Cost of Non-Cooperation on Water

Crisis of Survival in the Middle East

Strategic Foresight Group

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With support from

Swedish International Development Cooperation Agency (Sida)

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Foreword

In June 2010, the leaders of Jordan, Lebanon, Syria and Turkey met to launch a new era of cooperation in the Middle East. They also invited Iraq to join the grouping. In the second half of 2010, it appeared like elements of a future Middle East Union were being formed. They were mainly in two spheres: trade and transit, and water and environment. Obviously such a new era of cooperation was possible because of personal interest taken by the Heads of States. It saw its pinnacle in February 2011, when the leaders of Syria and Turkey came together to inaugurate the Friendship Dam.

Five and a half years later, in August 2016, we would have expected the process to mature into the formation of various cooperative institutions. Instead, it collapsed within weeks of the inauguration of the Friendship Dam amidst what was then called the Arab Spring, but what has proved to be the Arab nightmare. In particular, in Iraq and Syria, the institutions of state have collapsed. Social contract between the state and citizens has broken down. Farms, villages, cities have lost their economic drive. Millions of people have been forced to migrate either within the region or outside. The failure of the summer of 2011 to consolidate the elements of the new Middle East led to the refugee crisis of the summer of 2016, having an impact on Europe. It is logical to argue that the rise of some of the extremist right wing forces in Europe was thus a result of the refugee crisis which in in turn was on account of the collapse of government and cooperation in the Levant region.

Women, older people and children have suffered the most, as it always happens in crisis of this nature. Their plight was most dramatically symbolised by the photograph of an unfortunate child who died off the coast of Turkey while trying to migrate to Europe.

Behind the dramatic pictures, and emotional outpouring in various media, are hard facts of the cost of non-cooperation in the last 5 years. These facts provide evidence of the exact extent of the loss of crops, reduction in access to water, damage to infrastructure, impact on health and loss of livelihoods, and other realities of daily life. The purpose of this report is to provide the relevant facts and figures so that we don't lose the seriousness of debate in mere rhetoric and emotions. We believe that hard facts have also hidden in them hard options for possible solutions.

These facts should convince governments, civil society, international organisations in the Middle East and those outside concerned about the region to reflect on the great tragedy that we invited on ourselves exactly at a time when the region was moving towards cooperation. It is still possible to reverse the direction of events in the Middle East and move back to the spirit of 2010. It is indeed essential to build on what was achieved in 2010 to foster cooperation in water, food and environment so that the region can finally begin its journey from deep crisis to stability and from stability to an era of peace and prosperity.

Ilmas Futehally
Executive Director

Mumbai, August 2016

Strategic Foresight Group

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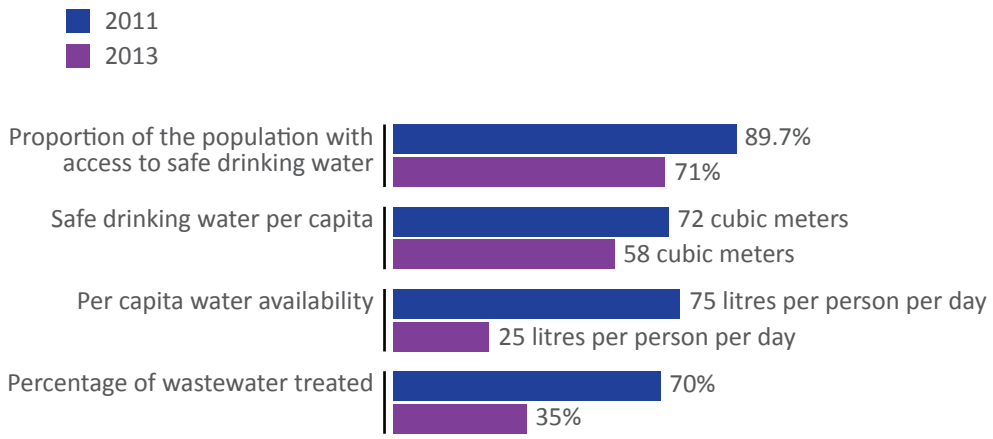
CHAPTER I

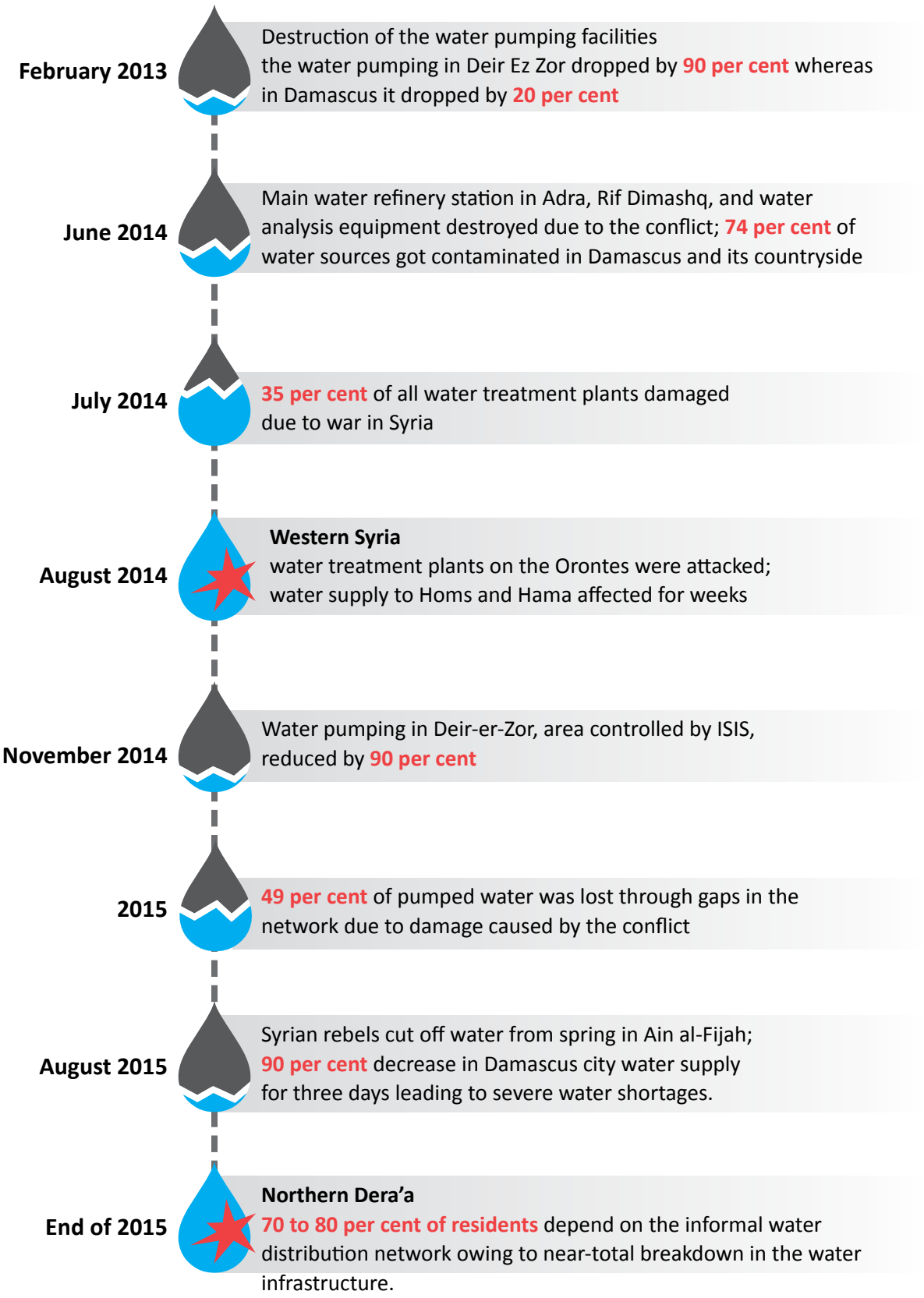
Water Infrastructure Damage

During the conflict in the Middle East, water resources have been used as a target and weapon of war and also as a part of expansion strategy in order to further political and military aims. However, the water infrastructure and the populations dependent on them suffer a great deal due to the resultant damage.

Syria

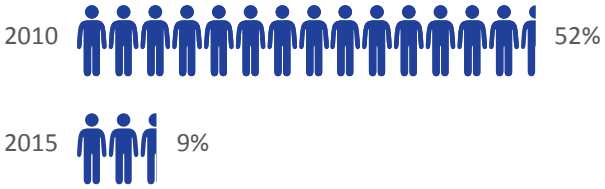
The decreased water availability in Syria due to destruction of water infrastructure:




February 2013
Destruction of the water pumping facilities
the water pumping in Deir Ez Zor dropped by 90 per cent whereas
in Damascus it dropped by 20 per cent
June 2014
Main water refinery station in Adra, Rif Dimashq, and water
analysis equipment destroyed due to the conflict; 74 per cent of
water sources got contaminated in Damascus and its countryside
July 2014
35 per cent of all water treatment plants damaged
due to war in Syria
August 2014
Western Syria
water treatment plants on the Orontes were attacked;
water supply to Homs and Hama affected for weeks
November 2014
Water pumping in Deir-er-Zor, area controlled by ISIS,
reduced by 90 per cent
2015
49 per cent of pumped water was lost through gaps in the
network due to damage caused by the conflict
August 2015
Syrian rebels cut off water from spring in Ain al-Fijah;
90 per cent decrease in Damascus city water supply
for three days leading to severe water shortages.
End of 2015
Northern Dera'a
70 to 80 per cent of residents depend on the informal water
distribution network owing to near-total breakdown in the water
infrastructure.

Access to improved sanitation facilities

The proportion of population benefitting from wastewater treatment



January - March 2016

70 per cent

Children without access to reliable water supply

66 per cent

Untreated sewage

12.1 million people

Lack access to water, sanitation and waste disposal

Aleppo

October 2014

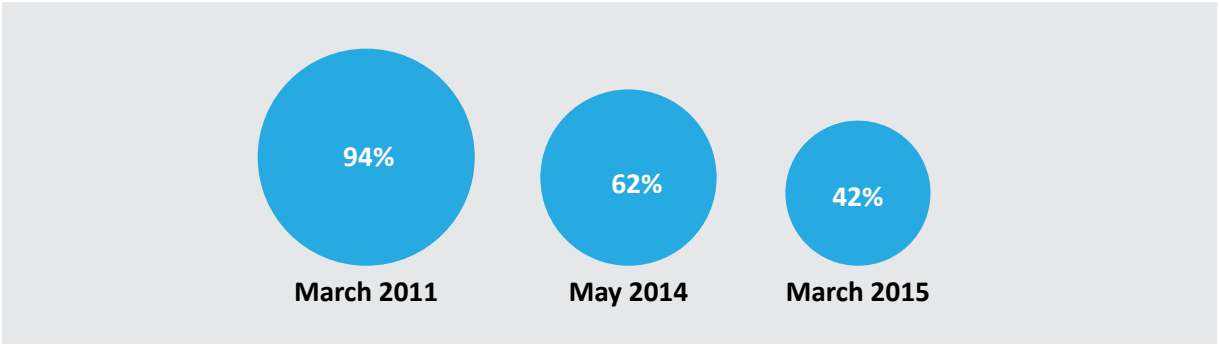
20-30 percent of eastern Aleppo's water infrastructure damaged or destroyed

Summer 2015

40 deliberate water-cuts in Aleppo city by the opposition groups;
1.5 million people deprived of running water; longest cut lasted for 2 weeks.

Eastern Aleppo

Access to drinking water primarily from the municipal network via in home pipelines



June 2015
an explosion destroyed three out of four major pipes used for pumping water from the Sulaiman al-Halabi station and also cut power cables required to feed the water pump

July 2015
the Al Nusra Front cut off water for three weeks by exploiting their control of the Sulaiman al-Halabi pumping station in Aleppo to pressure the government to regulate the electricity flow

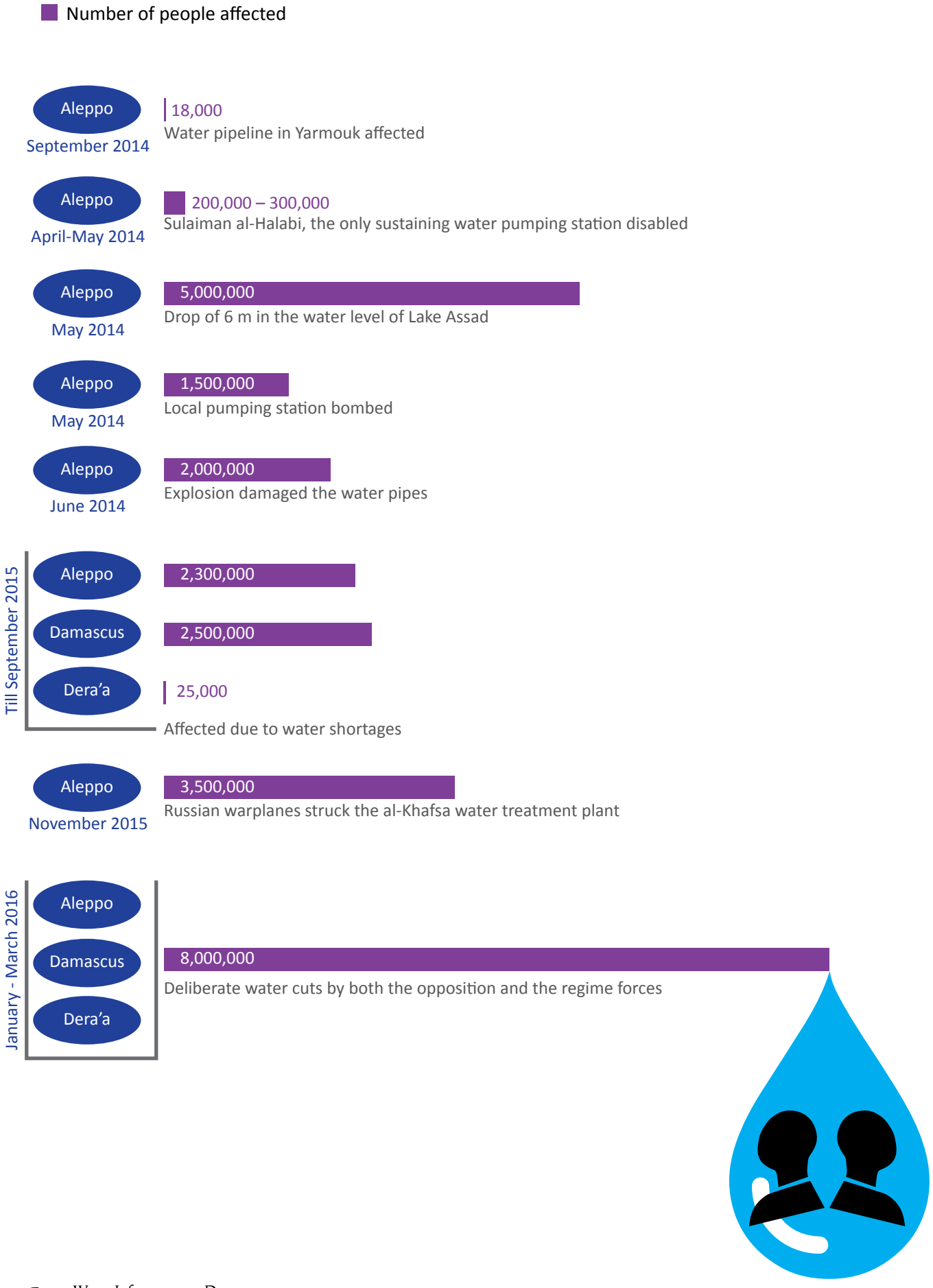
August 2015
the water availability was about 50 per cent less than it was before the conflict began

November 2015
pumping was partially restored later after the attack on al-Khafsa, but 1.4 million people in rural Aleppo still suffered from water shortages

November 2015
US-led Air raids hit water pumping stations in Aleppo

January 2016
the residents suffered 48 days of deliberate water cut which only resumed early March 2016

People Affected by Damage to Water Infrastructure in Syria



Iraq

July 1981

70 per cent of all transformers of a hydroelectric station were destroyed by Iran; blackouts in Kurdistan in Iraq.

2003 American Invasion

40 per cent of Baghdad's total water infrastructure and **80 per cent** of water piping network damaged in the aftermath of intermittent wars

July 2003

Estimated **500,000 tons** of untreated sewage pumped into Tigris daily because a quarter of 177 water treatment plants were not working.

2011

1 in 5 households in Iraq used unsafe drinking water source.

2011

only **43 per cent** of the rural population had access to clean drinking water.

2012

7 million residents of Baghdad suffered clean drinking water shortages

70 per cent of the 'Qanats' in Iraq

the ancient water canals, predominantly in Kurdish governorates dried up due to drought and faced destruction during the conflict.

Gaza

Of all the parts of the Middle East, Gaza has undoubtedly suffered the longest due to wars and their consecutive destructive effects on the water infrastructure. Three wars in the Gaza Strip in just six years (2008-2014) have left the already stretched infrastructure degraded even further.

Continued destruction of key infrastructure has left **1.4 million people** in Gaza with some or **no access** at all to **water and sanitation services** (as of September 2014).

Even before the wars, the water infrastructure in Gaza worked at only **56.6 per cent** of efficiency.

US$1 billion | **cost of overhauling Gaza's water system**

The three military operations by Israel on Gaza have severely damaged the key water infrastructure in Gaza in numbers:

THREE WARS

84 days of total fighting

- Operation Cast Lead (27 December 2008 to 18 January 2009)
- Operation Pillar of Defence (14 November to 21 November 2012)
- Operation Protective Edge (8 July to 26 August 2014)

US$ 70 million

Total damage to water infrastructure

900,000 to 1.5 million

People impacted in Gaza

Operation Cast Lead (27 December 2008 to 18 January 2009)

Water Infrastructure Damage

More than **30 km** of water networks

11 groundwater wells

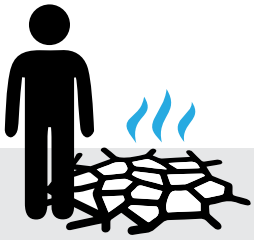
840 household connections

6000 roof tanks

Water & Sanitation Infrastructure Damage

US$ 6 million

Population in Gaza without access to Water

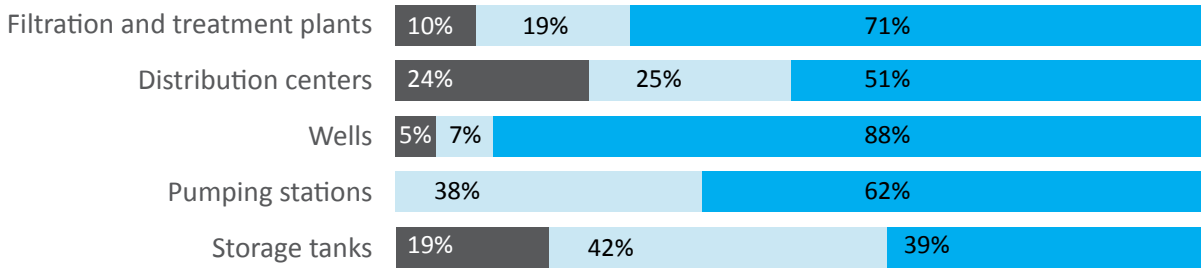


One-third of the people

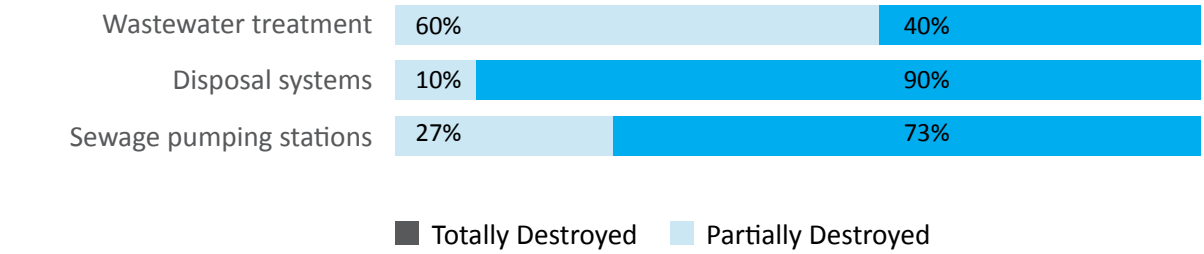
Operation Protective Edge (8 July to 26 August 2014)

The losses in water infrastructure alone	Infrastructure damage and / or low water pressure affecting the municipal water supply	Percentage of wells destroyed or damaged, particularly in Gaza City, Beit Hanoun, and Deir al Balah municipalities
US$ 34 million	**450,000 people affected**	**12 per cent**

Water Supply Damage



Wastewater Services



Coastal Aquifer

96 per cent unfit for human consumption:

- Rapid population growth

- Continued destruction of water treatment plants

- Seawater intrusion

- Seepage of sewage water (about 70 to 100 million litres of sewage per day flowed through the streets after the Operation Cast Lead and Operation Pillar of Defence.)

- Over pumping

- Lack of construction material required for damage repair

- Israeli blockade

As a result, only 4 per cent domestic water supply is fit for human consumption.

Chloride content of the wells in Gaza near the coast

2000 milligrams per litre

250 milligrams per litre - maximum chloride content acceptable by WHO

Nitrate content of the wells in Gaza

Out of 211 wells administered by the Palestinian Water Authority,
87 per cent of the wells

have over 200 milligrams per litre

50 milligrams per litre - maximum nitrate content acceptable by WHO

2011

Deprived of their water source, West Bank residents dependent on tanker **water paid** up to **400 per cent more** per litre than those directly connected to the water network.

Communities without access to water infrastructure

daily water consumption dips to **20 litres per person** per day in West Bank
one fifth of amount of water **recommended by WHO**

90 per cent of the population

buys desalinated drinking water

September 2015

Egypt flooded the tunnels under the city of Rafah with sea-water; polluted the underground drinking water reserves; flooding can threaten the housing foundations and also endanger the agricultural land near the frontier; **6 wells** providing water to **230,000 residents** threatened with **contamination**

Lebanon (2006 Israel-Lebanon War)

The preliminary **cost of destruction of water** infrastructure = **US$ 80 million**

Water and sanitation systems **destroyed** in **42 out of 70 villages** in the southern city of Tyre

Severe damage of **irrigation channel**, **Litani canal** and **electric power plants**

Turkey

Since 1984
the construction of the Ataturk dam disrupted several times by PKK attacks;
1100 vehicles and parts of working machinery destroyed

2010-2012
Three attacks on the Silvan dam from 2010 to 2012

Since August 2014
The PKK has launched attacks on cement trucks, bombed power-lines and kidnapped workers working on two of Turkey's biggest dams – Ilisu Dam and Silvan Dam. These attacks have resulted in companies suspending their work on the project, in turn delaying the completion of the projects

April 2015
Earlier in the year in April, PKK had attacked military convoy carrying construction equipment to the Silvan dam site

In August 2015
a young boy was killed in an attack by PKK on the construction site of Silvan dam in Diyarbakir and another was severely injured

Severe impact on investment and growth in the region

CHAPTER 2

Incomplete Water Infrastructure Projects

Over the years a number of projects for transferring water from to water stressed areas have been discussed and debated. A few have gone beyond plans on paper, but have not yet been completed.

The Peace Water Pipeline

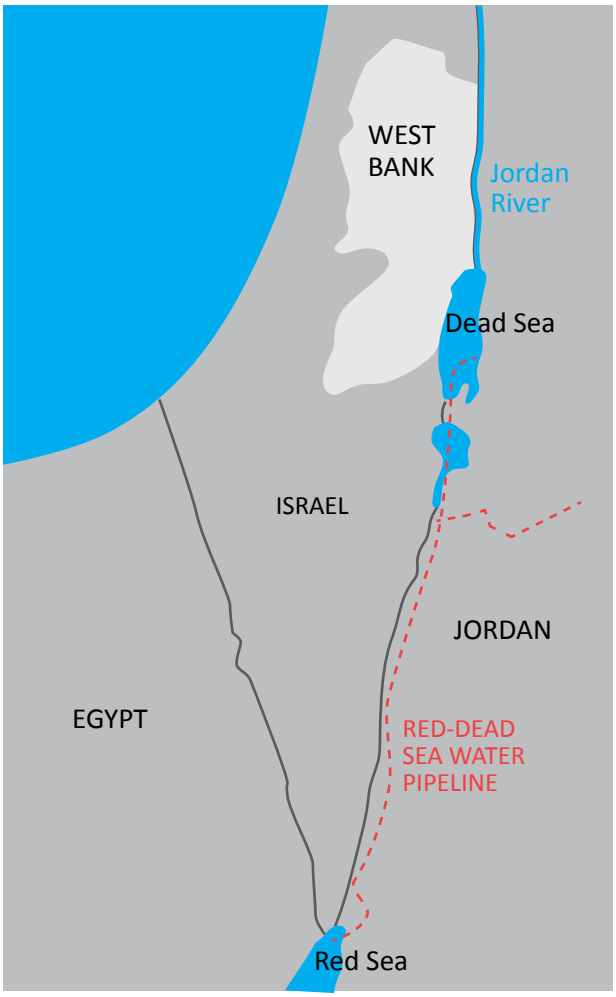
(Turkey, Syria, Jordan, Palestine and Gulf States)

At its inception, the estimated cost of the project was **$21 billion** in **1986**. However, nothing concrete has been done as yet.

The Red-Dead Sea Project

(Israel – Jordan)

The estimated cost of this project in **2015** was around **$900 million** over a period of three years.



The Friendship Dam

(Turkey – Syria)

In **2012**, the estimated cost of the dam was **$28.5 million**.

Water from the Nile to Israel

There are several projects of transporting waters from the Nile to Israel. The Sadat Peace Lake was finished in 1998 when it reached the Sinai underneath the Suez Canal. Its water has still not reached Israel because of the unsolved Arab-Israeli conflict. The Egyptian authorities fear a public uprising if the water reaches Israel before there are peace treaties between all Arab countries and Israel and until Israel has withdrawn from the Arab territories occupied in 1967 and implemented UN resolutions 242 and 338.

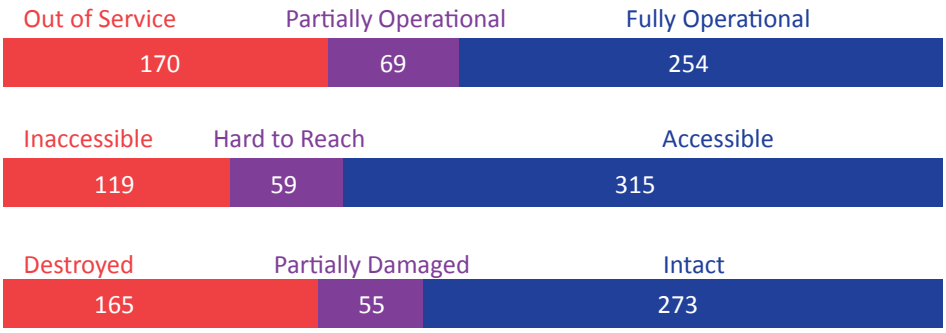
CHAPTER 3

Impact on Healthcare

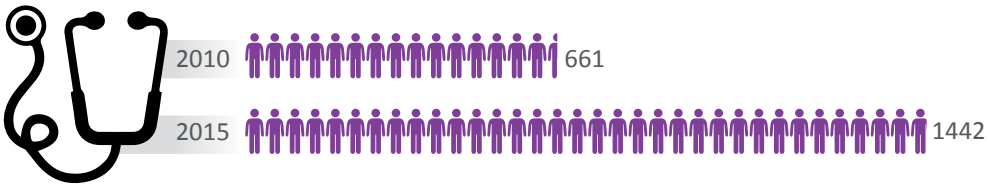
In addition, to the damage to water and sanitation infrastructure caused by civil strife, rampant droughts of the past decades have worsened the public health situation in the Middle East, with serious long-term consequences.

Syria

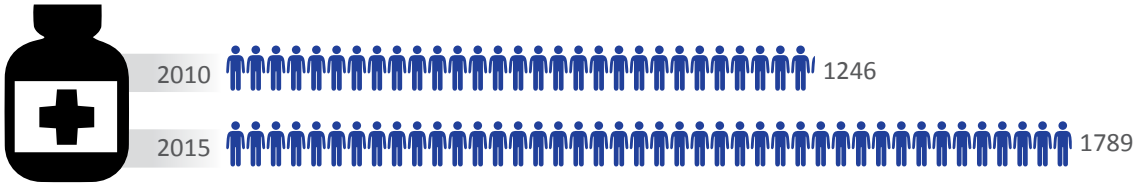
Status of Functionality of 493 Public and Private Hospitals as of early 2016



Number of People per Doctor



Number of People per Pharmacist



Spread of Water-borne Diseases

Number of cases of **Acute Diarrhoea** recorded as a result of polluted water resources:
200,000 more cases in just **2 years**.

Between 2012 & the first half of 2013 ——— more than **276,000**
Between 2009 & 2010 ——— around **76,000**

August 2014 — **36** **Poliomyelitis*** — after 15 years of eradication

Beginning 2015 — **105,886** **Acute Diarrhoea**

February 2015 — **50** **Hepatitis A** — Damascus city drinking water supply was threatened due to the Hepatitis A spreading through the Wadi Barada area

July 2015 — **1144** **Typhoid** — in Deir-er-Zor, raw sewage severely contaminated the Euphrates, the main source of drinking of the locals

** The Poliomyelitis virus lives in sewage, water and contaminated foods. The rampant destruction of water treatment plants and the resulting dumping of raw sewage directly into the Euphrates along with the halt of chlorination process since 2012, have contributed to the spread of water borne diseases in Syria.*

Iraq

From **1994 to 1999**

49.8 per cent of **infant deaths** were caused due to **diarrhoea**

From **2005 to 2010**

4,697 cholera cases, **36,208 typhoid** cases along with **548,204 gastrointestinal** cases

2011

350 diarrhoea deaths were recorded.

2014

Iraqis suffered **14 to 18 times** a year from **diarrhoea**

2015

a **cholera outbreak** was thought to have been caused due to pollution and low levels of water in the Euphrates.

2014

the **first case** of **poliomyelitis** was reported, after a **hiatus of 14 years** as a result of migration and water shortages with the lack of water treatment

2010, **water pollution** increased considerably

Biochemical Oxygen Demand (BOD) representing the degree of water pollution by organic material

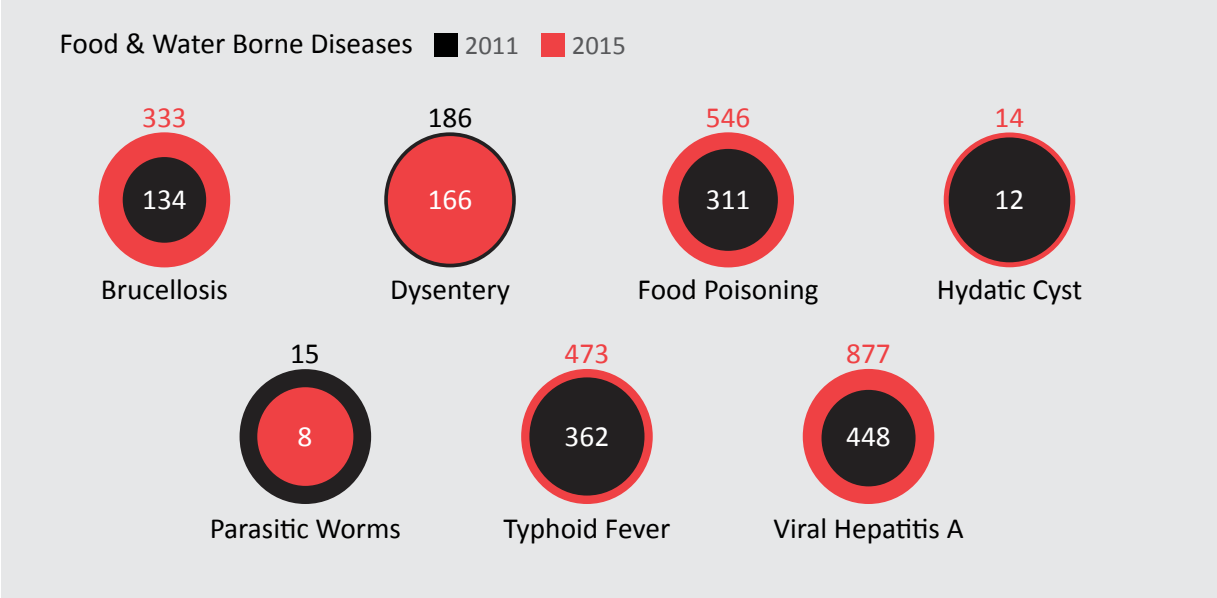
2010	**36.2** milligram / Litre
2005	between 1.04 - **12.12** milligram / Litre
Accepted national limit	**10** milligram / Litre

Total Dissolved Salts (TDS) in the Euphrates

1980s	**457** parts per million (ppm)
2009	**1200** ppm
Acceptable WHO limit	**500** ppm

Lebanon

Reported cases of food and water-borne diseases in Lebanon



Gaza

Three Israeli operations

affected the health infrastructure adding to the plight of the residents of Gaza

2014

before the Operation Protective Edge,
32 hospitals serving Gaza

2014

after the Operation Protective Edge,
51 per cent of all major **hospitals damaged**
27 per cent of the **hospitals closed** due to damage or insecurity
24 out of 97 primary **health care centres** were **closed**

CHAPTER 4

Impact of Destruction and Drought on Agriculture

The costs of conflict to the agriculture sector are manifold. The apparent loss in production occurred due to drought and irregular water and electricity supply, mainly in Iraq and Syria. The civil strife in Syria and Gaza has taken its toll on water and irrigation infrastructure directly impacting the production. With decreased agricultural production, the food imports are on the rise in the region – a direct impact on food security and food prices. The loss of arable land has caused the farmers to move to the urban centres, which are already under tremendous pressure.

Syria

Lack of water, drastic erosion of livelihoods
1.3 million Syrians affected
803,000 people **lost** all of their **livelihoods**
income fell by 90 per cent

Lack of water, scarcity of pasture and fodder
livestock owners with medium to small sized herd
lost **80 per cent** of their **herds**

Estimated livestock in Syria
2010 - **14 -16** million
2006 - around **21** million

Drought and Agriculture

2006 - 2013 — **60 per cent** of the Syrian territory suffered from **drought**

Since 2007 — The **agriculture** output fell by **50 per cent**

By 2010 — More than **75 per cent** of Syria's **agriculture** sector suffered
47 per cent drop in **wheat** yields
67 per cent drop in **barley** yields

Reported Number of Wells

From 2002-2008

All **420,000** illegal wells in Syria went dry, which halved water resources and led to a drop in grain output. As a result, **250,000 farmers** were forced to **abandon their land**

Since 2011

45 per cent of farmers could **fully harvest** their land, while **14 per cent** could **not harvest** at all due to insecurity and lack of fuel

2010 – 2015

Nearly **60 per cent** **decline** in **farming GDP**

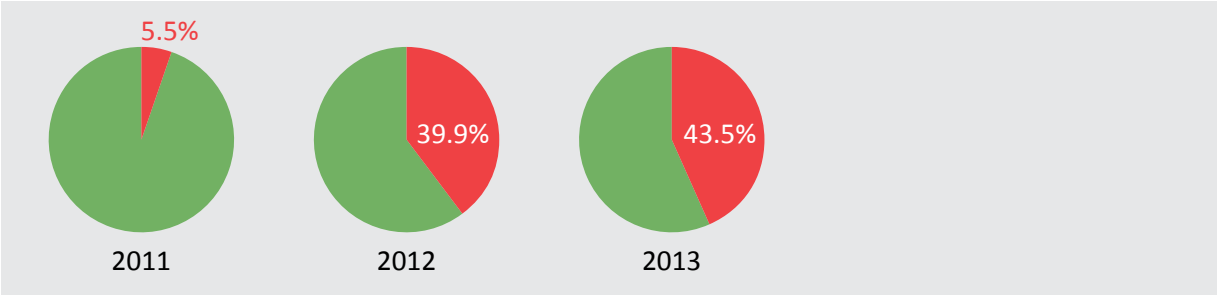
2010 – 2015

Total area of cultivation from **6 million hectares** to **3.6 million hectares**

Food Insecurity

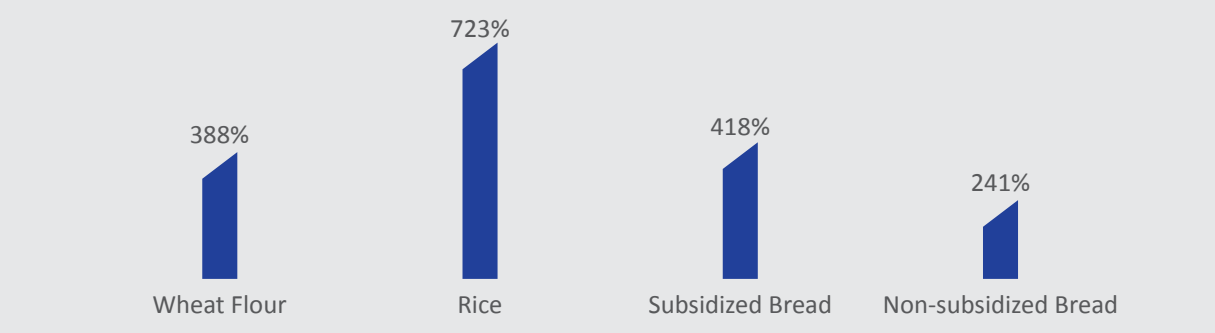
The ongoing conflict and droughts have made **8.7 million** Syrians food insecure
1 in 3 Syrians – **6.3 million** Syrians are food insecure
2.4 million Syrians at a **very high risk** of food insecurity.

Production Losses in Agriculture in Percentage

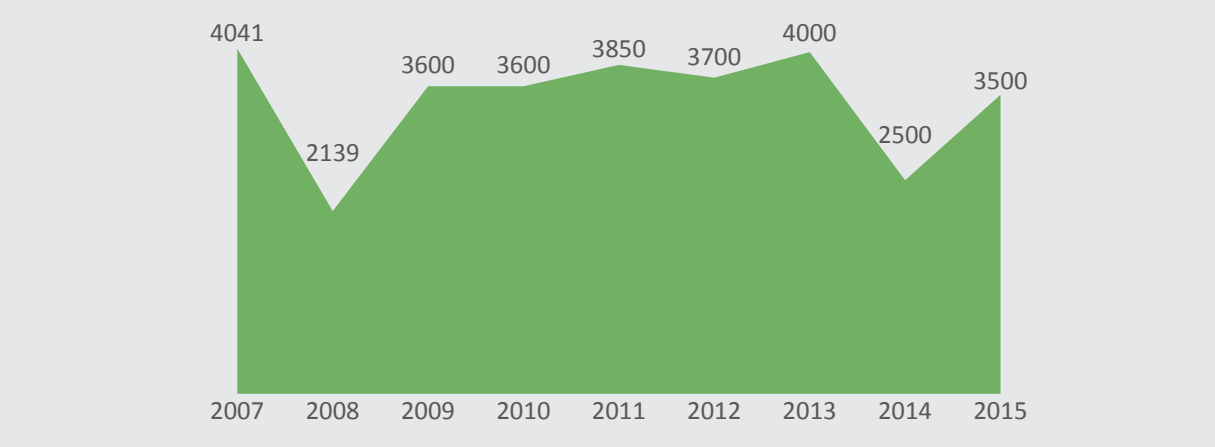


November 2014 – November 2015
Food Prices increased on average by **62.1 per cent**
Regional variations
Damascus → **46.5 per cent**
Deir ez Zor → **978 per cent**

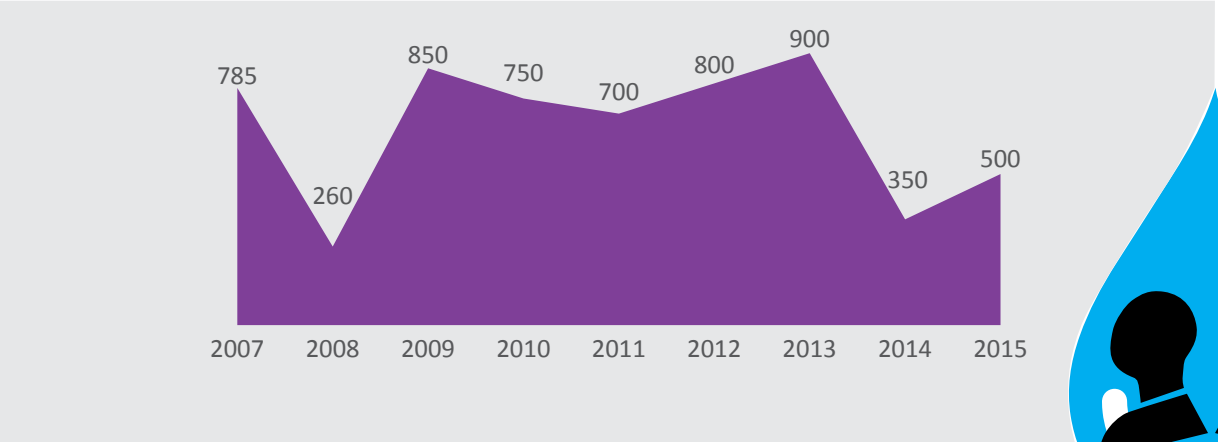
Basic Food Price Inflation
March 2011 – November 2015



Wheat Production Per Year (Production in 1000 MT)



Barley Production Per Year (Production in 1000 MT)



Iraq

2007 – 2009 drought

damaged 40% of the cropland in Iraq, especially in the northern governorates

By **2011** in northern Iraq, **water shortages**

95 per cent decrease in **barley and wheat** farming
73 per cent decrease in **Date palms**

2011

Mosul Dam **water levels low**,
the **electricity production stopped** completely for the first time since 1984

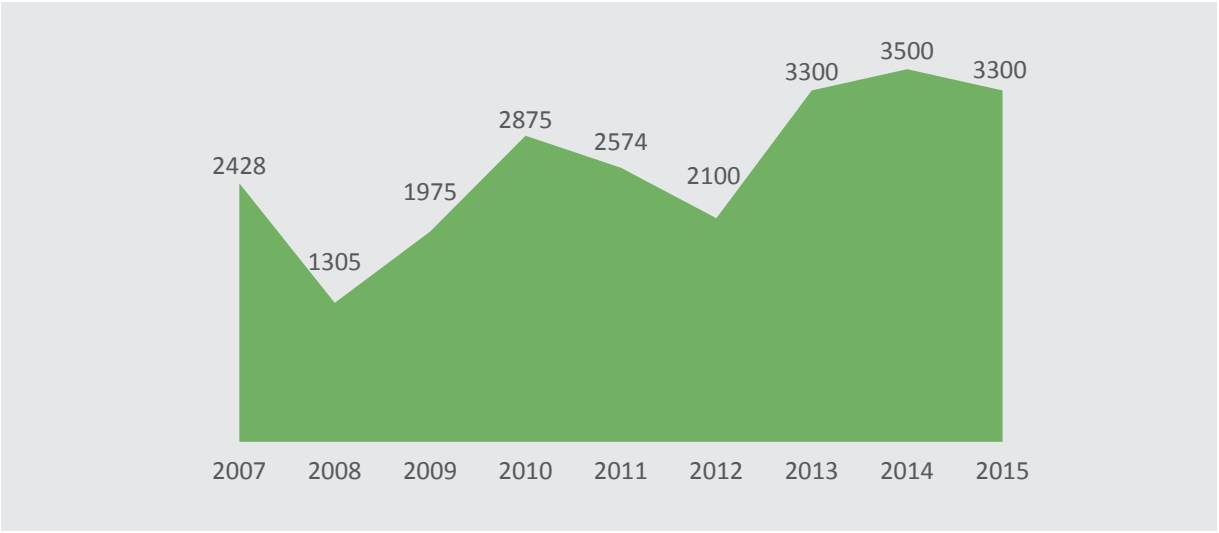
April 2014

Falluja Dam **floodgates closed** by ISIS between Falluja and Abu Ghraib
200 square kilometres of **fertile farmland** were **destroyed**;
almost the entire harvest was wiped out, and **livestock** was **killed**

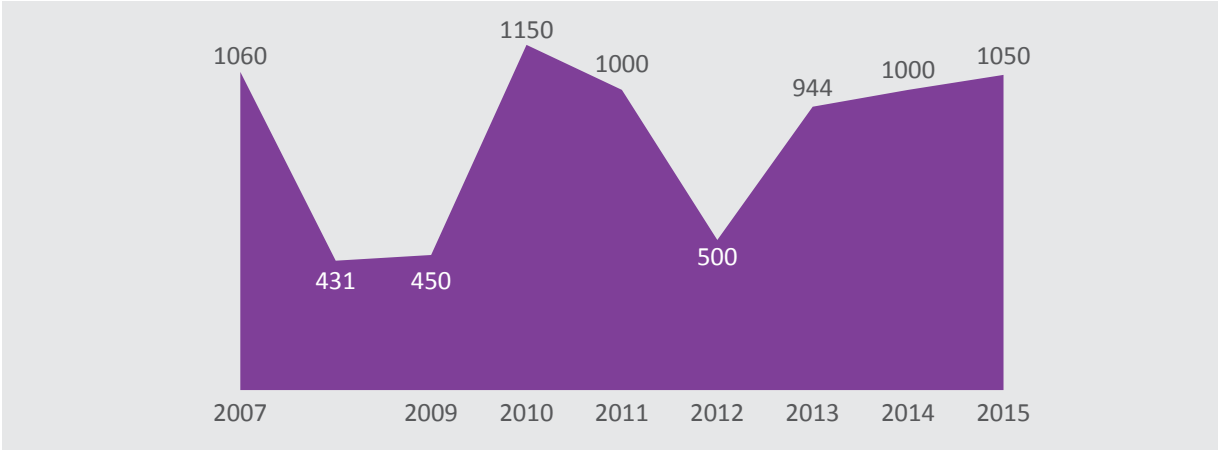
October 2014

ISIS **flooded** over **3 square kilometres** of **agricultural land**,
parts of the town of Mansouriya in Diyala province by diverting the Khalis tributary of the Tigris

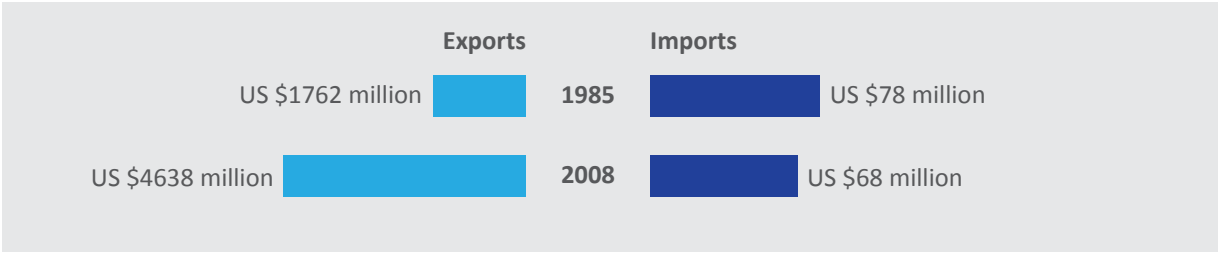
Wheat Production (Production in 1000 MT)



Barley Production (Production in 1000 MT)



Agricultural Exports and Imports

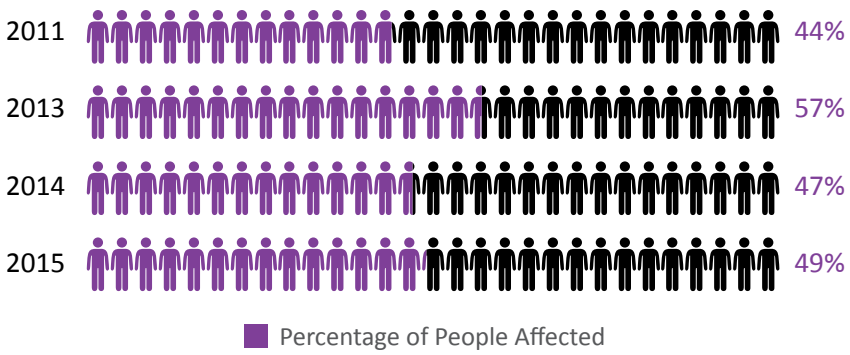


Gaza

Land and sea restrictions affect **178,000 people, 12 per cent** of the population in Gaza result in annual estimated **losses of US$ 76.7 million** from **agricultural production and fishing**

If the Area C residents in West Bank are allowed to **develop business and farms** **US$ 3.4 billion increase** in **Palestinian GDP** can be achieved.

Decreased purchasing power and agricultural output have resulted in the increase of food insecurity in Gaza



Gaza agriculture 2005-2013

> The occupied border zone swallows up some 17 per cent of Gaza's landmass, where **305 agricultural wells were destroyed**
>
> Due to lack of regular clean water supply, only **6.8 per cent of agricultural land was being irrigated** and equally low yields bring in only half of the agricultural produce in Occupied Palestinian Territory
>
> Estimates have put this **loss of economic gain at $1.44 billion annually**

Impact of Israeli Operations on Gaza Agriculture as
The two operations (77-day long constant fighting), 231 sq. km of cropland destroyed

Operation Cast Lead (27 December 2008 to 18 January 2009)

80	Percentage of all agricultural infrastructure and crops destroyed
35,750	Number of cattle, sheep, and goats killed
over 1 million	Number of chickens and other birds killed
13,000	Number of families dependent on agriculture, fishing, or herding whose livelihoods were damaged significantly
US$ 268 million	Estimated losses to agriculture community
US$ 180 million	Direct damages to the sector

Operation Protective Edge (8 July to 26 August 2014)

US$ 10 million	Losses to poultry sector
2 million	Chickens killed

Lebanon (2006 Israel-Lebanon War)

Cost to agriculture, fisheries and forestry in Lebanon

$ 280 million

2014-2015

the effects of drought **reduced** agricultural exports by **4.3 percent**, whilst profit margins for farmers within Lebanon were further slashed with **yields** on rain-fed crops **dropped** by as much as **50 percent**

Turkey

2007 : Impact of Drought in Turkey

Corn

-4.5 per cent Production setback

6.5 - 34.7 per cent Increase in prices

Jordan

1999-2000

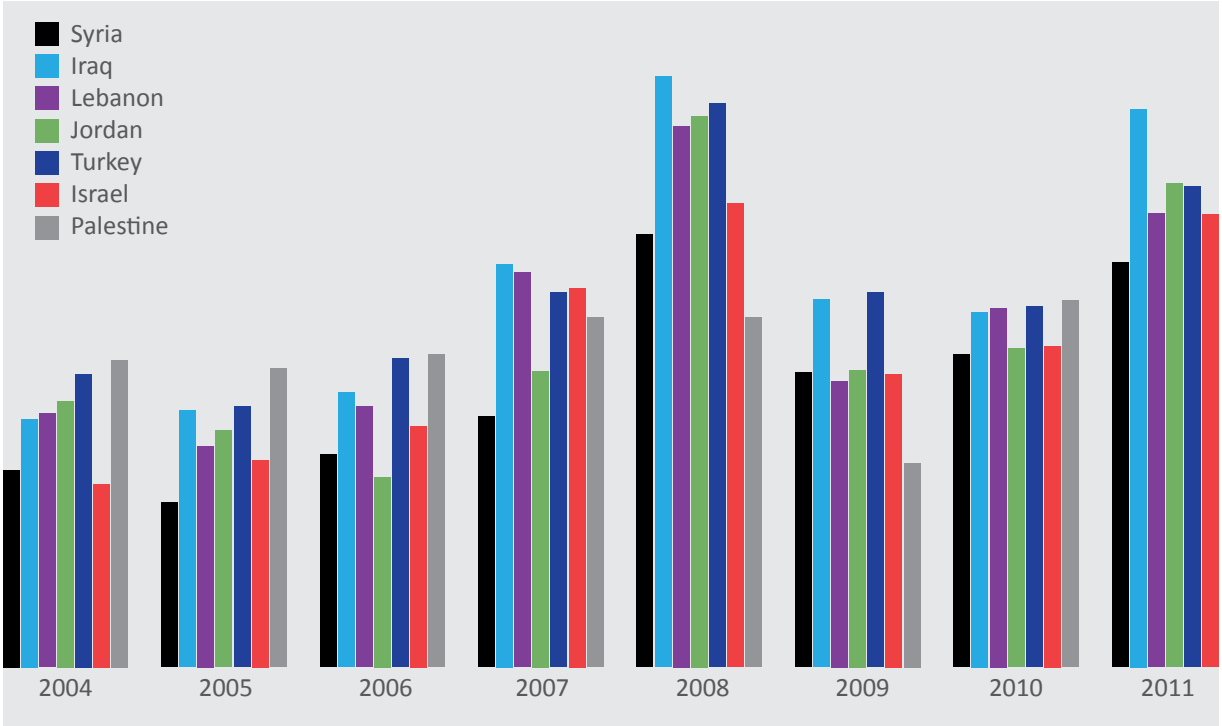
Extremely low cereal production
could not even cover the needs of 1 per cent of the population
90 per cent decrease in wheat production

2012

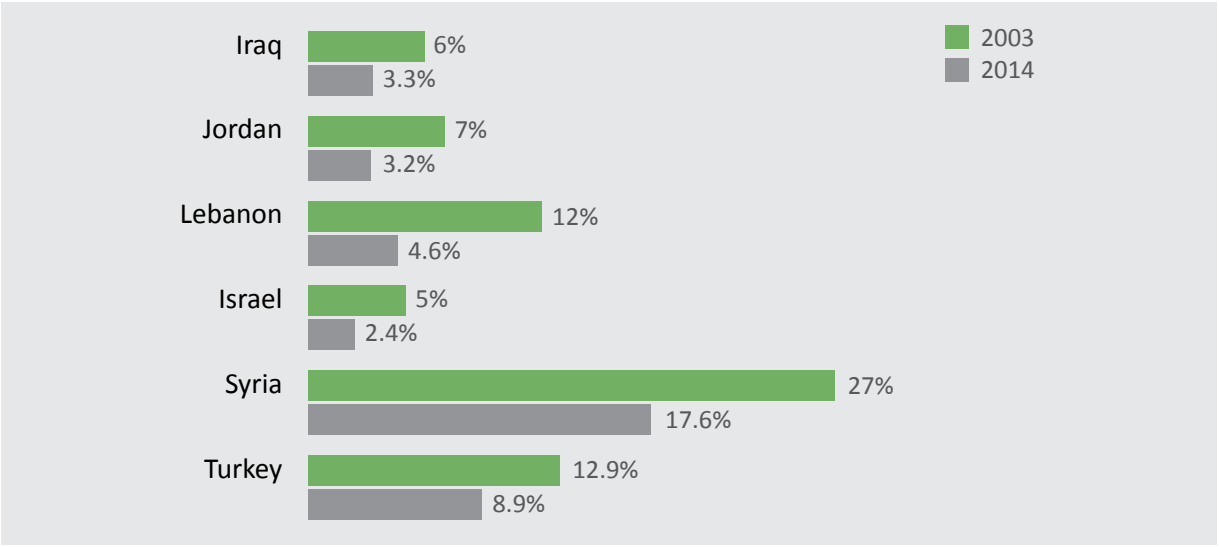
USD 30 million
cost to Jordanian agriculture due to the Syrian conflict

Agriculture in the Middle East

Regional Wheat Imports (unit value US $/tonne)



Decreasing Share of Agriculture in GDP in the Middle East due to Drought and Conflicts

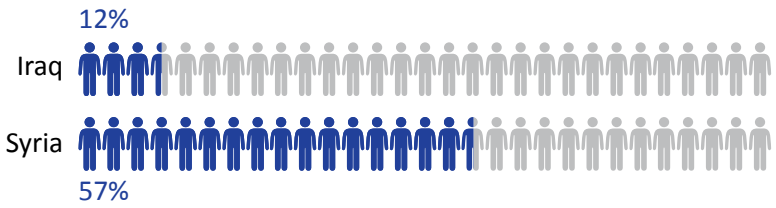


CHAPTER 5

Human Costs - Forced Migrations and Water Refugees

The term water-refugees is accorded to people who were displaced as the direct result of droughts, climate change, poor water management and imbalance of population/resource ratio.

Water refugees in percentage of the displaced population



Iraq

Since 2005

Water shortages have prompted **100,000 Iraqis to move** from their native communities since 2005 (UNESCO Report)

Between December 2007 and June 2009

4,263 families (25,578 individuals) were displaced due to drought, with more than 80 per cent from Nineveh governorate.

The trend was **highest in Muthanna (92 per cent)** followed by Thi Qar though the largest numbers of IDPs have been in Nineveh.

In 2009, **300,000 people were displaced**

due to the damage to the marshes and **prolonged drought** in the southern Iraq

As the **drought** struck again in 2012

10 million people in the Shatt-al-Arab region were put at a **risk**

In April 2014, **Fallujah Dam floodgates closed by ISIS**

inundated extensive areas up to 100 km away, and put the town of Abu Ghraib under up to **4 metres of water**

Up to **60,000 locals** who had **lost their livelihood** in the flood were displaced

October 2014

ISIS flooded as many as **9 villages** in the Shirwain area by diverting water to halt the advance of Iraqi military troops

200 acres (about 1 sq. Km) of land and **60 houses submerged**

ISIS targets minorities and non-Sunni populations by using water as a weapon

July 2014, **ISIS cut the water supply** to Qaraqosh in Kurdistan,
a city dominated by Christians and Shias

October 2014, **ISIS cut off water** from Sudur dam to Balad Ruz,
a predominantly Shia area in Diyala province

In October 2014, **ISIS flooded** parts of the town of Mansouriya in Diyala province

hundreds of families were forced to **flee**

The **water supply** from Khalis River was **cut for 10 days** which interrupted the drinking water supply in the towns of Mansouriya, Salam and Sarajiq.

May 2015

after seizing the Ramadi Dam, **ISIS reduced the outflow** of the Euphrates by up to **50 percent** as it diverted water into Lake Habbaniya.

In addition to its own displaced people, Iraq hosts **245,022 Syrian refugees** as of May 2016

adding **pressure** to the **weakened water resources**

Syria

Drought in Syria and its effects on population

2007-2008 drought
herders sold their livestock for **60 to 70 per cent below their normal prices**

59,000 small herders **lost all of their livestock**

47,000 small herders **lost half of their livestock**

Overall **1.3 million people** directly **impacted**

More than **160 villages** **abandoned**

65,000 rural families forced to **migrate to urban slums**

1.5 million people forced to **move to overburdened Syrian cities** from the rural areas due to declining water availability and prolonged mismanagement of water resources

Since March 2011,
4.5 million people have fled the country and 6.5 million are internally displaced
mainly because of severe damage to the water infrastructure and prolonged droughts combined with the conflict.

Water Pricing

USD 5 per month	Between **USD 2 to 10 per litre**, provided by water tankers
Before 2011	End of 2015

Jordan

During **1999-2000 drought**
most of the rural populations and small farmers numbering **180,000 were affected**
4.75 million people faced **food insecurity**

As of February 2016,
637,859 registered Syrian refugees in Jordan

More than **80 per cent refugees**
live in host communities rather than in the refugee camps

Since the arrival of Syrian refugees in Jordan
water consumption per capita dropped from **88 to 66 litres**

Lebanon

2006 Israel-Lebanon war
1.7 million people in south Lebanon suffered temporary or full stoppage of water supply

2007-2008
In the Beqaa valley in Lebanon, the drought directly affected 11,000 people

As of May 2016
1.5 million Syrian refugees in Lebanon

In Lebanon a water balance that should have been negative in 2030 was negative in 2015

With influx Syrian refugees, Lebanon's population increased by 30 per cent
rise in the domestic water demand by 12 per cent over 2 years

CHAPTER 6

Notable Events in Middle Eastern Conflicts Involving Water

16 January 2016	Aleppo, Syria	Al-Khafsa water treatment plant shut down deliberately affecting over 2 million people in Aleppo governorate and forcing them to depend on unsafe and insufficient ground water
January 2016	Iraq	Iraqi troops retook the Ramadi barrage
December 2015	Syria	Syrian Rebels and Kurds retook the Tishrin dam from ISIS
November 2015	Aleppo, Syria	The Russian warplanes struck the al-Khafsa water treatment plant in the Islamic State (IS)-held eastern Aleppo countryside. 3 million people were affected
August 2015	Syria	Syrian rebels cut off water from spring in Ain al-Fijah which resulted in 90 percent decrease in Damascus city water supply for three days
August 2015	Turkey	PKK attacked the construction site of Silvan dam
July 2015	Damascus, Syria	Wadi Barada Shura Council militants threatened to cut off water from the Ain al-Fijah spring, which supplies drinking water to Damascus

June 2015	Syria	An explosion destroyed three out of four major pipes used for pumping water from the Sulaiman al-Halabi station and also cut power cables required to feed the water pump
June 2015	Iraq	ISIS closed the gates of Ramadi and other dams and reduced Euphrates' flow by 50 percent
June 2015	Aleppo, Syria	Jabhat Al Nusra bombed the main pipeline carrying water from the Euphrates to Aleppo that led to severe water contamination. Around 100 people were poisoned.
March 2015	Iraq	ISIS Captured Ramadi Barrage
February 2015	Damascus, Syria	Due to water contamination, Damascus city drinking water supply was threatened with spread of Hepatitis A and typhoid
December 2014	Iraq	ISIS deliberately contaminated drinking water with crude oil in the Balad district of Salahaddin Governorate, south of Tikrit
November 2014	Homs, Syria	IS attacks Homs (Qattinah lake, Orontes)
November 2014	Idlib, Syria	Jabhat al Nusra takes Idlib (Orontes, next to Lattakia, sea)
October 2014	Iraq	Samarra barrage flooding plan of IS thwarted by Iraqi army
October 2014	Iraq	IS diverts the Khalis tributary of the Tigris, flooding the parts of Mansouriya in Diayala province
Second half of 2014	Turkey	PKK attacks hydroelectric plants and dams in eastern and southeastern Turkey
September 2014	Syria, Iraq	Chlorine from water treatment plants used as weapon
August 2014	Rakka, Syria	Airstrikes by government hit city water plant
August 2014	Nineveh, Iraq	IS gained and lost control on Mosul dam
August 2014	Qaraqosh, Iraq	Water cut off by IS to minority town
July 2014	Syria	35% of water treatment plants damaged
July 2014	Deir ez Zor, Syria	Water pumping reduced by 90% due to damage
July 2014	Baghdad, Iraq	IS gained control on Samarra Barrage
June 2014	Aleppo, Syria	the explosion damaged water pipes, sewage pipes, electric cables for water station, 2 million affected
June 2014	Mosul, Iraq	IS captured and cut off water to Mosul city
July - June 2014	Gaza	Operation Protective Edge by Israel damaged water infrastructure
Mid 2014	Homs, Hama, Syria	Pipeline to Homs and Hama from Orontes attacked and damaged

May 2014	Aleppo, Syria	Water pumping station stopped working, 3 million people affected
May 2014	Rakka, Syria	Lake Assad dried up
April 2014	Tikrit, Iraq	Oil pipeline burst, oil ablaze on Tigris
April 2014	Al Anbar, Iraq	IS shut Fallujah gates
First half of 2014	Iraq	IS floods 22 villages
January 2014	Al Anbar, Iraq	IS gained control on Fallujah
2013	Syria	Water poisoning in Aleppo, Deir Ez Zor, Rakka, Idlib
February 2013	Rakka, Syria	IS captured Tabqa dam
November 2012	Syria	IS captured Tishrin Dam
November 2012	Gaza	Operation Pillar of Defense affected 1.5 million people due to damage to the main pipeline
2010-2012	Turkey	PKK carries out three attacks on Silvan Dam being built in eastern and southeastern Turkey
December 2008 - Jan 2009	Gaza	Operation Cast Lead by Israel damaged to a great extent the sewage plants and main water pipelines
	Lebanon	Jiyyeh power plant bombed by Israel
July 2006 July 2006	South Lebanon	Israeli bombing of roads, canals, water plants, power stations etc.
April 2003	Zarqa, Jordan	Iraqi agents caught scheming poisoning water of US army
2003	Baghdad, Iraq	40% of water network destroyed due to bombing, half city cut off from supply
Late 1990s	Iraq	The US imposed sanctions and withheld contracts for water network
1992	Istanbul, Turkey	PKK poisons water tank with potassium cyanide at Turkish air force base
1991	Kuwait	Iraq army burnt 730 oil wells, destroyed marine life and water

ISIS and Water Infrastructure

Name/Location	ISIS/or ISIS controlled	Currently Controlled by
Tishrin Dam (Euphrates, Syria)	November 2012 - December 2015	Kurds/Syrian opposition
Euphrates Dam/ Tabqa dam with Lake Assad (Euphrates, Syria)	February 2013	ISIS
Baath Dam (Euphrates, Syria)	February 2013	ISIS
Mosul Dam (Tigris, Iraq)	7-18 August 2014	Peshmerga
Haditha Dam (Euphrates, Iraq)	-	Iraqi troops
Ramadi barrage (Euphrates, Iraq)	March 2015 - January 2016	Iraqi troops
Falluja/Numaimiya dam (Euphrates, Iraq)	April 2014	ISIS
Samarra Barrage/ Tharthar dam (Tigris, Iraq)	April 2014 - October 2015	Iraqi troops

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About Strategic Foresight Group

Strategic Foresight Group (SFG) is a think - tank engaged in crafting new policy concepts that enable decision makers to prepare for a future in uncertain times. Founded in 2002 to create new forms of intellectual capital, our body of work today encompasses over 50 countries, across four continents. SFG has published over 30 indepth research reports in English with some translations in Arabic and Spanish. We currently work within three areas of focus: 1. Water Diplomacy 2. Peace, Conflict and Terrorism 3.Global Foresight.

SFG analysis and recommendations have been discussed in the United Nations, UK House of Lords, House of Commons, Indian Parliament, European Parliament, Alliance of Civilization, World Bank, World Economic Forum (Davos), and quoted in over 2000 newspapers and media sources. Several Heads of Government, Cabinet Ministers and Members of Parliament have participated in SFG activities.

SFG is known for pioneering the concept of Blue Peace to transform water from a source of crisis to an instrument of peace and cooperation. It has worked in the Middle East, Africa, Eastern and Western Himalayan rivers basins in Asia to craft the Blue Peace approach. These efforts have involved the participation of Cabinet Ministers, Members of Parliament, heads of water authorities and experts from the three continents and defined sustainable and collaborative solutions to the trans-boundary water issues. In its 2015 report, Water Cooperation Quotient, Strategic Foresight Group has proposed a unique formula to predict the probability of war on the basis of water and peace equation.

www.strategicforesight.com

During 2009-2010, the spirit of cooperation between Iraq, Jordan, Lebanon, Syria and Turkey, paved the ground for building what was described by some as “a step towards the Union of the Middle East, similar to the European Union.” However, during 2011-2016, cooperation gave way to conflict, a system of states to a system of non-state armed actors, and co-existence to migration.

The cost of non-cooperation has been immense. Almost 40 million people in 30 governorates of Iraq, Jordan, Lebanon, Syria and Turkey are hydro-insecure. More than five million people have become internally displaced or refugees. In parts of Jordan and Lebanon, refugees outnumber the local population. Syria, which was most obstinate in refusing cooperation in water and environment, has experienced the largest devastation and the collapse of its institutions. Out of 500 public and private hospitals in the country, almost 200 are either out of service, destroyed or inaccessible. The water availability has fallen from 75 litres per person per day in 2011 to 25 litres in 2016. Crop production has reduced by 60% from 2011 to 2016. Food inflation has been 400-700% depending on the specific commodity. Not only in Syria but also across the region, the share of agriculture in GDP has declined by 50%.

Iraq, Lebanon and Syria have experienced significant increase in water and food borne diseases since 2011. Iraq had cholera outbreak in 2015 and also the return of polio epidemic for the first time in the 21st century. And away from the front pages, people in Gaza continue to suffer.

This report provides the details of costs incurred by common people across the Middle East due to lack of cooperation in water, environment and other issues critical for human survival. We hope that it will encourage debate and make people see reason at the end of the tunnel.

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