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SOCIO- ENVIRONMENTAL IMPACTS OF URBAN EXPANSION: CASE OF ARAB COUNTRIES

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Abstract: *Problem statement: Most Arab countries currently experience urban population growth at high rates, whereby over half the population lives in towns and cities, a trend which, in some cases, reaches more than 90%. Urbanization in the Arab world has been fuelled by high fertility rates, substantial rural-urban migration, international labor migration and the concentration of economic activity in urban areas. Moreover, urbanization mixed with the high fertility rates and the large percentage of youth in the Arab world will continue to put pressure on federal governments to address the socio-economic problems. This paper assesses the direct effects of urban expansion on environment and society in Arab World.*

Approach: *This paper uses information about demographic changes and hydrologic data in the Arab World for the last years. The goal is to understand the connection between urbanization, water quality pollution and biodiversity in this Region. Official reports from governments, United Nations, World Bank and Economic and Social Commission for Western Asia (UN-ESCWA) are used.*

Results: *Results indicate that there has been notable urban growth, lack of access to improved water sources, pollution and a loss of biodiversity as new urban developments have appeared in these areas. The population increase in a volcanically active area is particularly troubling since it poses a potential human health risk.*

Conclusion/Recommendations: *The review also shows a direct correlation between urbanization with the reduction of water quality, air pollution and loss in biological diversity regarding species and ecosystems.*

Keywords: *Population growth, urbanization, urban growth, environmental impacts, water quality, pollution, biodiversity.*

INTRODUCTION

Urbanization and mass immigration to the city first took place during the Industrial Revolution and the beginning of capitalism in the late 18th century and early 19th century. Peasants were usually forced off their land and obliged to move to urban areas to find work in factories, creating horrible socio-economic conditions in the

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city centers and overcrowding. Today, urbanization is a worldwide phenomenon that has grown dramatically since the 1970's and 1980's.

Between 2011 and 2050, the world community is anticipated to progress by 2.3 billion, crossing from 7.0 billion to 9.3 billion (United Nations, 2011). At the same time, the population living in urban areas is projected to gain 2.6 billion, moving from 3.6 billion in 2011 to 6.3 billion 2050. Thus, the urban areas of the planet are expected to consume all the population growth anticipated over the next four decades though at the same time forming in some of the rural population. As a consequence, the world rural population is projected to start declining in about a decade, and there will possibly be 0.3 billion fewer rural inhabitants in 2050 than today. Furthermore, most of the population growth required in urban areas will be concentrated in the cities and towns of the less developed regions. Asia, in particular, is predicted to see its urban community rise by 1.4 billion, Africa by 0.9 billion, and Latin America and the Caribbean over 0.2 billion. Population growth is, therefore, becoming mostly an urban phenomenon concentrated in the developing world (David Satterthwaite, 2007).

The advanced countries of the world are well ahead of the curve, with 75% of their population living in cities and an estimated 83% by the year 2030. In the coming decades, the greatest growth in urban population is expected to occur in the developing countries where Arab World is a part of (Figure 1)

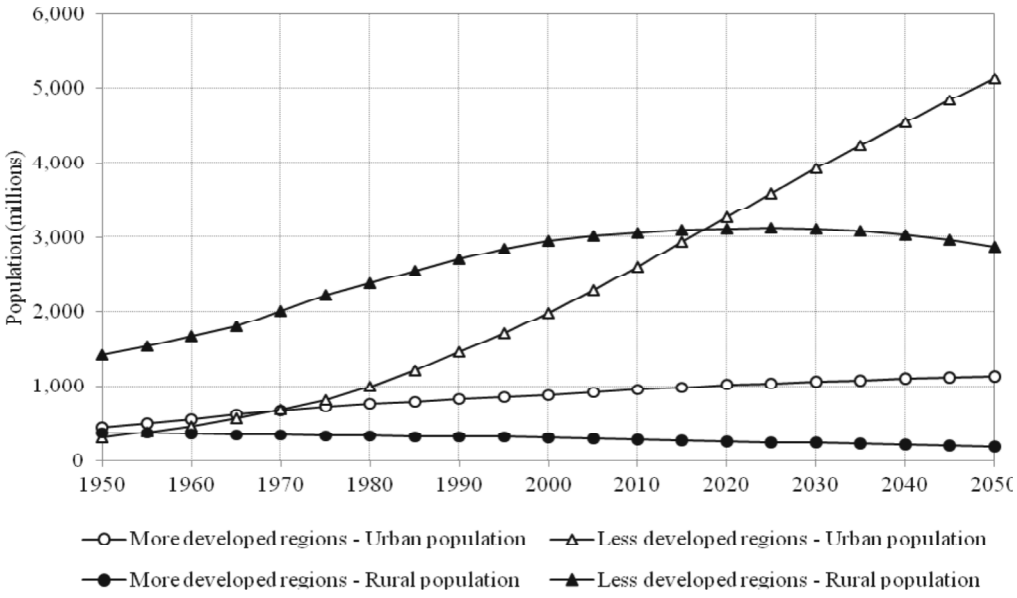

Figure 1

Source: United Nations Department of Economic and Social Affairs/Population Division World Urbanization Prospects: The 2011 Revision

The rate of increase of the world urban society is slowing down (table 1). Between 1950 and 2011, the world urban population grew at an average rate of 2.6 percent per year and developed nearly fivefold over the period, moving from 0.75 billion to 3.6 billion. While 2011-2030, the world urban population is forecasted to grow at an average annual rate of 1.7 percent, which, if sustained, would lead to a doubling of the urban population in 41 years. During 2030-2050, the urban growth rate is anticipated to decline further to 1.1 per cent per annum, implying a doubling time of 63 years.

Table 1
Total Urban and Rural Population by Development Group, Selected Periods, 1950-2050

	Population (billion)					*Average annual rate of change (%)*			
Development Group	*1950*	*1970*	*2011*	*2030*	*2050*	*1950-1970*	*1970-2011*	*2011-2030*	*2030-2050*
Total population									
World	2.53	3.70	6.97	8.32	9.31	1.89	1.55	0.93	0.56
More developed regions	0.81	1.01	1.24	1.30	1.31	1.08	0.51	0.23	0.06
Less developed regions	1.72	2.69	5.73	7.03	7.99	2.23	1.85	1.07	0.65
Urban Population									
World	0.75	1.35	3.63	4.98	6.25	2.98	2.41	1.66	1.13
More developed regions	0.44	0.67	0.96	1.06	1.13	2.09	0.89	0.52	0.29
Less developed regions	0.30	0.68	2.67	3.92	5.12	4.04	3.33	2.02	1.34
Rural population									
World	1.79	2.34	3.34	3.34	3.05	1.36	0.87	-0.01	-0.44
More developed regions	0.37	0.34	0.28	0.23	0.18	-0.48	-0.48	-0.92	-1.14
Less developed regions	1.42	2.01	3.07	3.11	2.87	1.74	1.03	0.07	-0.40

Source: United Nations Department of Economic and Social Affairs/Population Division World Urbanization Prospects: The 2011 Revision

The population of the Arab section is around 320 million people, living in 22 countries extending from Morocco and Algeria to the westward to Yemen and Oman in the east (Figure 2).

The region is marked by a broad diversity, not just in political, ethnic, social, cultural, and economic terms, but also in courses of the progress that individual states have made regarding development. Regarding sub-regional divisions, we consider four main groupings, bearing in mind that some LDC group members also tend to belong to the different group: Arab Least Developed Countries (LDCs), the Mashreq and the Maghreb countries, and the Gulf Cooperation Council (GCC). Taken together, the Arab nations offer examples of conflict and post-conflict situations; range from very open economies to economic isolation, and display highly urbanized to predominantly rural populations. Urbanization in the Arab

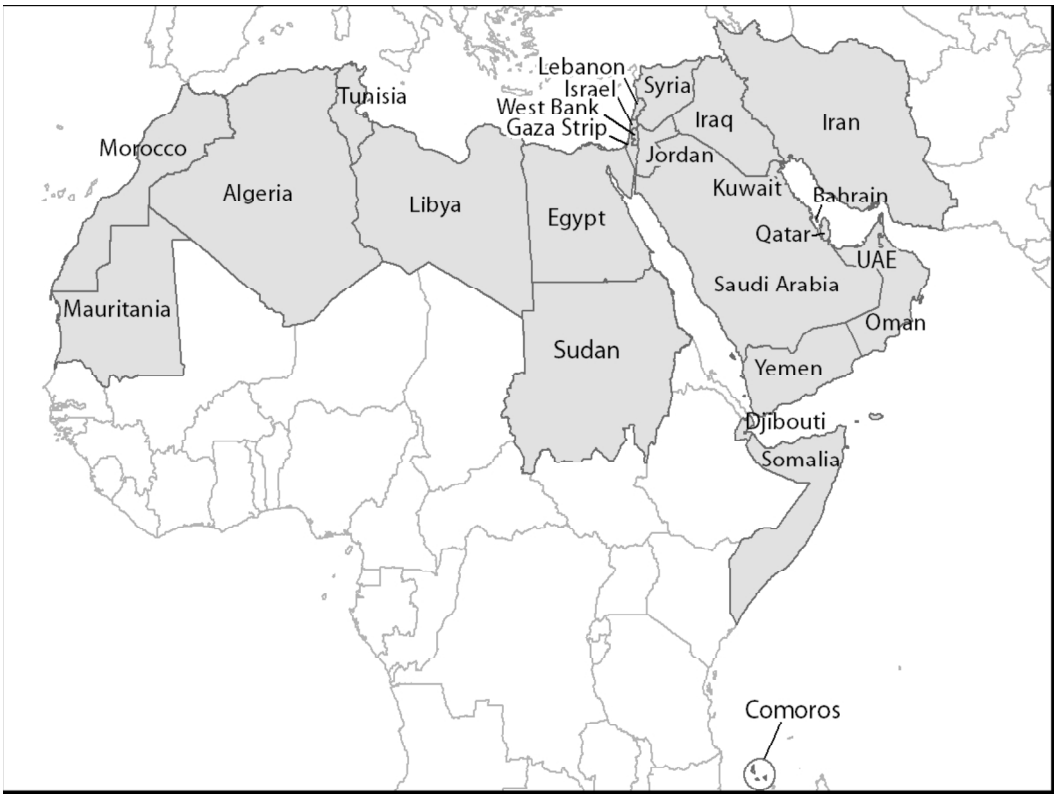

Figure 2: The Arab Countries Map

region has been fuelled by high fertility rates, substantial rural-urban migration, international labor migration and the concentration of economic activity in urban areas. Housing policies have also contributed to urban growth.

Infrastructure expansion has not kept pace with this growth (UNFPA, 1996). Rural development activities often designed to counter urbanization trends have earned low priority policy concentration. The countries in the GCC have some of the world's greatest rates of labor immigration. Migrants are concentrated in the Gulf cities, providing to this subregion's high urbanization levels. Over the last few decades, infrastructure developments in the Arab region brought drinking water to 82 percent of the population, and hygiene to most of those earning in urban areas. However, progress decreased in the 1990s, and some countries have reversed. Since 1990, the percentage of people living under $1 per day has not developed, and the percentage living below $2 per day has progressed from 21 to 23 percent of the population. According to World Bank estimates, considering the income poverty line $1/day per person does not indicate reality in the Arab region: some countries, namely in the GCC, are classified as high wages while many of those in the Mashreq and Maghreb are supposed middle income (ESCWA, 2005).

The area once had the greatest population growth rates in the world. Fertility declined significantly in the 1990s, but the rate of increase is still high – about 2 percent contrasted to 1.4 percent for the less-developed world as a whole. Also, the region's relatively large proportion of youths means that the population is expected to grow strongly in the future. UN-Habitat projects that the area will be home to some 395 million humans by 2020 (compared to about 303.9 million in 2003, and 144.6 million in 1975). It will be a challenge for the countries of the region to ensure that population growth is matched by corresponding social and economic development. (Table 2)

Table 2
Total population and average annual rate of change, 1970-2050

	Total population (billions)			*Average annual rate of population change (percentage)*		
Country area	*1970*	*2010*	*2050*	*1970 -1975*	*2005-2010*	*2045-2050*
World	3.7	6.9	9.2	1.9	1.2	0.3
Developing countries	2.7	5.7	7.9	2.4	1.4	0.4
Arab region	0.13	0.36	0.6	2.8	2.1	0.8

Source: United Nations (2009a).

Currently, in all Arab countries, the urban population is growing at a higher rate than the national population, where over half the population lives in towns and cities, and some cases reach more than 90%. Urbanization in the Arab world has been fuelled by high fertility rates, substantial rural-urban migration, international labor migration and the concentration of economic activity in urban areas (Table 3).

Table 3
Total population and average annual rate of change, 1970-2050

	Urban Population (billions)			*Percentage urban*		
Country area	*1970*	*2010*	*2050*	*1970 -1975*	*2005-2010*	*2045-2050*
World	1.3	3.5	6.4	36.0	50.6	69.6
Developing countries	0.68	2.6	5.3	25.3	45.3	67.0
Arab region	0.04	0.18	0.43	30.6	50.4	72.3

Source: United Nations (2007b).

Moreover, urbanization consolidated with the high fertility rates and large proportion of youth in the Arab world will continue to put burden on national authorities to address the socio-economic difficulties associated with city centers such as, generating employment opportunities, allowing services such as education and health, and promoting infrastructure that will keep movement with this growth.

Urbanization causes an increase in the emission of pollutants into the atmosphere, a higher need to remove lands, and a loss of biodiversity in virgin forests on a global scale and other socio-environmental problems. Narrowing the viewpoint into particular influential developing nations, such as Arab countries and focusing on how they have been affected, we have been able to examine, in better and more detailed ways, how urbanization has been an increasingly important factor within these countries' present state. The development of these countries has boosted their gross domestic product (GDP) and economic standing (especially oil countries); however, it has come with significant environmental costs. If these countries do not change their current patterns of consumption and production, the negative consequences will outweigh the economic benefits halting their development altogether.

Through this chapter, the current problems are thoroughly examined, as well as their implications for society. Pollution, deforestation, water scarcity and biodiversity loss are a major result of Arab countries' rapid urbanization. Because of these troubles the development of these countries could potentially be jeopardized.

URBANIZATION TRENDS IN THE ARAB STATES

The Arab region is characterized by the widespread and very fast expansion of cities, with this significant level of urbanization bringing about a range of social, economic, and demographic shifts. Today, urban areas account for 56 percent of the total population of 320 million; this figure is predicted to increase to 66% by 2020. The "urban explosion" witnessed in the Arab world has not just been apparent in the massive growth of the region's main cities, but small- and medium-sized towns have also shown high and speedy levels of urbanization and development. Rapid population growth continues an important challenge. Some countries have annual population growth percentages between 3 and 5.5 percent, although some urban growth rates are even greater: 6.4 percent (Iraq), 5.9 percent (United Arab Emirates), and 4.1 percent (Oman and Bahrain). Urban growth rates will continue higher than total population growth rates for the foreseeable future. Although these changes show a sustained increase in the Arab states, they give rise to a manner of urbanization that is far from uniform.

The diversity of national circumstances and the existence of distinct urban traditions in every country explain the heterogeneity of the city contexts (Kharoufi, 1996). In the region's more diversified economies, urban growth has been the outcome of rural-to-urban migration as well as high fertility and diminishing rates of mortality. In some countries, however, elevated levels of urbanization have been spurred by transnational migration as well as the natural increase

(UN-Habitat, 2001). Metropolitan population is greatest in the smaller states (Kuwait 98.5 percent and Qatar 99.7 percent). Saudi Arabia, one of the highest Arab countries, is 85 percent urban by 2011(Table 4). Egypt is 45 percent metropolitan and Sudan 36.7 percent. Both countries will remain among the regions least-urbanized in the years to come. Currently, there are 19 mega-cities in the world (*i.e.* with populations exceeding 10 million), with an overall population of over 275 million and 8.8% of the earth's urban population, four of which are from matured parts of the world. The other 15 mega-cities are from the developing countries. Cairo is the only mega-city in the Arab sector with 11.1 million inhabitants.

In the Arab states, the urban framework often appears to be in a state of disequilibrium due to geographical constraints. This essential feature does not apply a similar pattern of improvement. Apart from the "City States" of the Gulf Cooperation Council, where the appearance of one metropolis dominates the whole urban arrangement, varying degrees of unbalance can be noted in the other nations

Table 4
Number of vehicles per 1,000 inhabitants (2007-2011), Arab countries

Rank	*Country*	*Motor Vehicles per1000 people*	*Notes*
7	Qatar	724	2007
28	Bahrain	509	2008
29	Kuwait	507	2007
35	Lebanon	434	2011
40	Saudi Arabia	336	2011
43	United Arab Emirates	313	2007
47	Libya	291	2007
53	Oman	225	2007
72	Algeria	154	2010
74	Jordan	146	2011
84	Tunisia	114	2008
98	Morocco	71	2007
101	Syria	62	2008
108	Iraq	50	2011
110	Egypt	43	2008
113	Palestine	39	2008
117	Yemen	35	2007
118	Comoros	33	2007
120	Djibouti	28	2011
120	Sudan	28	2007
135	Mauritania	5	2011
137	Somalia	3	2011

World Bank (2011) URL http://go.worldbank.org/3QT2P1GNH0

(Kharoufi, 1996). In the case of the Maghreb, (Algeria, Libyan Arab Jamahiriya, Morocco, Tunisia), notwithstanding initial renovation of the balance of regional disparities with interest to the concentration of city dwellers, the coastal regions still display the highest degree of urbanization. As for the "urban explosion" prevailing on the outskirts of big centers (Casablanca, Algiers, Tunis), a significant observation has been the intensification of relations between these centers and their suburbs (Kharoufi, 1996). The region's considerable internal differences are reflected in the conditions in its capitals and have resulted in widely varying domestic requirements and priorities: rehabilitation and regeneration (Iraq, Lebanon, Palestine and Somalia); poverty alleviation (Egypt, Jordan, Syria, Morocco and Yemen); urban administration and home needs (Egypt, Jordan and Algeria); and capacity building (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates, Libyan Arab Jamahiriya) (UN-Habitat, 2001).

Because the Arab Region has undergone rapid urbanization since 1970, it is now more highly urbanized than developing countries as a whole. Today, half of the Arab Region is urban, compared to 45 percent for developing countries. However, there is significant diversity in the urbanization levels reached by the countries in the Region. While Bahrain, Djibouti, Kuwait, Lebanon and Qatar have levels of urbanization above 85 per cent, the level of urbanization is around one-third of the total population in Comoros, Somalia, and Yemen. The Region's urban population is highly concentrated in a few countries. In 2010, two-thirds of the Region's 181 million urban dwellers lived in six countries. In many developing countries, natural extension (the number of births minus the number of deaths) accounted for at least 60 percent of urban dwellers increase, with internal migration and reclassification accounting for the rest. The Arab Region is projected to see its urban population more than double, increasing by 251 million between 2010 and 2050. By 2050, about three-quarters of the Arab Region will be urban. Today on Earth, there are 19 megacities (urban agglomerations with at least 10 million inhabitants). Cairo with a population of 12 million inhabitants is the Arab Region's single megacity and the 13th largest megacity in the world. By 2050, Cairo is projected to have a population of nearly 16 million. At present, other large urban agglomerations in the Arab Region include Baghdad, Iraq (5.1 million), Riyadh, Saudi Arabia (4.5 million), Algiers, Algeria (3.4 million) and Jeddah, Saudi Arabia (3.1 million). In 2005, the Arab Region had some 43 million slum dwellers. Northern Africa has the lowest slum prevalence in the developing world, 15 percent (UN Habitat, 2009).

WATER AND SANITATION

Access to acceptable drinking water sources continues a problem in the Arab region. Between 1990 and 2004, the proportion of the population using such water sources was constant at around 82%. Regional disparities exist: there were improvements

in the GCC, Mashreq, and Maghreb, raising the rates there to 100%, 94%, and 86%, sequentially, but the percentage for the Arab LDCs dropped from 68% to 63%. It is clear, therefore, that more trials still need to be made in order to improve the situation for the people still without sufficient access to drinking water (ESCWA/LAS, 2007) (Figure 3). There still exist wide discrepancies among rural and urban populations when it comes to access to advanced water sources; in 2004, the proportion of the population with such access in rural areas was 13% shorter than that in urban areas. This big difference can essentially be explained by the significant divide between urban and rural populations in the Maghreb; 56% of the Maghreb community lives in Morocco, where the percentages for urban and rural are 99% and 56%, sequentially. For Arab LDCs, the condition is equally grim: nearly half the rural population has no access to improved water sources. It is clear that the national development policies in the county need to take this dilemma into account and near the rural-urban gap (El-Habr, 2007).

As for access to sanitation abilities, we can observe slow improvement in the Arab sub-regions during the last 15 years. In 2004, the dimension of the population in Arab LDCs with access to improved sanitation facilities was only 42% correlated to 99% in the GCC, 87% in the Maghreb, and 84% in the Mashreq. Nonetheless, at this pace, an estimated 124 million people in the Arab region will remain without access to sanitation equipment by 2015 and 50% of these people will be living in the Arab LDCs (ESCWA/LAS, 2007). Figure 3 shows the proportion of population

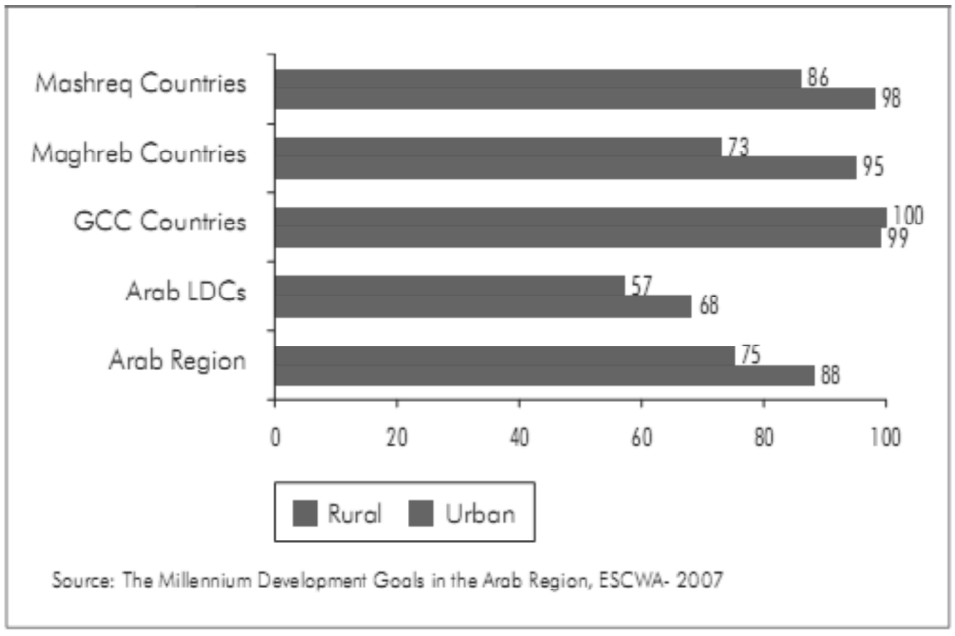

Figure 3: Proportion of the population using improved drinking water sources.

using advanced sanitation facilities, 2004 (%). As with access to clean water, way to sanitation facilities varies widely between urban and rural areas; the disparity is particularly striking in the Arab LDCs, where the number stands at 26% and 60% for rural and urban areas, sequentially. Nonetheless, the improvements as mentioned above of the last 15 years have mostly been due to improved access to the countryside in the region. In fact, it is fascinating to note that the proportion of rural populations with access to clean sanitation facilities improved by 13%, 14%, and 8% in the GCC, Mashreq, and Maghreb regions, respectively, rising from 54% to 59% in rural areas in the Arab region as a whole. At the same time, the percentage dropped in urban areas from 87% to 85%, though this fall can partly be credited to the increased pressures on urban infrastructures through rural-urban migration (ESCWA/LAS, 2007).

The Arab countries estimate for more than 5 percent of the world's population, but fewer than 1 percent of global water resources. And as a result of the happenings associated with climate change, the region is facing an even greater water deficiency. Water stores in the Arab countries are under inconsiderate pressure. Demographic growth (2.6 percent), economic growth, urbanization, industrialization and the development of irrigated agricultural lands have all committed to a dramatic and unsustainable increase in water using over the past few decades. Repeated droughts, in conjunction with an overuse of groundwater and principal aquifers, have significantly decreased the availability of renewable and non-renewable water resources.

Most of the Arab countries are resultantly heading towards a severe water scarcity. A close look at the contemporary status of the water supply reveals that it is continuing to decline. By 2025, the per capita water quantity will be almost 500 m3/cap/yr. or 15 percent of what it used to be in 1960 when it reached at 3,300 m3/cap/yr. (IFAD 2009).

POLLUTION

Air Pollution

As the air quality in Arab towns continues to regularly deteriorate, the costs of health and environmental consequences are drastically rising. Health problems associated with air pollution from the transport sector alone cost Arab countries over five billion dollars yearly. Countries in the Arab country are highly reliant on private transport, a phenomenon highlighted by the soaring car ownership rates. For instance, the number of vehicles per 1000 inhabitants is 434 in Lebanon, 724 in Qatar, 507 in Kuwait, 336 in Saudi Arabia, and 509 in Bahrain. (Table 4). The transport sector is accountable for approximately 90% of total emissions of carbon

oxides in Arab countries. In spite of several welcome initiatives to ban it, lead continues an additive in petrol in some Arab countries, and still considers for more than half of total lead atmospheric emissions. Some states abruptly introduced unleaded fuel, without forcing the use of additives required for efficient operation of the old formation of vehicles with older engines, which constitute the bulk of the cars in most nations. The inefficient combustion has consequently led to an alarming increase in the levels of ground ozone, a gas with devastating effects on health.

Although Arab countries are the world's largest producers of petroleum-based energy sources, the levels of air pollution in Arab countries, in common, are among the lowest in the world. In 2003, carbon dioxide eruptions did not exceed 1,012.5 metric tons in the Middle East and North Africa region, related to 10,753.5 million metric tons in middle-income nations and 12,738.4 million metric tons in high-income countries. The only countries with lowering carbon dioxide emission rates that year were sub-Saharan African countries, with an aggregate of 531.9 million metric tons.

Nevertheless, what offsets this seemingly optimistic portrait is that Arab nations have so comparatively low carbon dioxide emission rates primarily because most have not proceeded very far in industrialization. Even so, carbon dioxide emissions in North Africa and the Middle East are increasing at one of the quickest rates in the world. From 1990 to 2003 this percentage was 4.5 percent per year, which means that carbon dioxide emissions had nearly increased by the end of that period. The only region in the world to exceed the Arab countries on that score was South Asia, at a rate of 4.9 percent per year. It should also be sustained in mind that carbon dioxide emissions vary among Arab countries, with the leading, in general, found in the oil producing and exporting countries, especially those in the Gulf, as well as the nations with the highest economies.

The top three are Saudi Arabia, Algeria, and Egypt. Moreover, carbon dioxide emissions rates vary considerably within Arab countries, the most marked contrast being between rural areas and major urban centers. The same observations implement to methane and nitrogen oxide emissions.30 Efforts at the global level to decrease or at least maintain air pollutant emissions have had some success since the initiation of stricter environmental regulations and enforcement policies, creating in the 1970s. Despite, in the Arab region, socioeconomic development, population increase, water scarcity and the growth of the oil industry have started to expand the use of heavy fuels to meet development requirements including power generation, cement generation, oil refining and desalination of water.

Apart from meeting improvement needs, transport is another major factor in air pollution in the region. Air traffic is growing in the Arab countries, which is considered a major air transit route. The fleets that operate exclusively inside it do

not all meet mandatory aircraft engine certification standards, and hence do not all abide by the international environmental protection measures governing aviation emissions and the development of air traffic management systems.31 The increase of private vehicles has also made a significant impression.

Air contamination in the Arab countries is attributed among others, to the transport sector, with its dependence on cars, especially in urban areas and during heavy traffic congestion. Road traffic in the Arab countries makes a variety of environmental and health impacts. Though the use of natural gas in the sector of carriage has developed, the pollution is aggravated by such local inclinations as high rates of private vehicle ownership, as in Lebanon, Qatar, and Kuwait and the ageing of vehicle squadrons (in Egypt, for example, 65 percent of cars are at least 10 years old, and 25 percent are more than 20 years old). Nevertheless, a reduction in released pollutants is anticipated as a result of regional efforts to apply traffic strategies and fuel adjustments in most Arab countries (See Table 5)

EMISSIONS IN THE ARAB WORLD

Most countries in the area, and in particular urban centers (the capitals and other major cities), suffer from different levels of air pollution. About 90 percent of total discharges of carbon monoxide (CO) in Arab countries is due to transportation activities. It is estimated that Arab nations emit collectively about 16 million tons/ year of CO (El Raey, 2006). The Arab vehicle fleets release 1.1 million tons/year of nitrogen oxides (NOX). Among 70 and 80 percent of total hydrocarbon (HC), emanations arise from the transportation sector and play a significant part in the development of photochemical oxidants. Lead, used as an additive in petrol, still values for more than half of total lead atmospheric discharge in the Arab countries and almost 100 percent in urban regions. Diesel engines also emit sulphur dioxides (SO2) and fine particulate.

Stationary roots, such as thermal power plants, refineries, smelters, fertilizers plants, cement production, and water desalination plants also significantly present to air quality deterioration. Industrial compounds and producing facilities emit gasses such as CO_2, methane, Volatile Organic Compounds (VOCs) and nitrogen oxide (NOX). In the Gulf Cooperation Council (GCC) countries entire atmospheric

Table 5
Arab countries annual emissions (1000 tons) from the transport sector, and the percentage this represents of total emissions

	SO_2	NO_x	*TSP*	*CO*	*HC*
Road Transport	200(5 %)	1100(37%)	120(10%)	16000(< 90%)	3000(< 80%)

Source: El Raey, 2006

emission weights are about 3.85 million tons per year, made of 28% CO, 27% SO_2 and 23% particulates (UNEP, 1999). Recent studies have indicated that the Gulf countries to emit about 50% of the whole of Arab countries' (254 million metric tons of carbon) radiations of CO_2. A summary of various regional emissions is presented in Table 6.

BIODIVERSITY

The Arab world houses a unique biological diversity regarding species and ecosystems represented by arid, semi-arid, and Mediterranean biomes. The reported number of species currently harbored in the Arab world is listed in floras, compendiums, and country reports. The richest countries recorded regarding plant variety with more than 3000 varieties include Egypt, Lebanon, Morocco, Syria, Algeria, Tunisia, and Somalia, while animal variety is tremendous with more than 5000 kinds in Algeria, Lebanon, Syria, and Tunisia (CBD national reports). The density is estimated at 1000-2000 plant species per 10,000 km^2 in Jordan, Lebanon, Morocco, and Syria and less than a 1,000 per 10,000 km^2 for the outstanding Arab countries. The frequency of mammal species ranges between 21-50 animal varieties per 10,000 km^2 in Egypt, Iraq, Jordan, Morocco, Sudan, Syria, and Tunisia, with a vast range of 51-100 in Lebanon and a variety of less than 20 in the prominent countries (The Atlas of Endangered Species, 2005). Many types in the Arab world currently face significant warnings which will be augmented in the future due to the repercussions of urbanization and climate change.

Table 6
National Parks and Protected Areas in the Arab Region

Country/ Territory	*Area (square kilometers)*	*Total Protected Area (hectares)*	*Percentage of Area under Protection*
Bahrain	691	1325	1.92
Iraq	434924	541	–
Jordan	83750	119829	1.43
Kuwait	24280	30000	1.24
Lebanon	10452	4512	0.43
Oman	212379	2836900	13.36
Qatar	10360	100	0.01
Saudi Arabia	2144969	21210740	9.89
Syrian Arab Republic	185680	103240	0.56
United Arab Emirates	86449	14650	0.17
West Bank and Gaza Strip	10161	–	–
Yemen	485273	–	–
Total	3,689,368	24,321,837	6.59

Source: ESCWA/FAQ

On terrestrial biodiversity and more specifically plant biodiversity, according to the 2008 IUCN threat categories, Yemen has the greatest number of threatened species at 159 while the surviving countries either did not register any data or range between 0 to 17 species. On animals, the states with the highest number of endangered species as per 2008 IUCN sections contain Djibouti, Egypt, Jordan, Morocco, Saudi Arabia, Somalia, Sudan, and Yemen, which all have higher than 80 threatened animal species, with a maximum of 108 species in Egypt. An overall status of threatened species in the Arab world is summed as per particular taxonomic group in (IUCN, 2008). Marine biodiversity near the coasts of the Arab world bestows critical threat levels in selected areas such as the highly endangered dugongs in Bahrain whose sea grass foraging grounds encompassing the archipelago form the world's second greatest dugong aggregation (a tightly linked group of dugongs, large marine herbivorous mammals, occupying the same area) after Australia. In addition, dolphins and whales in international waters were classified in 2000 as critically endangered, endangered or vulnerable and numbered between 11- 16 species on the northern coast of Morocco and between 6-10 classes in the Mediterranean Basin, the coast of Mauritania, and the southern coast of Morocco (The Atlas of Endangered Species, 2005).

Most of the Arab states established and are continuing to create and maintain protected areas on land and in the sea (Table 7). But the Arab region has one painfully negative record. For the first time in its history, the UNESCO World Heritage Program had to take the hard decision of removing one site from its glamorous list of global natural wonders, the location in question being an Arabian Oryx Sanctuary in Oman. The Omani government itself had requested removal of the site from the list and both UNESCO and the International Union for Conservation of Nature (IUCN) reluctantly complied. IUCN had identified serious threats to the natural values of the site for some years. These were discussed several times by the World Heritage Committee, which called for urgent action to address the threats. The population of Arabian Oryx has significantly declined from 450 in 1996 to the current situation where there remains only one breeding herd of four females and four males. The capacity of the Arabian Oryx Sanctuary to maintain a viable free-ranging population of this endangered species has been remarkably reduced. This bizarre episode constituted a particularly significant loss since, among the Arab countries; Oman has a very impressive record of environmental awareness and effective policies. The high importance assigned to wildlife conservation by Arab leaders could be seen, however, as out of sync with the region's priorities as identified by environmental ministers.

Wildlife and habitat protection receive almost as much attention in the press of some Arab countries as freshwater issues, and nearly ten times as much as either air pollution or climate change, this may reflect an imbalance in priorities.

Arab nations–except Jordan and Palestine–do not publish accurate reports on environment statistics. Some them release State of the Environment Reports. Particularly significant data gaps exist in the Arab region in some key areas:

- *Land:* Lands use (agricultural and cultivatable land) and land degradation; there is the no usage of the Land Degradation Assessment Drylands (LADA) method for classification.
- *Biodiversity:* Threatened species, protected areas, and forest cover.
- *Coastal ecosystems:* Marine pollution, urban development in coastal zones, and destruction of marine habitats.

CONCLUSION

Though industrial growth and urbanization are often seen as being economically beneficial, it has the potential to cause serious environmental harm if left unchecked. By looking at the countries of the Arab world in their differing stages of development, we were able to gain a better perception of the ways in which urbanization is specifically affecting the areas of pollution, water scarcity, and biodiversity loss. Due to the growing urban population, a cycle of destruction is created. Almost all Arab countries have a high cumulative carbon dioxide emission especially in oil countries (Cooperation Council for the Arab States of the Gulf-GCC). One of the biggest causes of the high amount of carbon dioxide is the increase in transportation and industry, a symptom of the significant amount of urbanization all countries are experiencing.

The urban air quality is inconsistent nationally speaking and also varies from season to season. Water stores in the Arab countries are under relentless pressure. Demographic growth (2.6 percent), economic growth, urbanization, industrialization and the expansion of irrigated agricultural lands have all committed to a dramatic and unsustainable increase in water consumption over the past few decades. Because of this rapid growth and change, all countries are facing serious problems of losing their biodiversity. Biodiversity loss happens when countries urbanize and do not take the effects on the environment into account. The location of Arab countries makes them prone to biodiversity loss.

Because of constraints on land and water, rural areas have long ceased to provide attractive employment prospects in the region. Men, especially young men, have been steadily migrating to urban centers for the past several decades, bringing or establishing families after getting a start. Although steady employment is not readily available, the occasional job available in urban areas pays better and is more frequent than seasonal work in farming communities. Rapid urbanization poses some other challenges to the regimes in the region. The provision of water,

sanitation, transportation, and the quality of the housing stock in these immigrant areas are inadequate. On a daily basis, these immigrants are confronted with the failure of the government to provide minimal services.

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