

**JOER**

**DAN**

**ENVIRONMENT AND SECURITY**

Zoï REPORT 1/2011



Water level indicators in Ziglab dam near Al Aziyya in northern Jordan  
Photography: © Paolo Pellegrin / Magnum Photos



# Jordan

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## **Zoï REPORT 1/2011**

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# Introduction

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Jordan is an ideal case study to highlight the tension between available resources and rising demand in the Middle East, but also globally. Since its creation as a modern state in the early 20th century, Jordan has been dependent on outside resources not only for its economic development but also for its survival. The current report focuses on water problems in Jordan to highlight the difficult decisions which need to be taken at a time when energy, food and funds are all in short supply. Jordan continues to rely on outside support for the design of future projects. But how will growing pressure on the global supply of resources impact on countries such as Jordan?

Many studies of the future challenges facing the Middle East have expressed alarm. Generally rich in hydrocarbon resources the region is poor in water. Water is increasingly seen as one of the century's strategic resources, much as hydrocarbons have been since the early 20th century. Climate change could further amplify water stress as temperatures rise and precipitation decreases. Population growth remains solid in the region, at twice the average global rate (respectively 2% per year and 1.2%). The population of the Arab world will more than double between 1980 and 2015, rising from 172 million to a projected 385 million<sup>1</sup>. Jordan is probably the most resource-poor country in the region, and worldwide. Not only is Jordan extremely poor in water, it also has to import all its energy. Increasingly the country is importing most of its basic foodstuffs in the form of cereal imports. Jordan (population 6 million) thus lacks all three strategic resources: food, water and energy.

In its short modern history Jordan has faced major security challenges. The country stands on the main fault line of the Arab-Israeli conflict, having accepted legal responsibility for the West Bank after the creation of the state of Israel in 1947. Following the wars of 1948 and 1967 hundreds of thousands of Palestinian refugees moved to the East Bank, where they form the majority of the population in major urban centres such as Amman, Irbid and Zarqa. Although the country benefited from the oil boom in the Gulf – up to a third of Jordan's workforce was working in the Gulf in the 1980s. Regional insecurity has had a negative impact on Jordan: following the Iraqi invasion of Kuwait and the political polarization of the region, 300 000 Jordanian workers were expelled from the Gulf, returning home to a deepening social crisis.

Since modern Jordan was created, it has depended on substantial foreign subsidies. Initially Britain, as the former colonial power, provided a substantial share of the state budget. More recently Jordan has depended on the financial support of the US, Saudi Arabia and other Gulf states, to cover public expenditure.

In the past, Jordan has witnessed “riots” following fuel-price hikes and devaluation of the dinar, as in 1989. These events were part of a larger process in the Arab world, with mass protests erupting in major cities after prices increased in response to pressure from the International Monetary Fund (IMF) – Egypt in 1977, Morocco in 1981 and 1984, Tunisia in 1985, Algeria in 1988, and Jordan in 1989. In Algeria and Jordan the demonstrations and clashes led to political liberalization and free elections, neither of which ultimately led to democratic consolidation<sup>2</sup>.

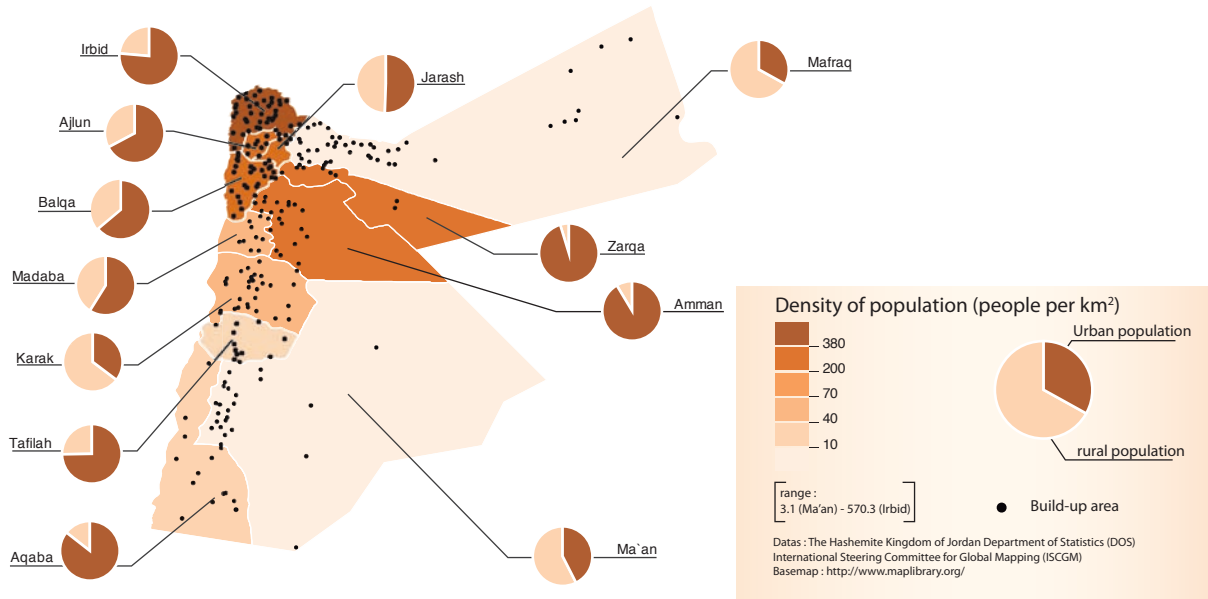
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<sup>1</sup> Arab Human Development Report 2009, Challenges to Human Security in the Arab Countries, UNDP, 2009, page 35 : <http://www.arab-hdr.org/contents/index.aspx?rid=5>

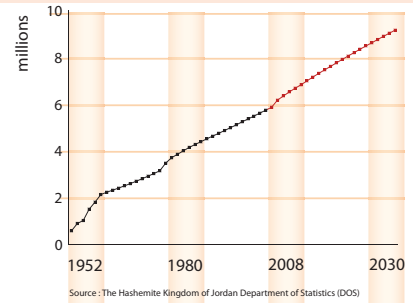
<sup>2</sup> Ibid, page 74.

# Jordan population, 2008

Density of population by governorate (12) and part of urban/rural population



## Jordan population trends and projections



In 1996, in order to meet IMF conditions on debt restructuring, the government removed subsidies on food imports, instantly doubling bread prices and sending basic food prices soaring. This was followed by two days of “food riots”, especially in the central town of Karak. In 2003 subsidies on fuel were also scrapped. At present consumers pay international prices for the oil they consume. The end to subsidized imports of mainly Iraqi oil put Jordan in a precarious position. Rising oil prices increase remittances from Jordanian migrants working in oil-rich Arab countries, but hit the domestic economy hard, with higher prices for the oil it consumes. Jordan stayed quiet in 2008, despite the end of the remaining fuel subsidies, raising fuel prices by 76% overnight. The social and economic situation in the kingdom is nevertheless tense, and any further deterioration in living standards for local or international reasons could have social and political repercussions.

The present report looks at the current state of debate on the environment, resources, climate change and current policies in Jordan. It is based on interviews carried out in Jordan in December 2010. It aims to take a detailed look at the current debate in the smallest of Middle Eastern economies and one of the most resource-poor countries in the region. It hopes to contribute to ongoing efforts to find ways of addressing problems related to natural resources and environmental degradation from the point of view of human security. The case of Jordan also shows the close linkage between water, energy and food supplies, and how strategic decisions in addressing resource-related issues are highly political in their nature and can in turn shape the political space in the troubled Middle East.

## Jordan and the Al-disi aquifer





# Water deficit

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Water is the major resource problem facing Jordan, one of the most water poor countries in the world, and the most visible one. When it gained its independence in 1947, it had 3 600 cubic metres of water per person per year (CMY); now, after rapid population growth and waves of refugees, the figure has dropped to 140 CMY, making it the fourth most water-stressed country in the world<sup>3</sup>. Conditions are projected to decline further by 2025, dropping to 121 CMY<sup>4</sup>. The United Nations estimates that below 1 000 cubic metres per person a country enters water scarcity, which hinders economic development and affects public health.

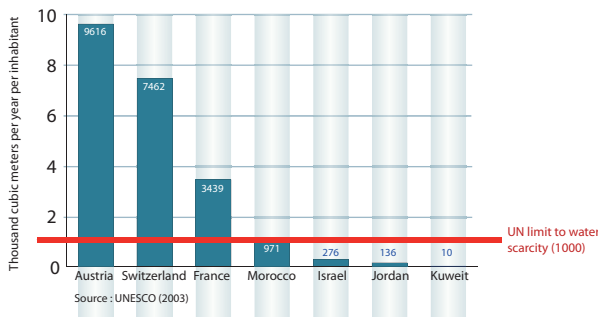
Jordan also has a water deficit, currently consuming 1.35 billion m<sup>3</sup> a year, whereas the annual water supply only amounts to 1 billion m<sup>3</sup>. The gap is covered by water pumped from various aquifers, either in the highlands or the southern Disi fossil aquifer. The water deficit is projected to grow as the population rises

from 6.4 million at present to 10.2 million in 2050<sup>5</sup>. Over the same period, climate change models project both a decrease in rainfall and higher temperatures, reducing the availability of renewable water.

The most visible expression of Jordan's water problems is the shrinking Dead Sea. It started in 1964 when the Israeli government diverted the Jordan river to the National Water Carrier to channel water to its coastal cities and cultivate the Negev desert. Now only 100 million m<sup>3</sup> or 10% of the initial volume of the Jordan reaches the Dead Sea, containing no freshwater but only outflow from sewage systems and polluted agricultural runoff.

The shrinking Dead Sea is a visible manifestation of a global problem which is especially acute in the Middle East: we are consuming more water than is available and renewable in nature. In a region suffering from a water shortage, Jordan is in the worst position: one of the practical implications for the population is that the authorities distribute water to households once a week, and once every two weeks at times of acute shortage notably summer and autumn. It means that every household needs tanks to store water and must buy drinking water from the market. It also has implications for the economy: the country has to spend an increasing share of its meagre resources to secure water for its people and industry. Demand for water is expected to rise with population growth. By 2020 water demand is projected to reach 1.62 billion m<sup>3</sup> (940 million m<sup>3</sup> in 2005<sup>6</sup>). The government is hastily developing projects to bridge the growing gap.

## Water availability : a comparison



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<sup>3</sup> Author interviews in Amman, December 2010; see also Elaine Deny et al, Sustainable Water Strategies for Jordan, University of Michigan, Ann Arbor, April 2008, page 2:

<http://www.umich.edu/~ipolicy/Policy%20Papers/water.pdf>

<sup>4</sup> Bassam Ossama Hayek, "Water Resources in the Arab World: A Case Study on Jordan", in Hans Günther Brauch et al (eds.), Facing Global Environmental Change, Springer, Berlin, 2009, page 615.

<sup>5</sup> Jordan Demographic Profile, UN Economic and Social Commission for Western Asia: <http://www.escwa.un.org/popin/members/Jordan.pdf>

<sup>6</sup> USAID, Responding to the Water Crisis in Jordan, page 18.

One major project is the Disi Water Conveyance currently under construction. Disi is an underground fossil aquifer – non-renewable underground freshwater – in the south of the country, straddling the Saudi border. Both Saudi Arabia and Jordan are already pumping Disi water both for communal use but also for agricultural purposes. With French funding and US guarantees, Jordan has contracted a Turkish company to dig some 55 wells on Disi and build a 325-kilometre pipeline from the Saudi border to Amman, with several pumping stations. This will supply 110 million m<sup>3</sup> for some 50 years, covering 10% of national water consumption at its current rate. The project will cost nearly US\$1 billion and water will start flowing in 2013. But by 2020 the water deficit will start growing again.

Additional projects are consequently needed to cover the imminent shortfall. Jordan has resurrected old plans for a Red Sea-Dead Sea Canal. This idea was first raised in 1855 by a British naval officer, William Allen, the aim being to open an alternative sea route to the east by connecting the Mediterranean to the Red Sea via the Dead Sea. Since then many versions have been drawn on paper yet none really implemented. Yet, in the face of a severe water crisis, and as a way to save the Dead Sea, the Jordanian government is pushing for a Red-Dead canal. The World Bank is currently financing two studies – a feasibility study and an environmental impact assessment – expected to be finalized in 2011. The project would pump water from the Red Sea, raising it by 140 metres before it flows down to the Dead Sea which is 400 metres below sea level. The Jordanian government intends to desalinate half of the 200 million m<sup>3</sup> of water to help cover the country's increasing water deficit, and supply the West

Bank and Israel. The projected cost of the scheme is rising all the time: in 2008 it was estimated at US\$5 billion, in 2010 estimates exceeded US\$7 billion.

The projects under study are surrounded by a fog of uncertainty due to the lack of information, prompting rumour and speculation. Jordanian governmental officials and experts fear that the international community will not ultimately fund the project because Israel is no longer interested in the Red-Dead canal<sup>7</sup>. Some environmental campaigners in Jordan are also hostile, on the grounds that such costly projects are not the best answer to Jordan's water needs. Funds would be better employed curbing current losses and changing patterns of consumption, especially in agriculture.

Even with these projects Jordan will still be in water deficit over the coming decades. According to Jordan's Ministry of Water and Irrigation report, Jordan's Water Strategy 2008-22, the country will need 1.63 billion m<sup>3</sup> by 2022, a quarter of which will still not be renewable<sup>8</sup>.

As we shall see below Jordan has other worries apart from water, in particular energy. Jordan already imports 97% of its energy consumption. To realize major projects, such as pumping 200 million m<sup>3</sup> a year from the Red Sea to the Dead Sea, or operating major desalination plants, the country needs a new energy supply. The energy generated from the water flowing down from the Red Sea to the lowest point on the ground does generate hydropower, but it is only enough to cover 20% of the energy needed to pump the huge amounts of water uphill and to desalinate half of it. Jordan consequently needs to secure new energy sources, before it can complete the Red-Dead canal.

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<sup>7</sup> Author interview in Amman December 2010.

<sup>8</sup> See Jordan's Water Strategy 2008-2022, Ministry of Water and Irrigation, page 2 of chapter 2 of the report, available : [http://www.idrc.ca/uploads/user-S/12431464431JO\\_Water-Strategy09.pdf](http://www.idrc.ca/uploads/user-S/12431464431JO_Water-Strategy09.pdf)

## Schematic map of the Red-Dead canal



### installations

- ⊕ reservoir
- ⊕ intake and pumping station
- ⊕ hydropower plant

### administration

..... national borders

### tunnel options

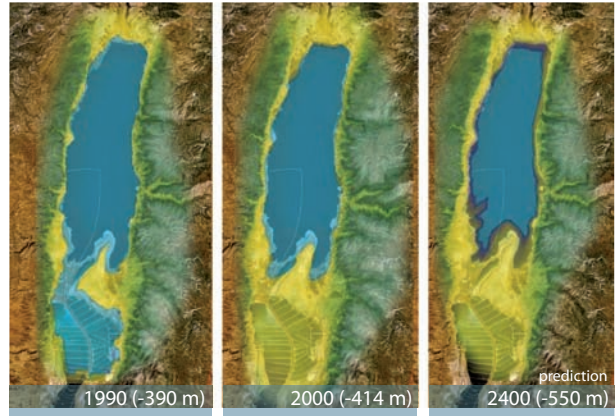
- penstock alignment
- ==== tunnel

### pipeline option

- pipeline alignment
- ==== tunnel

Source : Red Sea – Dead Sea Water Conveyance Study Program Feasibility Study - Coyne et Bellier  
 Basemap : Google Earth

## Water Level of the Dead Sea 1990, 2000 and 2040



Source: DTM by Dr. John K.Hall



Water distribution by truck in a beduin camp  
Photography: © Paolo Pellegrin / Magnum Photos





# Agriculture and food security

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Between 65 and 75% of Jordan's water goes to agriculture, while the remainder is used for drinking water, industry and tourism. Yet, the share of agriculture in the overall national economy has been dropping for several decades: in the 1950s it contributed 40% of gross domestic product, but by 1988 it had fallen to 6.9% of GDP, dwindling to only 2.8% in 2008<sup>9</sup>. Farming employs only 2.7% of the workforce, over half of whom are immigrants, mainly from Egypt. Many argue that agriculture consumes too much water to produce too little for the overall economy.

Cereals constitute the main dietary energy supply (53% in 1996-98), comprising mainly wheat, of which 3 to 4% is produced locally, and rice, all of which is imported<sup>10</sup>. In 2010 Jordan imported 700 000 tonnes of wheat, 600 000 tonnes of barley, 450 000 tonnes of corn and 140 000 tonnes of rice<sup>11</sup>. Local wheat production for 2010 was estimated at 20 000 tonnes, and barley production accounted for 3 to 5% of total requirements. These figures highlight Jordan's total dependence on cereal

imports, exposing the country to social problems when prices on the international markets fluctuate<sup>12</sup>.

Output of strategic cereal products such as wheat dropped from 250 000 tonnes in the 1960s to only 20 000 tonnes now, due to changes in land prices. Following the second world war global cereal prices started to fall, conditioned by rising production thanks to industrialization of agriculture. As Nizar Abu Jaber explains in his recent book, Jordanian agriculture could not compete with large producers in the US and elsewhere, so production costs stayed high and failed to compete on the world market. Moreover the Jordanian government did not adopt protectionist policies nor attempt to achieve self-sufficiency, unlike neighbouring Syria. Jordanian cereal production consequently became uncompetitive<sup>13</sup>. From the 1960s onwards rising population and rapid urbanization drove land prices sharply upwards in Amman and the Jordan valley, encouraging farmers to sell their land to developers for building. "In spite of all the awareness-raising

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<sup>9</sup>Jordan at a Glance, World Bank, September 12, 2009 : [http://devdata.worldbank.org/AAG/jor\\_aag.pdf](http://devdata.worldbank.org/AAG/jor_aag.pdf)

<sup>10</sup>See Nutrition Country Profiles – Jordan, FAO, Rome, August 2003, page 10 : [p://p.fao.org/es/esn/nutrition/ncp/jormap.pdf](http://p.fao.org/es/esn/nutrition/ncp/jormap.pdf)

<sup>11</sup>Jordan, Grain and Feed Annual, USDA, September 14, 2009 : [http://gain.fas.usda.gov/Recent%20GAIN%20Publications/GRAIN%20AND%20FEED%20ANNUAL\\_Amman\\_Jordan\\_9-14-2009.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/GRAIN%20AND%20FEED%20ANNUAL_Amman_Jordan_9-14-2009.pdf)

<sup>12</sup>Omar Obaidat, "Rise in Wheat Prices to Strain State Budget", Jordan Times, August 10, 2010: <http://www.jordantimes.com/?news=29073>. According to FAO, food prices in December 2010 reached record high, surpassing those registered in July 2008 which caused riots in a number of countries. See Jill Treanor, "World food prices enter 'danger territory' to reach record high", Guardian, January 5, 2011: <http://www.guardian.co.uk/business/2011/jan/05/world-food-prices-danger-record-high-un>

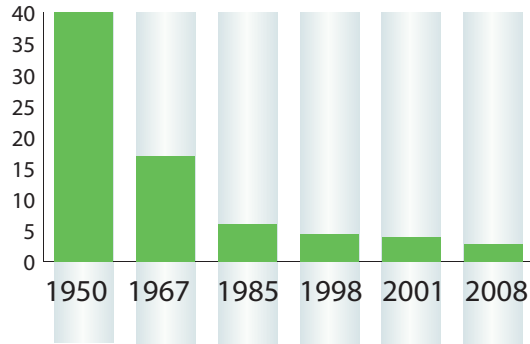
<sup>13</sup>Nizar Abu Jaber, Al-Urdun wal-Ta'hadi al-Biei (Arabic: Jordan and Environmental Challenge), al-Shorok, Amman, 2011, page 51.



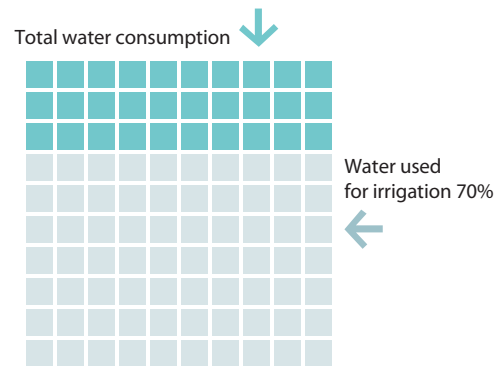
campaigns through radio, media and conferences to save agricultural land, there was simply no result. People had interest to turn their agricultural land to habitations because of the incredible discrepancy of prices between the two,” said Professor Mahmud Duwali, former minister of agriculture<sup>14</sup>. The shift from cereal production to cash crops for exports led to a further decline in cereal output.

Some people consider local agricultural production, even if it consumes many valuable, non-renewable water resources, is important to keep food prices at a level affordable by various social classes. “There is a debate on the current usage of non-renewable water sources for agriculture. Some argue that for social stability we need local production of fruit and vegetables at prices accessible to the population,” in the words of Yahya Khaled, an environmental specialist in Amman. He added: “Jordan is a tribal society, and tribes have political influence and some are very engaged in agriculture,” which gives reforms in the sector a complex political dimension<sup>15</sup>.

### Share of agriculture in gross domestic product



Source : The Hashemite Kingdom of Jordan Department of Statistics (DOS)



<sup>14</sup> Interview with Prof. Mahmud Duwali, Professor of Agriculture, University of Jordan, Amman December 8, 2010.

<sup>15</sup> Interview with Yahya Khaled, director of Royal Society for the Conservation of Nature, Amman, December 6, 2010.

# Energy dependency

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Jordan is dependent on imports for its energy: 96% of energy consumed in 2008 was imported, with oil making up 66% of all energy imports and natural gas 28%, conveyed by a pipeline from Egypt. This is a heavy burden on the national economy, as energy imports account for 21% of GDP (in 2008). To maintain current levels of energy consumption with rising population and to sustain economic growth Jordan needs to find new sources of energy<sup>16</sup>.

To support the economy from 2007 to 2020, Jordan's primary energy demand is expected to increase by between 4.5%, for a low scenario, and 6.2% annually<sup>17</sup>. Over the same period electricity demand is expected to grow by 7.4% a year. Jordan will need to invest about US\$3.4 billion (2007 currency equivalent) to meet growing energy needs<sup>18</sup>. This means that in 2020 the economy will require 15 million tonnes of oil equivalent, up from 7.6 million tonnes in 2007. Projected electricity demand in 2020 will require 5 770 megawatts (MW) of generating capacity, compared to the 2 100 MW available in 2007.

Jordan also plans to increase production of renewable energies, from 1% in 2007 up to 7% of its total energy needs by 2015 and 10% by 2020. The plan is to harness wind power, and to a lesser degree solar power. But it is doubtful that such objectives will be reached, as Jordan depends heavily on foreign capital investments, and

the market does not encourage massive investment in renewable energy in view of current global energy prices, and the relatively high cost of renewable energies at present.

Nuclear power is another potential energy source for Jordan. The discovery of uranium in several places in the kingdom has encouraged plans to construct a nuclear power plant. The French conglomerate Areva has an exclusive concession for uranium mining in a 1 400 square kilometre area in central Jordan, including the Swaqa, Khan Azzabib, Wadi Maghar and Attarat regions<sup>19</sup>. According to Khaled Touqan, the president of the Nuclear Energy Commission, the potential for uranium extraction from this area is 65 000 tonnes<sup>20</sup>. Negotiations are underway to choose the technology and the company to build the plant. According to the Jordanian authorities, construction of the nuclear plant will start in 2019, and the Jordanian leadership hopes that nuclear power will supply a third of Jordan's electricity needs by 2030<sup>21</sup>. But the debate on the location of the nuclear plant reveals both technical and political complications. The first site chosen was in the south, eight kilometres from Aqaba. More recent statements suggest Jordan intends to build the plant near al-Mafraq in the north. This may be due to Saudi opposition to siting of a nuclear plant near its northern border. The final location of the future nuclear plant is far from being settled and discussion continues.

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<sup>16</sup> See slide number 2: <http://www.jiic-jo.com/pdf/day1/Infrastructure/H.E.Eng.KhaldounQteishat.pdf>

<sup>17</sup> The National Energy Research Centre, "Update Master Strategy of Energy Sector in Jordan for the Period (2007-2020), December 2007, page 8: <http://www.nerc.gov.jo/Download/english%20-energy%20strategy.pdf>

<sup>18</sup> Ibid, page 16.

<sup>19</sup> Taylor Luck, "France stands by Jordan's Nuclear Programme" Jordan Times, July 14, 2010: <http://www.jordantimes.com/?news=28320>

<sup>20</sup> Michel Abu Najem, "Awal Ma'hata Nawawiya Satabda 'Amaliha 'am 2019" (Arabic: Work on First Nuclear Power Plant Will Begin in 2019), al-Sharq al-Awsat, March 11, 2010: <http://www.aawsat.com/details.asp?section=4&article=560558&issue=11426>

<sup>21</sup> Jay Solomon, "Jordan's Nuclear Ambitions Pose Quandary for the U.S.," Wall Street Journal, June 12, 2010: <http://online.wsj.com/article/SB10001424052748704414504575244712375657640.html>

# Media and environmental debate

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Are Jordan's mass media capable of explaining this complex situation to public opinion? Jordan has a vibrant civil society and largely pluralist media. It is consequently natural to expect the media to be able to provide extensive coverage of environmental problems – heavy pollution of rivers such as the Zarqa, or depletion of ground water resources – or more policy-related issues bearing on future options for securing food, water and energy for the Jordanian population. As to whether there is satisfactory reporting of environmental and resource-related issues in Jordan's mass media – an inevitably subjective question – there are two kinds of answers. Media professionals will tend to argue that the mass media have paid increasing attention to such issues in recent years, with increasing space devoted to matters of water or energy. But practitioners seem dissatisfied with media coverage, both in terms of quantity and quality.

Ahmad al-Kofahi is the director of Jordan Environment Society, and he complains about the low level of public attention to environmental issues. "What concerns the public are the rising prices. A majority of the public opinion would not even know that there is a problem with the Dead Sea," which he attributes to the meagre attention given to the problem by the mass media. "Not enough importance is given to the issue by the government and the media," he concluded<sup>22</sup>. Yahya

Khaled, director of Royal Society for the Conservation of Nature, agrees and adds: "The media are weak and unable to investigate environmental issues." For example, there is mistrust towards the Red-Dead conveyer project because of inadequate information and public debate on the subject.

Although the media do cover major issues such as the nuclear plant and the Red-Dead conveyer, they seem to have difficulty looking beyond the information provided by the various ministries and officials, asking questions and engaging in debate. Batir Wardam, environmental expert and commentator, said that "there are no studies on alternatives to those huge projects"<sup>23</sup>.

The resignation of Hazem Malhas from his post as minister of environment, on 26 October 2010, highlights the tensions between the media and politics. The minister resigned after his insulting remarks on journalists and Jordanian media during a workshop were captured on video and broadcast on the internet. Although the minister's remarks were out of place, they triggered a debate on whether environmental reports too closely resembled the press releases issued by ministry offices, and how best to boost media capacity for investigative reporting of complex issues such as the environment and natural resources in Jordan and the Arab world.

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<sup>22</sup> Interview with Ahmad al-Kofahi, head of Jordan Environment Society, Aman, December 9, 2010.

<sup>23</sup> Interview with Batir Wardam, Environmental Expert, Amman, December 5, 2010.

# Changing climate

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By the first week of December 2010 the situation was growing critical, no rain having fallen on Jordan for many months. When the Ministry of Religious Endowments called for public prayers, thousands of people appeared in the main stadium of Amman and in major cities to pray salat al Istiqsa – a special prayer for rain<sup>24</sup>. Although the climate is undoubtedly changing – the UN projects a 20% decrease in rain for the Middle East and North Africa by the end of the century – there are different explanations for what is happening. In a press conference on 27 November Jamil Abu Bakr, the spokesperson of the Jordanian branch of the Muslim Brotherhood, linked the lack of rain to what he referred to as immoral behaviour on the beaches of the Dead Sea and at resorts in Aqaba, such as lightly dressed women advertising Jordan's tourist assets<sup>25</sup>.

Whatever the causes of climate change, the Middle East and North Africa will be seriously

affected. In fact the climate is already changing and Jordan has recorded a decrease in rainfall. According to Jordan's official report to the UN Framework Convention on Climate Change, "Decreasing trends in the annual precipitation by 5-20% in the majority of the stations are apparent evidence of climate change in Jordan during the last 45 years. But very few stations, such as Ruwaished in the extreme east and Ras Muneef in the northwest, experienced an increase in the annual rainfall amount by 5-10%"<sup>26</sup>.

Changing climate does not bode well for the Kingdom. The IPCC is projecting a 20% drop in rainfall in the southern Mediterranean by 2080-99<sup>27</sup>. According to a study by a group of scientists "by the end of this century, the Fertile Crescent will lose its current shape and may disappear altogether". It projects a "40% decrease in the annual streamflow of the Euphrates river" by 2050, and an up to 82% decrease of the Jordan<sup>28</sup>.

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<sup>24</sup> "Alf al-Muwatineen Yuayidun Salat al-Istifsa fi 'Amman wal-Mu'hafazat", (Arabic: T housands of Citizens perform al-Istifs Prayer in Amman and the Provinces), al-Ghad, December 2, 2010: <http://www.alghad.com/index.php?news=545276>

<sup>25</sup> Sa'ad Abu 'Ali, "Abu Baker: In'hibas al-Matar Natijat a-Ta'ari fi al-Bah'r al-Mayet wal 'Aqaba", (Arabic: Abu Baker: Lac of Rain is Result of Nakedness at Dead Sea and Aqaba), Assawsan, November 27, 2010: <http://assawsana.com/portal/NewsPrint.aspx?id=40633> 26

<sup>26</sup> Jordan's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) 2009, page 20.

<sup>27</sup> See Climate Change and Water, IPCC, 2007, page 25.

<sup>28</sup> Akio Kitoh, Akiyo Yatagai, and Pinhas Alpert, "First super-high-resolution model projection that the ancient "Fertile Crescent" will disappear in this century", Hydrological Research Letters 2, 1-4, 2008.

# Politics and environment

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Professor Musa Mohsen is impatient to see the Red-Dead conveyer take shape. “The project is vital to us, and we think that the project is not advancing fast enough,” he said<sup>29</sup>. Batir Wardam in his turn said that “the government presents the Red-Dead project as a magical solution to the water problem, while there is ideological opposition saying this is an Israeli project imposed on Jordan.” Wardam adds that part of the problem could be that “the project is opaque, no information about it is available”<sup>30</sup>.

On the other hand, there seems little public debate on the nuclear projects. Whereas there is great suspicion towards the Red-Dead Conveyer project, since many Jordanians think that the project will further link their country with Israel, there seems to be little opposition to the nuclear choices apart from some narrow environmental circles. “Some people support the nuclear project out of prestige,” according to Batir Wardam. Al-Kofahi said that his organization opposes the nuclear project due to environmental concerns. Jordan has a 26-kilometre coastline on the Gulf of Aqaba and building a nuclear plant there could entail high risks. But his NGO stopped its anti-nuclear campaign after Israeli authorities voiced their opposition to Jordan’s nuclear ambitions. The reaction of the Jordanian NGO is understandable: not only there is deep public scepticism in Jordan towards any contacts with Israel in spite

of the 1994 peace agreement – this comes as no surprise, more than half of Jordan’s population being refugees from Palestine or their children – but also there is a growing fear among the political elite that Israel may use environmental arguments as an excuse to block projects seen as contrary its own interests, including the Red-Dead and the nuclear projects.

But other voices say that before investing in such expensive projects Jordan needs to revise its current policies and stop water losses. Today the agricultural sector pays less than US\$0.01 per m<sup>3</sup> of water, whereas the Disi project will bring water to the Jordan water system at a cost of US\$ 1.5 per m<sup>3</sup>. Uncertain cost estimates for desalinated water from the Red-Dead conveyor are even higher. Jordan uses 65% of its available water for agriculture which contributes only 2.5% of GDP. So does the agri-food industry play an important part in Jordan’s food security? Experts say “no”. Local production has shifted to cash crops, such as tomatoes or bananas, exported to the Gulf or Lebanon. “In Jordan we have 45% losses in the water system,” said Munqith Mehyar, director of Friends of the Earth in Amman, “a USAID study shows that 80% of these losses are due to theft. The only way to solve this is by the involvement of His Majesty, inviting those great agro-business owners to the palace where they should be told that they are hurting the country,” he concluded<sup>31</sup>.

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<sup>29</sup> Interview with Dr. Mousa Mohsen, Amman, Professor December 4, 2010.

<sup>30</sup> Interview with Batir Wardam, Environmental Expert, Amman, December 5, 2010.

<sup>31</sup> Interview with Munqith Mehyar, head of Friends of the Earth in Jordan, Amman, December 9, 2010.

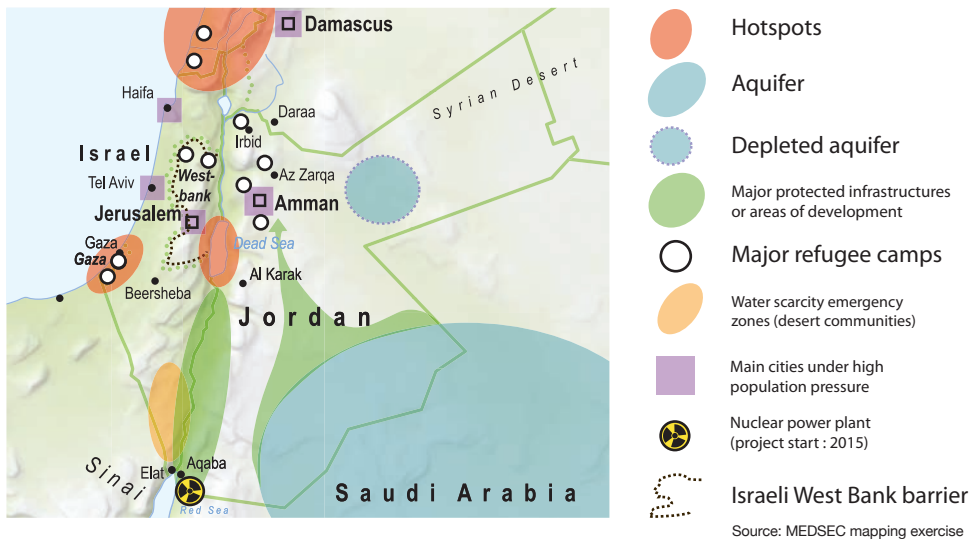
Environmental activists are calling for the regeneration of the Jordan river at a cost of US\$ 800 million, to cure the Dead Sea, rather than investing in a multi-billion engineering project which could have additional negative impacts on the Jordan valley ecosystem.

“We are not working on reduction of water and energy loss, which we need to do before we start thinking about mega projects,” said Fadi Sharaiha, executive director of the Royal Marine Conservation Society of Jordan<sup>32</sup>. Today the solution proposed by the Jordanian authorities to face the growing resource gap is enormous construction projects with huge capital investments. But are they the most appropriate answer to current problems?

In his study of the Jordan’s history Philip Robins made this assessment of the major construction projects fed by remittances from the Gulf countries in the 1970s: “Jordan would probably have been better served by being more circumspect in its investment decisions, and targeting them towards smaller, more viable labour-oriented activities, rather than such capital-intensive outlets”<sup>33</sup>.

In the words of Professor Nizar Abu Jaber: “There is no solution without sacrifices, there is no solution while we keep the current consumption patterns and resource depletion” before sounding the alarm: “Expectations are high while standards of living are declining which is creating hostility towards the authorities”<sup>34</sup>.

## Environment and Security issues of Jordan and neighbouring countries



<sup>32</sup> Interview with Fadi Sharaiha, Amman, December 8, 2010.

<sup>33</sup> Philip Robins, *A History of Jordan*, Cambridge University Press, 2004, page 145.

<sup>34</sup> Interview with Prof. Nizar Abu Jaber, Amman, December 5, 2010.



# Conclusion

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The water situation, much as for energy and food production, reveals the existential dilemma of Jordan. The country does not have enough water, and new energy sources are needed to pump water from the Disi aquifer to Amman and the Jordan valley in the north. To build the Red-Dead conveyor additional energy sources are needed. Jordanian planners are thinking about the nuclear option as a means of local energy production, but such a plant will need fresh water to cool up to four reactors and that water is not available. By locating the plant near Aqaba, where Jordan has a narrow shoreline of 26 kilometres, it would be possible to desalinate water (another energy-intensive undertaking) and use it to cool the nuclear reactors. Furthermore the country depends on foreign technology and capital to realize its ambitions to obtain new energy and water resources, regardless of whether such projects concern nuclear power or the Red-Dead conveyor.

Jordan may be an extreme case, and the falling level of the Dead Sea may be the most visible proof that we are consuming resources which are not renewable. But the whole of the Middle East and North Africa now faces similar

dilemmas. Jordan is indeed an extreme case, in that it lacks all three key necessities for human civilization: food, water and energy. Other countries in the region are fortunate in having hydrocarbon reserves, or at least better water resources and food production which can satisfy a bigger share of local needs. But Jordan has the advantage of having a relatively small population – although rapid demographic growth is undermining this advantage – whereas neighbouring countries with larger populations have bigger problems to address. Whatever the case of population size and natural resources, it is evident that in the near future the region will start running out of options. Reliance on non-renewable resources will reach its upper limit and become counterproductive. Under such circumstances radical debate on policy options is needed, looking not only at solutions through costly projects to increase supply, but also at the entire supply and demand of resources in order to provide long-term answers securing the well-being of future generations. As the example of Jordan reveals there are no short-term answers to these questions, nor yet within the boundaries of the nation-state. Regional cooperation is needed to maximize shared benefits.

By the first week of December 2010 the situation was growing critical, no rain having fallen on Jordan for many months. When the Ministry of Religious Endowments called for public prayers, thousands of people appeared in the main stadium of Amman and in major cities to pray salat al Istiqsa – a special prayer for rain. Although the climate is undoubtedly changing – the UN projects a 20% decrease in rain for the Middle East and North Africa by the end of the century – there are different explanations for what is happening. In a press conference on 27 November Jamil Abu Bakr, the spokesperson of the Jordanian branch of the Muslim Brotherhood, linked the lack of rain to what he referred to as immoral behaviour on the beaches of the Dead Sea and at resorts in Aqaba, such as lightly dressed women advertising Jordan's tourist assets.



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