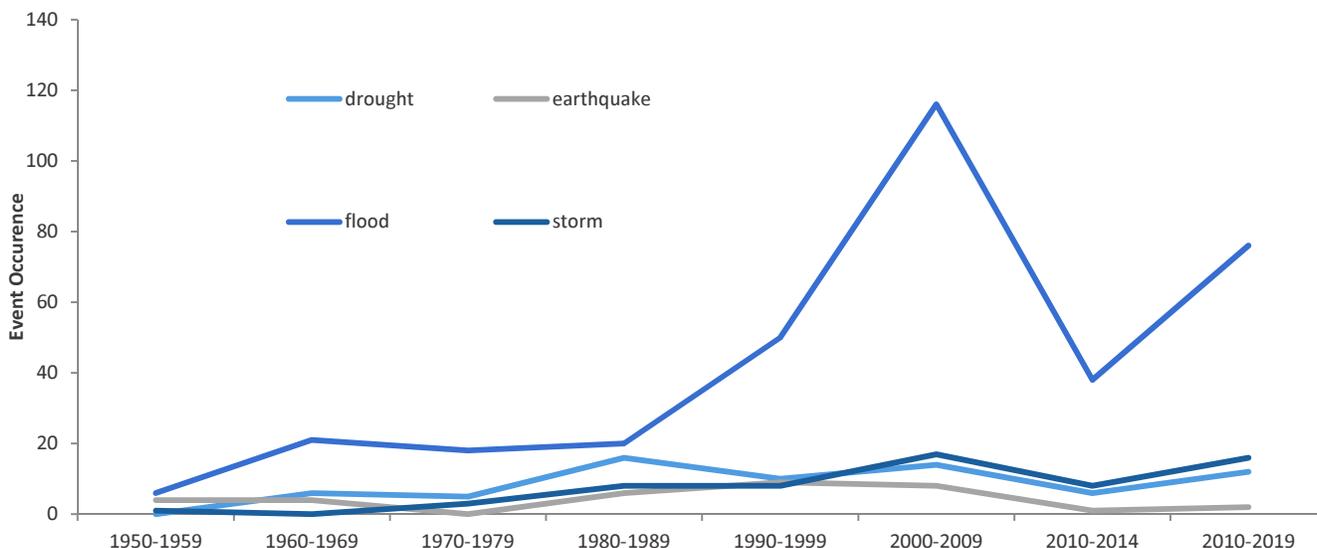


FIGURE 2 DISASTER TYPE TEMPORAL TREND (SOURCE: EM-DAT STATISTICS 1951-2005)

In rural areas, drought and climate change is impoverishing the livelihoods of many who rely on agriculture crops and cattle for their livelihoods, leading them to abandon their homes and move to urban slums in search of alternative sources of income, thereby increasing pressure on infrastructure in these slums and the number of exposed and vulnerable populations to both intensive and extensive risks.

The above disaster trends are hindering development efforts in the region, which continue to show large inequalities in income levels, and corresponding development indices, both within and in-between countries, as evidenced from a succinct review of overall and inequality adjusted human development indices.

Arab Development and Economy Category	Human Development Index (HDI)	Inequality Adjusted Human Development Index (IHDI)
GCC	0.816	Not available
Mashreq	0.685	0.54025
Maghreb	0.672	0.415
ALDC	0.4426	0.3003

There has been various attempts to address challenges related to development, climate change and disaster risk losses including the Millennium Development Goals (MDG), Hyogo Framework for Action (HFA) and Climate Change Adaptation (CCA) international initiatives. Notwithstanding the important strides made by some Arab states in the implementation of the above initiatives, a recent review of the progress of Arab states in implementing the Hyogo Framework for Action¹ concluded that the possibility of effecting change in DRR and resilience is significantly increased if a holistic approach is adopted which a.) promotes supporting initiatives across priority areas, b.) creates new and strengthens existing linkages with development initiatives, and c.) addresses governance challenges. Similar conclusions were reached upon the review of the progress of Arab states in implementing various international initiatives including the Convention on the Rights of the Child (CRC) and the MDGs². Against the above background, it becomes increasingly important to identify

opportunities and challenges in integrating DRR and resilience building into development plans to achieve sustainable development growth.

2. Main trends and challenges in DRR and resilience building

A recent review of disaster risk reduction efforts in the Arab region identified the following main trends and challenges in DRR practices:

- 1) Importance of creating linkages with development initiatives is recognized, albeit not necessarily translated into action plans
- 2) There is a lack of sufficient investment in corrective DRR strategies (to reduce existing risk), as opposed to ongoing efforts directed at response and in smaller instances at prospective strategies (to prevent risk from accumulating in the future), as evidenced by the lack of use of cost benefit analysis (CBA) which would justify investment in corrective strategies for the most vulnerable communities,
- 3) There is a lack of sufficient investment in addressing extensive “everyday” risks, as evidenced by limited development and use of disaster loss databases, which would provide data on both extensive and intensive disaster losses, in the development decision making process,
- 4) Lack of sufficient linkages between efforts for investing in DRR for intensive risk on the one hand and everyday needs of vulnerable communities and households, where gender considerations and recovery plans to build back better (livelihoods and infrastructure) are not given sufficient importance,
- 5) Lack of sufficient investment in the social safety nets and temporary employment schemes that reduce vulnerability thereby increasing resilience, and
- 6) Higher degree of awareness on the importance of investing in DRR and linkages with development and investments.

Infrastructure

Infrastructure is being increasingly weakened by 1) increased extensive risk damages corresponding to climate-related events as shown in the figure to the right, 2) increased damage to infrastructure due to conflict in several Arab countries (including Iraq, Lebanon, Libya Syria, Somalia and Yemen amongst others), and 3) increased demand on infrastructure due to both increases in population at the regional level and increases in demand due to war-induced displacement patterns (e.g. as is happening in Egypt, Jordan and Lebanon due to the Iraqi, Libyan and Syrian crises).

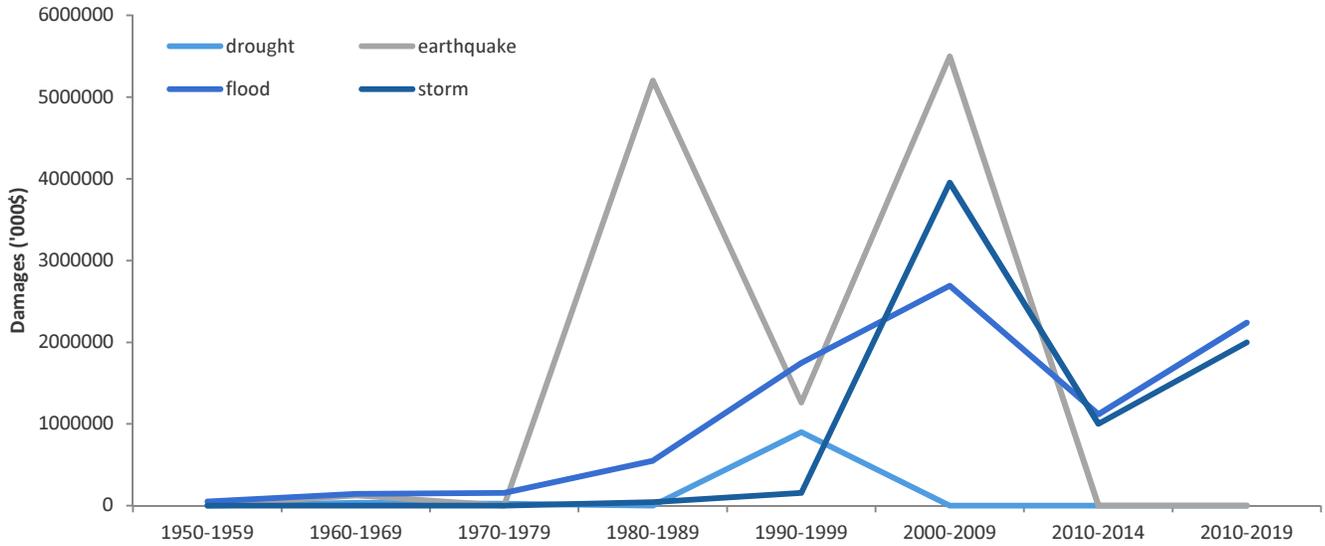


FIGURE 3 TEMPORAL TRENDS IN DAMAGES PER DISASTER TYPE (SOURCE: EM-DAT 1910-2014)

Furthermore, the figure below demonstrates that in most countries, especially in Arab least developed countries (Comoros, Djibouti, Mauritania, Somalia and Yemen), extensive everyday risks related to climate continue to inflict the largest degree of damages on infrastructure, housing and livelihoods.

On the other hand, main trends related to building resilience of infrastructure can be summarized as follows: **1)** most sectoral investment strategies do not account for DRR consideration, **2)** minimal efforts are directed towards the assessment of schools and hospitals against disasters **3)** limited sectoral investments are directed towards incorporating DRR in the retrofitting of schools and hospitals, **4)** limited accounting for the impact of major infrastructure investments on disaster risk and **5)** limited or conflicting reports on accounting for costs and benefits of disaster risk reduction in major infrastructure investments.

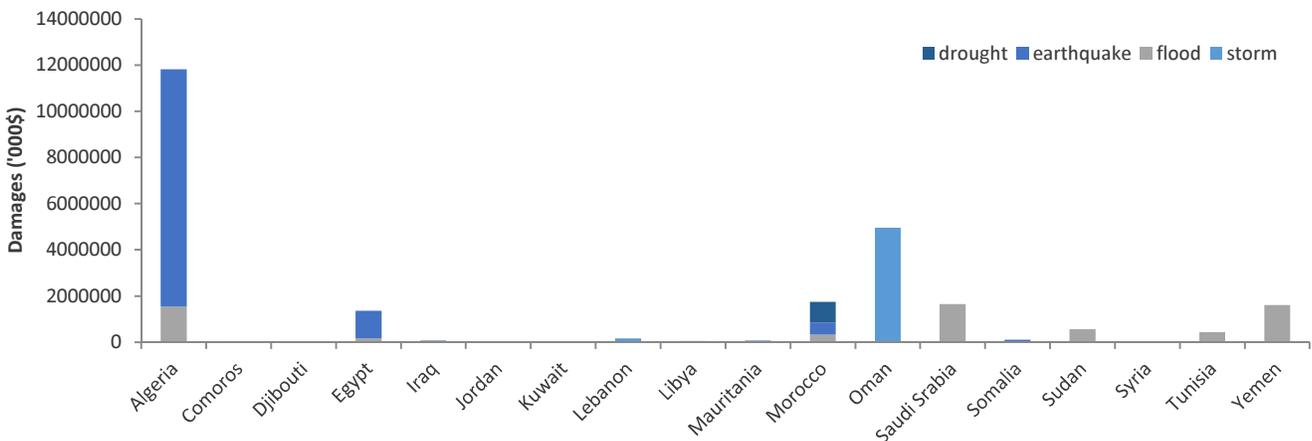


FIGURE 4 COUNTRY TEMPORAL TRENDS IN DAMAGES PER DISASTER TYPE (SOURCE: EM-DAT 1910-2014)

Human settlements

Urban population, as a percentage of total population, registers very high values for many countries in the region (e.g. it reaches 79, 88 and 90% in Saudi Arabia, Libya and Lebanon respectively). Furthermore, slum to urban ratios registers at 40, 50, 57, 86, 92 and 94 % in Egypt, Iraq, Lebanon, Sudan, Mauritania and Somalia respectively. In some cases countries don't have any data pertaining to urban statistics (UN-HABITAT and World Bank). High urban population ratios, coupled with high slum to urban ratios leave large swaths of urban populations highly exposed to extensive disaster risk, due mainly to climate related hazards (floods and hazards) expected to continue to increase due to climate change, particularly drought (see figures below). In addition, disaster loss collation practices in the region collate losses with a view to compensate eligible affected people, while residents of informal settlements and slums are considered ineligible for compensation and as such disaster losses in these regions are often left un-collated. Finally, urban population both those in slums are outside it, are exposed to earthquake hazards albeit with varying degrees of vulnerability, especially that in most cities a large percentage of buildings are more than 50 years old, while building codes start accounting for earthquakes in the last ten to fifteen years in most cases.

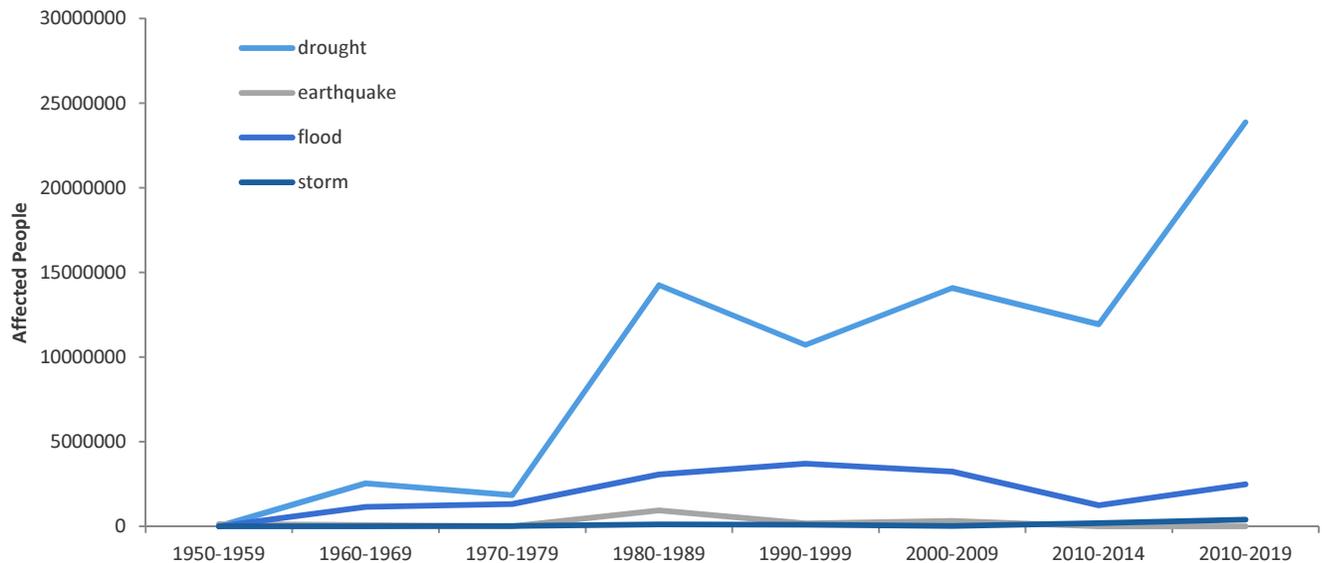


FIGURE 5 TEMPORAL TRENDS IN AFFECTED PEOPLE PER DISASTER TYPE (SOURCE: EM-DAT 1910-2014)

Against the above background, main trends and challenges in DRR practices related to human settlements in the Arab region can be summarized as follows: **1)** Limited investment in urban risk reduction practices including enforcement of codes except for Maghreb countries, **2)** investment in drainage infrastructure is limited, bearing in mind that in most countries it corresponds more to extensive as well as intensive risk **3)** Minimal efforts for securing land and housing to low income households, **4)** limited provision of land titling.

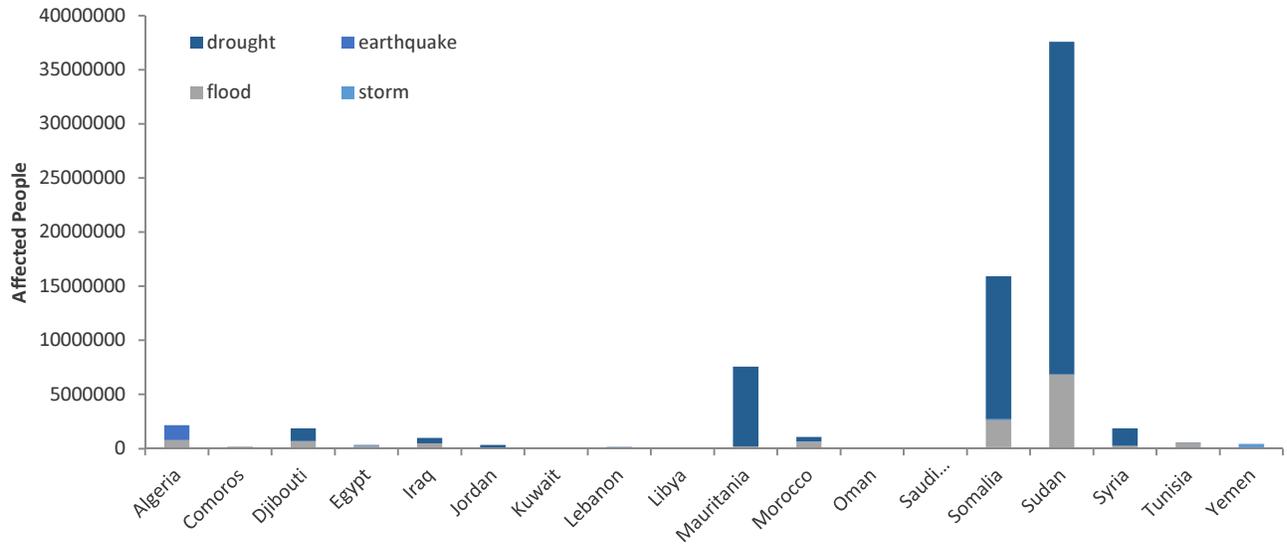


FIGURE 6 COUNTRY TEMPORAL TRENDS IN AFFECTED PEOPLE PER DISASTER TYPE (SOURCE: EM-DAT 1910-2014)

Climate change

According to the Arab Centre for the Study of Arid and Dry land (AC-SAD), drought is affecting large parts of many Arab states and is expected to continue to do so for the foreseeable future. In addition, the combined climate related events (i.e. flood, storm and drought) constitute the largest percentage of hazard affecting Arab countries.

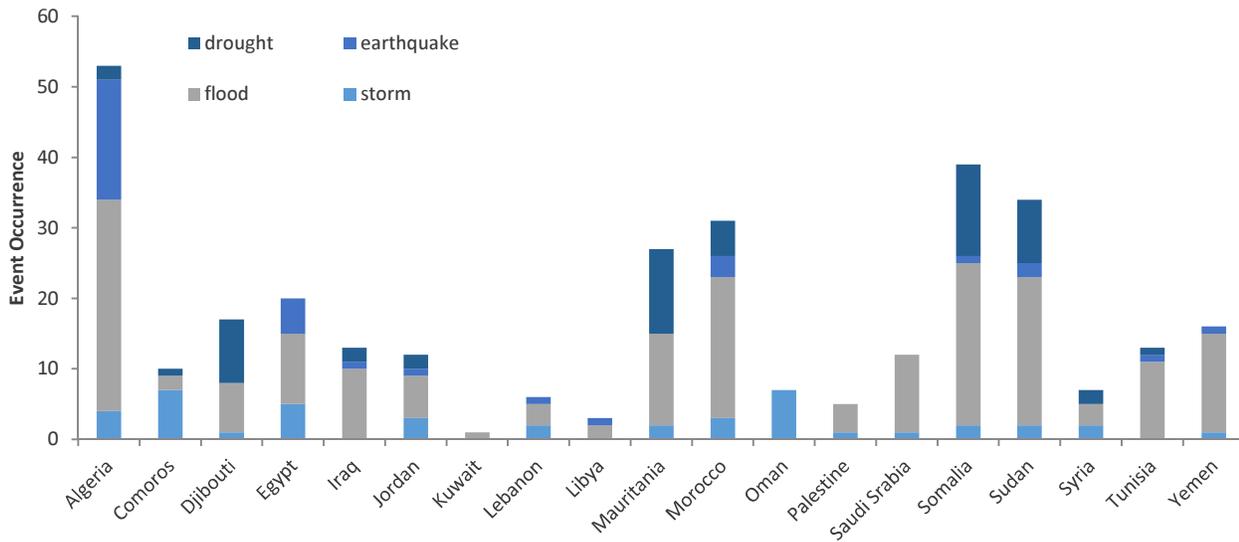


FIGURE 7 COUNTRY DISTRIBUTION OF EVENTS PER DISASTER TYPE (SOURCE: EM-DAT 1910-2014)

Current trends in dealing with climate change and DRR may be summarized as follows: **1)** limited integration of DRR in CC strategies, for some of the regions and countries most affected by it, **2)** Good integration of DRR into CCA/UNDAF strategies, **3)** Except for Maghreb countries, DRR is not considered an integral objective of environmental policies and plans including EIAs and CCA, **4)** Except for Maghreb countries and excluding micro-insurance, very limited measures are taken to reduce social vulnerability to climate change, **5)** Except for Mashreq countries, climate change considerations are not sufficiently accounted for in preparedness for potential risk scenarios.

Cross cutting considerations

Cross cutting issues affecting DRR and resilience include governance, inclusiveness, decentralization and legislation where the following trends may be observed: **1)** minimal representation of independent gender organizations within national platforms for DRR, **2)** minimal adoption of gender disaggregated capacity vulnerability and needs assessment to inform the risk assessment process, **3)** Wide variations in reports on local legislation for DRR, where even for those countries reporting a yes legislation is often developed but not enacted and/or resources not sufficiently allocated **4)** poor investment in DRR as an area for research within national budgets, where even when investments are allocated for DRR the results do not inform the decision making process, **5)** minimal accounting for gender considerations in contingency plans, where even those regions reporting positively on this indicator neither have gender representation nor indeed carryout gender disaggregated vulnerability, needs and capacity assessments and **6)** moderate accounting for differential vulnerabilities, needs and capacities of the elderly and the disabled in contingency plans, where countries reporting for the first time tend to exaggerate performance results. This is reflected in various indicators on weak governance as shown in the tables below where results vary on a scale from -2.5 (weak) to +2.5 (strong). Clearly effecting change in DRR, MDGs, HFA, CCA and CRC requires addressing the governance related challenges affecting all Arab countries as seen in the table below.

	Voice & Accountability	Political Stability & No Violence	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
ALDC	-1.38166	-1.49	-1.414	-1.42166	-1.268333	-1.00667
GCC	-1.08	0.191667	0.47333	0.44667	0.51166	0.43667
Maghreb	-0.57	-0.8433	-0.2033	-0.53	-0.3733	-0.37667
Mashreq	-0.962	-1.654	-0.696	-0.654	-0.686	0.754

Regarding preparedness effort for response, the following trends may be observed: **1)** resources and efforts are directed at response plans much more than at prevention and mitigation, **2)** response plans exist in most countries; however these plans rarely account for differential vulnerabilities, needs and capacities of different population groups according to age, sex, social and economic backgrounds and presence of special needs, **3)** there are limited plans in existence for improving the resilience of infrastructure in times of crises, as evidenced by events in Lebanon, Jordan and Iraq where the infrastructure has been subjected to a severe shock due to the increased demand as a result of flow of millions of Syrian and Iraqi refugees, **4)** recovery is understood as part of response as evidenced by a lack of any recovery plans to “build back better” both infrastructure and livelihoods.

3. Analysis of Proposed SDGs and Targets from an Arab Perspective

Infrastructure

Comments are provided below for each OWG target and corresponding indicators:

- **OWG 9.1:** additional targets are required, where especially for weather related risks these should be segregated according to type of risk (intensive vs. extensive) and type of human settlement (rural vs. urban vs. slum-urban).
- **OWG 9.2:** additional targets are required, where the term “sustainable” should be explicitly linked to resilience against intensive and extensive risks in order to protect poverty reduction and unemployment gains against natural hazards. A related indicator is the use of CBA for DRR in investment decisions for the industrial sector. Another indicator is for governments to put in place mechanisms for tracking DRR investments in the industrial sector.
- **OWG 9.3:** additional targets are required, to ensure small scale industrial MSEs and SMEs can benefit from micro-finance and micro-insurance initiatives at affordable prices and reasonable terms and conditions. Also important is an indicator showing distribution of losses in the industrial sector divided between MSEs, SMEs and large enterprises, due to intensive and extensive losses.
- **OWG 9.4:** additional targets are required to ensure that the term sustainable is explicitly related to resilience against natural hazards. Hence example indicators include upgrading industry and retrofitting infrastructure against both intensive and extensive risk for different enterprise sizes. Another possible indicator is putting in place mechanisms for monitoring risk (and benefits) transfer practices from the builder of the industrial facilities through the operator and to the user / consumer, and including the regulator and other relevant stakeholders.
- **OWG 9.5:** additional targets are required to ensure funds are allocated and tracked for carrying out research for analyzing losses in the industrial sector corresponding to both intensive and extensive risks for various enterprise sizes, CBA and DRR analysis, tools for identifying and tracking risk transfer mechanisms, amongst others.
- **OWG 9.a:** as recommendations from 9.1 to 9.4, where applicable, with special emphasis on coastal developments for SIDS.
- **OWG 9.b:** as recommendations in 9.5, with special emphasis on coastal vulnerabilities and resilience tools for SIDS.
- **OWG 9.c:** additional target are required, to ensure ICT infrastructure resilient against hazards, and is available in vulnerable communities to SMEs and MSEs in poor rural and urban areas.

Human settlements

Comments are provided below for each OWG target and corresponding indicators:

- **OWG 11.1:** there is a need to address both intensive (extreme) risks and extensive (everyday) risks. At the moment it seems indicators are focused more on intensive risks, even though extensive risks significantly affect slums infrastructure, and the lives and livelihoods of people living within them leaving them disproportionately vulnerable and exposed to intensive risks. An additional indicator is that housing and infrastructure must be made resilient against both intensive and extensive risks, and associated **technological risks**.

- **OWG 11.2:** there is a need to measure whether the needs (and capacities) of vulnerable communities and persons (elderly, special-needs, etc) have been assessed in a participatory, gender dis-aggregated manner that accounts for differential needs, capacities and vulnerabilities across sex, age, religion, ethnicity, ability and social and economic backgrounds.
- **OWG 11.3:** there is a need to develop indicators to ensure that strategies are being transformed into policies at the national sectorial and city levels, with detailed implementation decrees, and that sufficient resources (financial and human) are being allocated for their implementation.
- **OWG 11.4:** protection of cultural and heritage sites must include intensive risks, **technological** risks and climate change risks (e.g. rising sea levels and excessive rains leading to new patterns in slope stability and flooding, amongst other phenomena).
- **OWG 11.5:** losses should be segregated for type of risk (intensive and extensive). While extensive risks do not produce deaths in developed industrialized countries, this is not necessarily the case in developing countries. Furthermore, economic losses and losses to livelihoods should be segregated according to sector and type of risk as well as rural vs. urban areas and gender considerations (in the broadest Gender sense of differential vulnerability, need and capacity according to age, sex, ability, ethnicity, religion and social and economic backgrounds). There is a need to develop indicators showing risk transfer mechanisms and associated inequality in the distribution of risks and benefits from various activities in both rural and urban areas. Regarding losses, there is a need to add losses due to unequal development (i.e. the difference between the HDI and the IHDI) to disaster losses while capturing the aggregate unequal distribution for all.
- **OWG 11.6:** reducing per capita emissions in cities is important. However, in addition to this indicator, there is a need to capture the unequal distribution of benefits from activities producing these emissions and the unequal distribution of exposure and vulnerabilities associated with them.
- **OWG 11.7:** there is a need to ensure that this is grounded in a participatory, gender dis-aggregated capacity, needs and vulnerability assessment that capture variations according to sex, age, ability, ethnicity, religion and social and economic backgrounds.
- **OWG 11.a:** in many instances, especially in developing countries, the challenge is not the planning but the implementation. Hence this must be reflected in any indicators.
- **OWG 11.b:** indicators must include success in reducing excessive inequalities of benefits and risks corresponding to various economic activities, and the associated indicator of cities capable of addressing “excessively unequal” risk transfer mechanisms
- **OWG 11.c:** indicators must measure the success in linking the “local material” initiatives to a more holistic approach that links to social and economic factors contributing to vulnerability.

Climate change

A general comment is that it may be confusing to combine climate change with other hazards. There may be a need to allocate the necessary attention to each separately before adopting a holistic approach to ensure resilience. Comments are provided below for each OWG target and corresponding indicators, as follows:

- **OWG 13.1:** Collation of losses should be carried out in a sectoral manner (e.g. for industrial as shown above), even if then collated with climate change losses for all sectors. This is particularly true as sectoral agencies should also be carrying out CBA analysis to be informed by and grounded on disaster losses. Furthermore, losses should be dis-aggregated according to extensive and intensive risks, in rural

and urban areas, an issue not sufficiently addressed in the current indicator list. Similarly, public expenditure as a function of GDP or GNP is not sufficient to give an accurate picture of investment in DRR. Rather, and as discussed for OWG 9, there is a need to develop and adopt mechanisms for allocating and tracking of investments in DRR and in risk transfer mechanisms showing distribution of benefits and risks across different sectors, stakeholders and enterprise sizes. This target and corresponding indicators is in need of a thorough revision.

- **OWG 13.2:** there is a need to develop indicators to measure resilience of agriculture and tourism sectors to climate changes (including in SDIS). In addition there is a need to measure the protection of jobs and livelihoods in the agriculture sector against CC risks. In addition, linking to OWG 11, there is a need to measure effect of CCA policies on reducing movement from rural areas to urban slums.
- **OWG 13.3:** there is a need to explicitly relate awareness raising strategies to a gender disaggregated vulnerability, capacity and needs assessment of vulnerable communities, to avoid programs and tools developed in industrialized countries being replicated in ALDC countries, amongst others, without sufficient contextualization. There is a need to explicitly related awareness raising strategies to the economic, social, institutional, natural and physical factors contributing to vulnerability. In OWG 13, as in other OWGs, there is a need to raise awareness on risk governance challenges which lead to an unequal access to power related to the decision making process affecting CCA and DRR and which in turn leads to an unequal distribution of benefits and risks arising from various economic activities on the use, production and distribution of resources.
- **OWG 13.a:** There is a need to ensure that these funds will not mainly be allocated to institutional building, capacity building and awareness-raising as revisions from various international initiatives (including the CRC, MDG and HFA) show that progress in governance and disaster risk governance is fundamental to effect change in DRR and CCA and therefore contribute to sustainable development. Furthermore, there is a need to ensure that funds will be directed at risk and vulnerability assessments, in a matter proportional to linkages with the decision making process.
- **OWG 13.b:** capacity building should be based on a gender dis-aggregated capacity, vulnerability and needs assessment contextualized to the vulnerable communities and sectors under consideration. Furthermore, it is useful to reiterate that capacity building not coupled with efforts to effect change in governance and risk governance practices will not be successful in effecting change in DRM and CCA practices, which in turn when successful can lead to major strides in sustainable development.

Other issues

Regarding OWG 10, there is a need to reduce inequality in the distribution of benefits and risks (and corresponding losses) arising from the various economic activities related to the use, production and distribution of resources (including mineral, land, and water and air resources). Hence there is a need to measure 1) degree of unequal distribution of benefits, 2) degree of unequal distribution in exposure, 3) degree of unequal distribution in vulnerabilities, 4) degree of unequal distribution in capacities (due partly to use of resources in policies for education and research), 5) degree of unequal distribution in risks, 6) degree of unequal distribution in losses, 7) targets and measures to reduce and monitor the inequality in the distribution of the above parameters while accounting for differences according to sex (male / female), age (children, youth, adults, elderly), ability (special needs), ethnicity, religion, and social and economic backgrounds.

4. Major Success Stories on disaster risk reduction for resilience and sustainable development

Integrated Land Use Management

The city of Aqaba, Jordan is known for being vulnerable to the hazards of earthquakes and flash floods. To reduce vulnerability and minimize the risk as well as make the city as resilient city to such hazards, Aqaba Special Economic Zone Authority (ASEZA) and the local government have taken major steps in DRR by mainstreaming risk sensitive land use planning in its formal land use process. The outcome of such practice has been risk sensitive land use and development plans that are used by ASEZA as tool for decision making and strategic planning.

National Strategy for Disaster Risk Management

A National Strategy for Disaster Risk Management was developed to improve DRM practices along three axes: 1) effectiveness and governance of risk management practices at all levels, 2) critical infrastructure resilience and 3) city and community resilience. The NSDRML recognizes the acute risk accumulation concentrated within various geographical locations and sectors so it proposes corrective plans and measures to reduce this existing risk on the most vulnerable sectors, communities and households; these include the nursery, education, health, industrial, primary response, oil and gas, and the housing sector.

Algeria Best Practices

The eradication of poor housing is an important action to improve the lives of thousands of families and through the implementation of new housing. As such, Algeria completed more than 46000 units in 2013 and a forecasted 52000 units in 2014 as part of a specific program dedicated to the eradication of poor habitat. The total budget dedicated to the eradication of 379000 poor housing, located in 12355 sites in 1300 municipalities, amounts to nearly \$ 15 billion. In addition, a budget of nearly \$ 1 billion has been reserved for governorates to rehabilitate housing and increase their resilience.

To reduce the risk due to high exposure, the government pursued efforts to establish populations in rural areas by planning and implementing major rural housing programs. In 2013, it completed nearly 153000 rural housing (\$ 1.5 billion) and is expected to achieve approximately 276000 rural housing in 2014 (\$ 2.9 billion).

Resisting the risks of floods

Yemen is continuously exposed to the risk of floods, seasonal or catastrophic caused by climate change. The flood caused approximately US\$ 1.7 billion in total damages and losses, and estimated to have increased the poverty rate from 28 to 51%. Therefore, Khor-Al Mukalla was created to reduce the vulnerability of coastal cities to the risks of floods. Residues from the stream valley, and in the town center, were removed and a channel (3 meters deep, 1.6 kilometers long and 50 meters wide) was excavated, and opened to the sea. The local authority adopted a strategic plan to implement this project, which significantly reduced the vulnerability of the city to flooding hazards and contributed to the high rates of tourism and investment in the region.

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6. Footnotes

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