

The Economic Cost of the Israeli Occupation of the occupied Palestinian Territories

2015

Prepared by:
The Applied Research Institute - Jerusalem (ARIJ)



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development
and Cooperation SDC

The economic cost of the Israeli occupation of the occupied Palestinian Territories
2015

Authors:

Jad Isaac

Manal Khalil

Khaldoun Rishmawi

Ahmad Dabouqi

Ludovico Marinelli

The Applied Research Institute – Jerusalem (ARIJ)



**This publication has been produced with the assistance of the Swiss Agency
for Development and Cooperation SDC.**

**The contents of the publication are the sole responsibility of the individual
organizations only, and can in no way be taken to reflect the views of the
Swiss Agency for Development and Cooperation SDC.**

Table of contents

Abstract.....	3
1. Introduction.....	4
2. Natural Resources	6
2.1 ACCESS TO WATER RESOURCES	6
2.2 GAS MARINE RESERVE	12
2.3 ACCESS TO FISHING ZONE.....	13
2.4 LAND CONFISCATION.....	14
3. Infrastructure	16
3.1 ISRAELI ASSAULT ON GAZA STRIP 2014 (<i>UNDP & ARIJ, PRELIMINARY ASSESSMENT: GAZA CRISIS – 2014, 2014</i>).....	16
3.2 HOUSE DEMOLITIONS.....	20
3.3 ELECTRICITY	21
3.4 RESTRICTIONS ON DOMESTIC MOVEMENT OF GOODS AND SERVICES	22
4. Industries and Services.....	27
4.1 MINING AND QUARRYING	27
DEAD SEA SALTS AND MINERALS.....	27
QUARRIES	29
4.2 BANKING	30
4.3 AGRICULTURE	31
4.4 TOURISM	33
4.5 TELECOMMUNICATIONS	34
4.6 EXPORT AND IMPORT RESTRICTIONS.....	35
5. Human Capital	42
5.1 PALESTINIAN PRISONERS IN ISRAEL	42
5.2 DEDUCTIONS FROM PALESTINIAN WORKERS IN ISRAEL.....	42
Further Repercussions	46
Conclusion.....	47
Appendix 1: Dual-use item list	48
References	52

Abstract

The Israeli occupation of Palestine imposes a huge price tag on the Palestinian economy. Israel restricts Palestinian access to their natural resources, controls Palestinian import and export processes due to its control over borders, hinders the development of many Palestinian industries, and continues to damage Palestinian infrastructure while restricting economic development, especially in Area C.

This report aims at analyzing Israeli restrictions imposed on the main economic sectors and resource development in Palestine. It calculates the direct costs of these restrictions and the forgone revenue due to lost development opportunities through the use of economic models. More specifically, the report measures the direct and forgone revenue losses from: (1) the gas marine reserve and fish industry due to restricted control over territorial water near the Gaza Strip; (2) the cost of confiscated land in the West Bank; (3) the forgone revenue from irrigated agriculture due to access restrictions to Palestinian water resources; (4) the cost of Israeli assault on Palestinian infrastructure, including the implications of the Israeli assault on Gaza Strip in 2014 and house demolitions in the West Bank; (5) cost of electricity purchased from Israel; and (6) the cost of restrictions on movement of goods and people within the West Bank.

The report further extends the analysis to include the impacts on Palestinian industries of mining and quarrying, tourism, banking, telecommunications, as well as the costs of fiscal revenue leakage from the Palestinian authority to Israel due to trade agreements and the current clearance system.

We found that the total economic cost of the Israeli occupation in Palestine to be around 9.46 billion US dollars, representing almost 74.27% of Palestinian nominal GDP¹ of 2014.

¹ Throughout the report, GDP refers to Palestinian GDP (current US\$) for 2014, reported by World Bank as \$12,737,613,125.

1. Introduction

The Israeli occupation imposes a myriad of restrictions on the Palestinian economy that are impeding any prospects of sustainable economic growth in the occupied Palestinian territory (World Bank 2011 and 2014, UNCTAD 2011, and IMF 2011). The Israeli occupation prevents Palestinians from accessing much of their land and from exploiting their natural resources. It further isolates the Palestinians from global markets, and fragments their territory into small and disconnected “cantons”.

Many of these restrictions have been in place since the start of the occupation in 1967, reflecting an unchanged colonial attitude of Israel, which aims at exploiting the Palestinian natural resources including land, water and mining resources for its own economic benefits. This policy has been coupled by the desire of Israel to prevent any Palestinian competition with Israeli economic interests. This has been summed up by Yitzhak Rabin, while holding the post of Israel’s defense minister in 1986 when he stated that “there will be no development initiated by the Israeli Government, and no permits will be given for expanding agriculture or industry, which may compete with the State of Israel” (UNCTAD, 1986). This has been (and still is) reflected in a series of Israeli obstacles related to customs, transportation and infrastructure which have prevented the development of a competitive Palestinian tradable sector and especially Palestinian trade with non-Israeli partners.

In 2011, the Applied Research Institute-Jerusalem (ARIJ) in collaboration with the Palestinian Ministry of National Economy systematically quantified the costs of the Israeli occupation on the Palestinian economy (MoNE & ARIJ 2011). This report is a second of the series that aims at monitoring and quantifying the changes in the costs of the Israeli occupation on the Palestinian economy. It further refines the analysis methods and expands the scope of the report as follows:

- **New** sectors and subsectors were introduced
- **New methods** and **economic assumptions** were introduced
- **Data** were updated to reflect more recent developments

The report measures the direct and indirect costs where possible. Direct costs are those directly borne by the Palestinian economy due to Israeli restrictions; these include higher costs of electricity, water, and the movement of goods and people. The indirect costs are the foregone revenues from production that were not realized due to the restrictions imposed by the occupation. These revenues would probably have been materialized had Palestine been a free and sovereign state.

This quantification is likely to be an under-estimation of the true costs of the occupation, as we have made the choice to quantify only those costs for which reliable and relatively precise estimations could be provided. This report details the various costs of occupation, the methods used in the analysis, and the data sources.

2. Natural Resources

Israel imposes restrictions on Palestinian access to their natural resources, while it continues to exploit these resources for its own benefit. The majority of these restrictions are imposed on Area C, of which “only a small part is accessible to Palestinian economic agents, and is fully subject to Israeli military control.” (World Bank, 2013). The impact of these restrictions is not limited to the direct cost paid by Palestinian – as that of purchasing water from Israel for example, but exceeds that to include indirect costs resulting from loss of potential development of vital industries that mainly depend on such access.

For the purpose of calculating the economic cost of access restrictions to Palestinian natural resources, four main categories have been considered. These include direct and indirect losses resulting from restricted access to water resources, restricted access to the gas marine reserves, and restricted access to allocated fishing ranges in the Gaza Strip, and land confiscation in the West Bank. Economic implications of restricted access to natural resources are not limited to those discussed within this section, and are further discussed within the Industries Sector.

The economic cost of the Israeli occupation resulting from restricted access to natural resources discussed within the scope of this report has been estimated at \$2,485.96 million.²

2.1 Access to water resources

Palestinians have had very limited access to the water resources within their post-1967 border territories. Israel assumed control of most of the water resources including waters from the Jordan River and from the groundwater aquifers.³ For example, Palestinians only have access to about 15% of the annual recharge capacity of the West Bank’s water system (Haddad, 2009) which is in direct violation of both the International Humanitarian Law and International Human Rights Law. These laws restrict the exploitation of natural resources present within occupied territories by the occupying power (Tignino, 2009).

There are three groundwater aquifer systems (basins) underlying the Palestinian territory. These are the Eastern aquifer, the Western Aquifer, and the North-western aquifer. The safe yield of these aquifers was estimated at 679 million cubic meter (MCM)/year (Table 1). Article 40 in the

² Note: Average exchange rate for 2015 has been used throughout the report, where \$1 = 3.85 NIS

³ In fact one of the first military orders issued by the Israeli civil administration prohibited Palestinians from using the water sources without permission (Order Regarding Powers Involving Water Laws (No. 92), 5727 – 1967, issued on 15 August 1967).

Oslo Agreement allocated Palestinians 138.5 MCM, about one fifth of the estimated potential while Israel was allocated around 80% (World Bank, 2009). This was supposed to be a temporary allocation to be revised within five years and then settled along with other issues during successive negotiations.

Based on the location of the water basins and their recharge areas and rates, we estimated that the water accruing to the Palestinians from these aquifers should be around 469 MCM/year. The eastern aquifer lies entirely within the West Bank territory; so it should be exclusively used by Palestinians. The North-eastern aquifer is 80% within the Palestinian territory, and the remainder is shared with Israel. The western aquifer has 80% of its recharge area within the West Bank while 80% of its storage area is located within Israeli territory. Accordingly, this aquifer should normally be equally shared (50%) between the Palestinians and the Israelis.

Aquifer	Potential (MCM/year)	Palestinian allocation* (MCM)	Proposed Palestinian allocation*** (MCM)	Palestinian Abstraction2012 (MCM) (PCBS 2012)
Eastern	172	74.5**	172 (100% of 172)	53
Northeastern	145	42	116 (80% of 145)	23
Western	362	22	181 (50% of 362)	28
Total/ year	679	138.5	469	104

Table 1. Safe yields of the ground water aquifers in the West Bank, water allocation to Palestinians according to the Oslo II agreement and actual Palestinian abstraction from the three aquifers.

* According to Article 40 (Oslo II Agreement, September 18, 1995).

** Including extra 20.5 MCM of "immediate needs" to be developed for Palestinian use from Eastern Aquifer.

***The proposed allocation was considered according to the aquifer location and recharge area.

However, the current water allocation is not equitable. Israel has almost complete control of the aquifers in the West Bank from which it abstracts a large share of its water consumption (World Bank, 2009). In fact Israel has been consistently over-extracting even vis-à-vis its generous allocation of water according to Article 40. World Bank (2009) estimates that Israel over-extracts about 389 MCM per year relative to its Article 40 allocation (a total abstraction of 871 MCM per year), thus causing the depletion of the aquifers' reserves. This comes at the expense of the Palestinians, who have been able to extract only 104 MCM from aquifers in 2012 (PCBS, 2012). The Israel Water Authority has used its role as a regulator to prevent Palestinian drilling in the Western Aquifer, despite growing demand from Palestinian towns. Israel offers to "sell back" the water that it has tapped from the aquifers to the Palestinians. Since the beginning of the occupation, Israel has developed wells in the West Bank (largely in the Jordan Valley) and a network serving settlements that is linked to the Israeli national water network. The settlements

are consuming about 44 MCM of water extracted from wells within the West Bank (World Bank, 2009).

Half of Palestinian wells have dried up over the last twenty years and effects are particularly severe for the generally more vulnerable population groups living in Area C. PCBS (2009a) reported that in 2008, 325 Palestinian wells were operational in the West Bank, compared to 774 wells in 1967. Area C of the West Bank is where most Palestinians water resources exist. However any Palestinian attempt to access new water sources or connect new areas is inevitably curbed by the restrictions imposed by Israel in the area. Current project approval rules requires the approval of the Joint Water Commission and that of the Israeli Civil Administration. The latter approval is required where projects are connected to Area C, which is the case for almost all wells, water conveyance and wastewater treatment and reuse infrastructure (World Bank, 2009). A number of projects have been approved by the Joint Water Committee, for which the Israeli Civil Administration has not granted a detailed planning permission. As a consequence of these policies, Palestinians are suffering from real water crises. Average water consumption by Palestinians was estimated at 73 l/c/d (liter per capita per day) and in some areas water use, which is limited by supply, may not exceed 20 l/c/d. These quantities are 51% and 80% lower than the minimum clean water requirements set forth by the World Health Organization; respectively. This is in stark contrast to average water consumption in Israel which was estimated at about 544 lpcd (World Bank, 2009).

The Jordan River is an example of an even more inequitable allocation of water resources. Israel uses approximately 58.7% of the water of the Jordan River; Jordan uses 23.4%; Syria 11% and Lebanon 0.3% (McHugh, 2009). Palestinians, in contrast, are not allocated any of the Jordan's River water resources. Absence occupation, Palestine would have riparian rights to Jordan River water. As argued by Glover and Hunter (2010), the most equitable means of reallocating Jordan water would be on a per capita basis, so that each riparian would receive a share of water proportionate to its population size. This view is also supported by Phillips et al. (2005), whose work argues that there is a legal precedent for this option. According to the current estimated allocation, Israel is using approximately 769.56 MCM of Jordan water annually. Based on the 2008 population statistics for Israel, the West Bank and Gaza, Glover and Hunter (2010) estimate that an equitable per capita distribution of Israel's current allocation of Jordan River water would be 268 MCM for the Palestinians, and 501 MCM for Israelis. The 268 MCM figure for Palestinians is also very close to the allocation of the Johnston plan, which the literature estimates to be around 257 MCM/year (Abu Ju'ub, 2003).

Israeli restrictions on access to water limit the amount of water that Palestinians can use; especially in the West Bank (tables 2 and 3). Aside from the 104 MCM abstracted from the Aquifers, Palestinians in West Bank areas were forced to buy around 63.3MCM from the Israeli Water Company (Mekorot) in 2013 (table 2) for domestic consumption (PCBS, 2013).

Water supply for domestic use (MCM)	Wells	Springs	Mekorot	Total
WB	35.8	19.75	59.3	114.85
Gaza	103.3		4	107.3
Total	139.1	19.75	63.3	202.4

Table 2. Sources of water supply for domestic uses in Palestine (Source: PCBS, 2013).

Water supply for agriculture (MCM)	Wells	Springs	Total
WB	28.5	19.75	
Gaza	95.3		
Total	123.8	19.75	143.55

Table 3. Sources of water supply for agricultural uses in Palestine (Source: PCBS, 2013).

Considering that in Gaza the renewable safe yield of the Aquifer has been estimated to be 55-60 MCM/yr (Vengosh et al., 2004)⁴, the total allocation of water to Palestinians in a situation without occupation should be around 797 MCM. Haddad (2009), on the other hand, argues that Palestinian water allocation should range between (1,000 – 1,100 MCM). Nonetheless, both our and Haddad (2009) estimations of Palestinian water rights from conventional water resources far exceed the water volume Israel allows the Palestinians to abstract.

Restricted access to water resources generates 3 main costs to the Palestinian economy: (1) cost of water paid to the Israeli water company – Mekorot, (2) foregone production value from irrigated agriculture, and (3) health cost due to poor water quantity and quality.

Cost of Water purchased from Israel

The direct costs of water access restrictions are measured by the cost of water purchased by Palestinians from Israel. In 2013, Palestinians in the West Bank and Gaza have purchased 59.3 MCM and 4.0 MCM of water; respectively. Given that water prices in the West Bank and Gaza are 2.7 NIS and 2.4 NIS⁵ (PCBS, 2011), Palestinians have paid a direct cost of **\$44.08 million** to Mekorot.

The cost difference between water purchased from Israel, and the cost of abstraction by Palestinians cannot be currently calculated since abstraction costs vary depending on water

⁴ However note that Gaza over-extracts from the Aquifer with a total extraction of around 160 MCM per year (PCBS, 2009b).

⁵ \$0.70 and \$0.62

depth. In areas like Tulkarem - where wells are only 60-70 meters deep - abstraction costs average NIS 0.5 (USD 0.15) per m³.⁶ In central West Bank - where wells are much deeper - the cost could reach up to NIS 2 (USD 0.60) per m³.⁷

Foregone production value from irrigated agriculture

The highest costs from water restrictions in Palestine are due to the foregone production value from irrigated agriculture. The restrictions to water (also land) access have constrained the development of irrigated agriculture in Palestine. Only 21.3% of the cultivated land is irrigated in Palestine (Calculated from PCBS 2013). Quoting data from OCHA oPt (2010), the World Bank notes that while in 2010 “the Israeli military removed some 80 roadblocks that impeded vehicular access for limited numbers of farmers to agricultural land in Area C, no improvement was observed regarding access to much larger agricultural areas” (World Bank, 2010, p. 14). This problem is compounded by the restrictions imposed on the development of mechanised irrigation systems or greenhouses for Palestinians in area C.

The small share of irrigated agriculture and restrictions on land access constrain the agricultural sector and impact its development. According to land surveys and data from the Ministry of Agriculture in 2007, if sufficient water was available, the total potentially irrigable area in the Palestinian territories would be 745,000.0 dunum (Glover and Hunter, 2010), compared to 296,776.0 dunum of irrigated land in 2013. This is an additional 448,224.0 dunum of irrigated land that would become available to Palestinians if restriction on water and land uses were lifted.

Glover and Hunter (2010) computed the weighted average water requirement for an irrigated dunum of land on the basis of the current cropping pattern in Palestine.⁸ These calculations show that the average irrigated water requirement per dunum, per year, is 579 CM. As Glover and Hunter (2010) note, this figure should be viewed as an upper limit of the water that could be needed. Based on this estimate, 259.57 MCM/year is needed to irrigate the additional 448,224.0 dunum of arable land. Furthermore, Glover and Hunter (2010) estimated that domestic and industrial water demand projections for Palestinians is 260 MCM for 2015. Securing domestic and industrial water demand will therefore leave 209 MCM of water for irrigated agriculture,

⁶ Based on personal communications with the Palestinian Water Authority.

⁷ Based on personal communications with the Palestinian Water Authority.

⁸ This approach is similar to that used in Jayyousi and Srouji (2009), but provides a more accurate assessment of the average water requirement for irrigated land in Palestine. Rather than averaging the water need for all irrigated crops farmed in Palestine, this study weights their contribution to overall agricultural production – therefore providing a fair reflection of water use under current cropping patterns.

capable of irrigating 360,898.62 dunum of potential agricultural land, of which 50,000.0 dunum are specifically located in the Jordan Valley, while 310,898.62 dunum are in the rest of Palestine. Based on data on value of production from PCBS in 2009, potential irrigated land (310,898.62 dunum) is expected to yield \$494.50 million, in addition to 20% of foregone production from the use of “correct” fertilizers (discussed in subsection 4.6) estimated at \$98.9 million.

Gal et al. (2010) suggest that if 50,000 dunums of arable land is irrigated in the Jordan Valley, this would yield a \$1 billion from the agro-industry. Accordingly, value added from additional irrigated agriculture in Palestine is estimated at **\$1,243.63 million**, accounting for **9.8% of GDP**.

Box 1: A USD 1 billion agro-industry on 50,000 dunums in the Jordan Valley

Gal et al. (2010) estimate a potential USD 1 billion-worth agricultural production in the Jordan Valley through an examination of a series of evidence. Firstly, they noted that the cumulative plant exports of Israeli Gaza-Strip settlements alone, prior to the 2005 disengagement, was estimated at around USD 100 million (produced on around 10,000 dunum of greenhouses), and the export revenue of Gaza flower growers, produced on around 1,000 dunum, was around USD 10 million.

Secondly, they estimate that the huge demand for quality vegetables and flowers in the Gulf Cooperation Council (GCC) markets, and in East and West European markets, “could easily absorb Palestinian high-value vegetable and flower exports at least ten-times higher than was produced in pre 2005 Gaza, i.e. some USD one-billion industry”. In particular, they argue, the GCC countries are key markets in this respect given the free access of Palestine (as a member to GAFTA) to them, and their huge size boosted by their role as international marketplace for flowers and other agricultural products as well. In addition the quality-edge gained by the close access to Israeli growing technologies, would endow Palestinian growers important comparative advantage in these markets.

Third, based on growing technologies that were used in Gaza, this supply of high value added agricultural products would require a total growing area of around 100,000 dunums, most of it in the Jordan valley.⁹ However, new highly-intensive soil-less growing technologies, which have been developed in Israel (and in some other places) in recent years, enable growers to enhance productivity up to five to ten times (per dunum of greenhouses), compared to the productivity of pre-2005 Gaza. Therefore an appropriate mix of such new technologies, with "old" greenhouse growing technologies and some open-field crops, would enable to develop a USD one-billion per year export-oriented high-value vegetable, flower, and herb industry, on around 50,000 dunum in the Jordan Valley.

Source: Gal et al. (2010)

⁹ The Jordan Valley has a similar potential inherent agricultural productivity as the Gaza area.

Although these numbers are important relative to the size of the Palestinian economy, they appear to be conservative estimates vis-à-vis what other authors have suggested (Glover & Hunter, 2010). It has been estimated that the economic potential of the sector could reach USD 4.59 billion; and projections suggest that if export demand was unlimited and no restrictions or tariffs were placed upon export volumes, net profits could rise as high as USD 5.93 billion (Nasser, 2003).

Health costs

The quality of the water is poor in various parts of Palestine, especially in smaller communities that are not connected to the water network and especially for people living in Area C. In these areas, the health impacts of poor water quality are apparent with a high incidence of water-borne diseases (World Bank, 2009).

As reported by WaSH (2004) in November 2002, the community of Jurish in Nablus district were using about 30 lpcd of poor quality tanker water. The cost was high at 15 NIS/m³, a cost driven up by the impact of checkpoints during the trip of about 3km from the well. In the community of 1,500, there were 300 cases of amoeba infection at the time, due to poor water quality affected by sewage water near their cisterns.

As noted by the World Bank (2009) the health impacts can be gauged by the high incidence of diarrhea amongst infants. The 2006 PAPFAM survey found that 12% of children under 5 had suffered from diarrhea in the two weeks preceding the survey. Diarrheal conditions are strongly associated with water quality, hygiene and sanitation. Some 54% of these cases had necessitated a medical consultation. Extrapolating from the nature and cost of the medical treatments involved and without accounting for the losses of adult productivity, it has been estimated that the annual cost of the health impacts of poor water and sanitation on children 5-year old or less, is **USD 20 million** (World Bank, 2009 on the basis of Glover and Hunter, 2010).

Accordingly, restricted access to water resources has a total cost of **\$1,307.71 million**, or 10.3% of GDP.

2.2 Gas marine reserve

The development of natural resources in Gaza is constrained by Israel. In 1999, a consortium comprising British Gas Group, the Consolidated Contractors Company (CCC), and the Palestine Investment Fund (PIF) was granted exclusive oil and gas exploration rights off the Gaza coast in

an agreement signed with the PA (PIF, 2011). In 2000, the consortium discovered over 30 billion cubic meters of natural gas in two Palestinian offshore gas fields: the Gaza Marine - located entirely in Palestinian territorial waters, containing an estimated 28 billion cubic meters of gas - and the Border Field - which is an extension of the Israeli Noa Field, partially located in Israeli territorial waters. The volume of gas in the Border Field is estimated at around 3.5 billion cubic meters (PIF, 2011).

At 2010 prices, the value of the natural gas discovered in both fields is estimated at over \$6.5 billion (PIF, 2011). The consortium has invested around \$100 million in the venture but the total volume of investment in the project is expected to reach \$800 million (PIF, 2011). However, Israeli restrictions have so far impeded the development of the project including the extraction, sale and use of the gas. Israel's de facto control of Gaza's territorial waters has held back attempts to export Palestinian natural gas to international markets. Israel has refused to implement measures required to extend a pipeline to Al-Areesh in Egypt (PIF, 2011); a prerequisite to liquefying the gas and exporting it to international markets. Israel has also refused to provide the necessary clearances required by developers (PIF, 2011). In addition, negotiations to export gas to Israel have been unsuccessful to date, as the PA and developers are not willing to sell gas at lower than fair market prices. The Palestinian Authority and developers continue to demand clear guarantees (so far unsuccessfully), backed by commercial contracts, that the Gaza power station will be supplied with natural gas on an uninterrupted basis in the event that Palestinian natural gas is exported to Israel. Guarantees are also being sought that gas revenues be transferred to the PA without hindrance.

All these obstacles have prevented the Palestinian economy from realizing the potential benefits of a project that could provide significant revenues to the PA and at the same time could help make Palestine self-sufficient in energy terms. Palestinian proceeds from the natural gas project will amount to 50% of the venture's net profits. The PA will receive royalties, tax revenues and PIF profit, which the consortium estimates to be around \$2.4 billion throughout the 15-year lifespan of the project. This means an annual income of **\$160 million** for the PA, or **1.3% of GDP** which is currently foregone due to Israeli restrictions.

2.3 Access to Fishing Zone

The fishing industry – mainly based in the Gaza Strip – has been under siege since 2006. According to the Oslo Accords, the fishing range in the Gaza Strip was 20 nautical miles. But,

the Israeli military has reduced this range to 3 nautical miles, before expanding it to 6 nautical miles after the war on Gaza Strip in 2014.

Today, Palestinians in Gaza are only allowed access to 30% of their fishing range. According to OCHA and WFP (2010), “access restrictions are primarily enforced by opening fire no people entering the restricted areas”, while “an estimated 178,000 people - 12 percent of the population of the Gaza Strip are directly affected by these access restrictions” (OCHA & WFP, 2010).

Due to these access restrictions, the fishing industry suffers from the direct loss of forgone fish production of a wider variety of fish within 14 nautical miles. In addition, this lower supply of fish is leading to higher prices of fish in the Palestinian market, making it less accessible for households.

According to PCBS, the average annual amount of the Palestinian production of fish within the 6 nautical miles is 1,699 tons. At the 20 nautical miles, production is expected to reach 5,665 tons – more than 3 times the current production (table 4).

Accordingly, the Palestinian fish industry is incurring an annual loss of **\$18.36** due to access restrictions, accounting for **0.1% of GDP**.

The average annual amount of the Palestinian production of fish (6 miles) (Ton)	1,699
Palestinian production is expected within 20 miles per (Ton)	5,665
Value of annual fish production in Palestine on the 6 mile (\$)	7,868,366
Value of annual fish production in Palestine on the 20 mile (\$)	26,227,885
Fish industry losses due to access restrictions	18,359,520

Table 4. Fishing industry opportunity costs from lack of access to territorial waters (Author’s elaboration based on data from PCBS (2011))

2.4 Land confiscation

Israeli policy of Palestinian land confiscation and expropriation continues since its occupation of the West Bank, East Jerusalem and Gaza Strip in 1967. Reasons behind confiscation have included the building of Israeli settlements, bypass roads, and the construction of the Segregation Wall.

ARIJ database on land confiscation indicated that 714,633 dunums of land have been confiscated in the different governorates of the West Bank, of which 239,011.7 are in East Jerusalem.

The impact of land confiscation on the Palestinian economy includes the direct loss of the value of the land, in addition to the loss of potential agricultural production if confiscated land is arable. It also includes the indirect costs of artificial inflation in land values in areas where Palestinians have administrative control and can issue building permits.

In order to measure the cost of confiscated land in the West Bank, and its economic impact, this study used the number of dunums confiscated in each governorate of the West Bank since 1994. Average price of land in each governorate have been estimated based on surveys and interviews with land valuation experts within each governorate (table 5).

Accordingly, the Palestinian economy loses an average of **\$999.89 million** due to direct costs of land confiscation, accounting for **7.8% of GDP**. This figure does not include the forgone revenue from agriculture in these confiscated areas as well as the indirect impacts of artificial inflation of land prices on the Palestinian economy.

	Jenin	Tubas	Tulkarm	Nablus	Qalqilya	Salfit	Ramallah	Jericho	Jerusalem	Bethlehem	Hebron
Average area of confiscated land (dunum)	1,440.2	459.7	1,203.1	3,624.3	2,075.2	473.1	3,608.5	1,602.9	10,510.8	4,077.8	3,683.1
Average price (\$/dunum)	12,600.0	2,100.0	8,400.0	14,000.0	21,000.0	4,550.0	54,516.0	3,920.0	49,000.0	16,800.0	23,800.0
Total cost of confiscated land (\$ million)	18.146	0.965	10.106	50.740	43.578	2.152	196.722	6.283	515.027	68.507	87.658

Table 5. Cost of annual land confiscation in the West Bank (Author's elaborations based on data from ARIJ Settlement Monitoring Department (2015))

3. Infrastructure

Developed infrastructure is an essential basis for economic development. Infrastructure creates an enabling environment for growth, and increases the efficiency of development and industrial projects. “Not only does infrastructure in itself enhance the efficiency of production, transportation, and communication, but it also helps provide economic incentives to public and private sector participants” (Graefe and Alexeenko, 2008). Israel has targeted basic Palestinian infrastructure in the West Bank and Gaza Strip since the beginning of its occupation. House demolitions in the West Bank – especially in East Jerusalem – have expanded for building the separation wall, while Gaza Strip has incurred severe infrastructural damages in all sectors through Israel’s three major assaults on the strip since 2008. The repercussions of these damages have been reflected in annual Palestinian economic indicators, and will continue to affect the Palestinian economy for years, especially that reconstruction attempts are facing Israeli restrictions.

For the purpose of measuring the economic impact on Palestinian infrastructure, this section constitutes economic losses due to the Israeli assault on Gaza Strip in 2014, cost of electricity, house demolitions, and restrictions on domestic movement of goods and services. The cost of these assaults is estimated at \$3,343.2 million.

3.1 Israeli Assault on Gaza Strip 2014 (*UNDP & ARIJ, Preliminary Assessment: Gaza Crisis – 2014, 2014*)

Agriculture

One of the sectors most extensively affected is the agricultural sector which was directly targeted by the Israeli army. Hundreds of sheep and cow heads have died as a result of direct assaults and from lack of feed and water; as the owners were unable to access their farms. Furthermore, a large number of irrigation wells, irrigation systems, greenhouses, productive trees, post-harvest facilities and agricultural equipment were targeted and destroyed. The preliminary assessment of the assault on Gaza Strip 2014 (ARIJ, UNDP/PAPP) estimates that the value of damage in the agricultural sector of the Gaza Strip were **\$449.15 million**. These included both direct and indirect losses.

Health

The surveyed damages and assessed urgent needs of the hospitals and medical centers by the Ministry of Health (MoH) showed that the main hospitals were all affected by the

Israeli bombardment: (1) They were not functioning within their normal capacities; and (2) they could not meet the medical needs of the population. Since the onset of the assault, 5 primary health clinics (PHCs) and 8 governmental hospitals were totally destroyed, 24 PHCs were partially destroyed, 10 ambulances were damaged, and 15 ambulances were partially damaged¹⁰. In addition, the assault resulted in a huge number of patients with physical disabilities and psychological traumas that required treatment. Accordingly, the value of damages in the health sector were estimated at **\$47.39 million**. The indirect costs of long term disabilities, psychological trauma, and the invaluable loss of human life were incalculable.

Education

The value of the damage of school buildings and infrastructure reached approximately \$22,119,000.¹¹ It is estimated that the reconstruction and rehabilitation of affected schools could take 3-10 months. And while schools that have been used as shelter will need to be restored to their pre-crisis state, the reconstruction of new schools to replace those that have been completely damaged is also needed. Damages incurred by schools were not limited to buildings and infrastructure, but also included the destruction of supplies. Resources such as furniture, computers, technology tools, libraries, stationary and science laboratory equipment were destroyed or damaged. The value of these damaged supplies reached approximately \$11,025,000.¹² Furthermore, 5 buildings of higher education institutes had incurred major damages. These included the Islamic University, Al Aqsa University, Palestine Technical College, and the University College of Applied Sciences. The value of damages incurred by these institutes was estimated at \$16,000,000.¹³ This brings the total damages in the education sector to **\$49.14 million**.

Housing

Still recovering from the 2008-09 and the 2012 wars, the 1.8 million Palestinians of the Gaza Strip have yet to deal with the inflicted damages to Gaza's housing and shelter infrastructure, further devastated by the recent 2014 assault. The assault that took the lives of nearly 2,000 Palestinians and injured more than 10,000 has also hit Gaza's housing sector severely. As a direct result of the Israeli assault; more than one-fourth of

¹⁰ Palestinian Ministry of Health – Gaza Strip, August 2014.

¹¹ Ibid.

¹² Palestinian Ministry of Education & Higher Education – Gaza Strip, August 2014.

¹³ Ibid.

Gaza's population has been categorized as Internally Displaced Persons (IDPs) (and the number is anticipated to increase). According to reports from the field; 68.4% (335,100 individual) of those displaced have become so due to the extensive damages to their houses. The value of the damages incurred by the housing sector were estimated at **\$970.00 million**.¹⁴

Water, Sanitation, and Hygiene

The attacks on Gaza severely crippled the water, sanitation and hygiene sectors. Primary water pipelines, water reservoirs, house connections, sewage pipelines, wastewater treatment plants and sewage pumping stations were damaged and have been directly targeted during the attacks. The damages to the water infrastructure have resulted in cuts or severely restricted water supply to Gaza's citizens, where the damages to the wastewater treatment plants and the sewage network has caused sewage flooding in the residential areas and the mixing of sewage with water, posing a severe environmental threat and risk of water-borne diseases.

The value of damages to the water and sanitation infrastructure is estimated at \$15,739,000 and \$7,590,100, respectively.¹⁵ This is in addition to another \$11,105,000 for the total damages that have been incurred by water and sanitation vehicles, equipment & IT, stationary and other unforeseen damages. This brings the total value of damages incurred by the sector to **\$34.43 million**. The impacts on the health, especially of children less than 5 years old who are especially susceptible to the debilitating effects of water-borne diseases, are still unfolding.

Road Infrastructure and Transportation

Damages to the road infrastructure included the destruction of primary, secondary and side roads. As a result, and in order to facilitate emergency relief missions, many municipalities had to act in order to open blocked streets – especially primary ones – through the rental of tractors to remove the rubble and facilitate the movement of people evacuating areas under attack. It is worth mentioning that almost 249 public vehicles were also destroyed in this attack. Those are vehicles owned by the civil defense, Ministry of Health (MoH), Palestinian Red Crescent Society (PRCS), municipalities and

¹⁴ Palestinian Ministry of Public Works & Housing – Gaza Strip, August 2014.

¹⁵ Palestinian Water Authority/Water sector - Gaza Strip. 2014.

other government agencies. The value of damages in road infrastructure and vehicles is estimated at **\$77.76 million**.

Electricity

The Israeli assault on the Gaza Strip caused infrastructural losses in the Electricity Sector estimated at some **\$55.84 million**. This included damages to the Gaza Electricity Distribution Corporation's (GDECO) main storage warehouse, damage to the electrical and steel structures of the electricity networks in the Gaza Strip, the destruction of the only local power plant supplying electricity to the Gaza Strip (located in Nuseirat) - which was attacked by Israel on July 29, and the destruction of Gaza North substation.

Palestinian Monetary Authority (PMA) & Banking

Banks within Gaza Strip have also incurred damages due to the Israeli attacks. Many of Gaza Strip's banks along with facilities belonging to the Palestinian Monetary Authority (PMA) have incurred some degree of damage, ranging from minor to major destruction of buildings, while others – like the Nuseirat Branch of the Arab Islamic Bank – have been completely destroyed. The continuous attacks on Gaza Strip have paralyzed the banking sector, during which no banks were able to open doors to people in order to withdraw cash needed for daily urgent needs, while many ATM machines were destroyed, or inaccessible due to the unsafe situation. The sector has incurred damages of **\$0.46 million**.

Industry, Manufacturing, Trade and Services

The economic losses that Gaza Strip has incurred due to the Israeli assault are huge. Some of these losses can be considered direct damages, such as the partial and total destruction of industrial facilities and commercial establishments – where the number of those affected is approximately 6,116, and the damage to Gaza Industrial Estate (GIE). In addition, it includes the production losses incurred during the assaults period. On the other hand, indirect damages include opportunity losses incurred by the private sector and loss of jobs, whose impact extends to affect the livelihood of targeted employees and their families. The losses of this sector are estimated at **\$1,041.25 million**.

Telecommunications & Information Technology

The Israeli assault on the Gaza Strip has affected the telecommunications and information technology sector. During the attacks, the network and connections of the only fixed telecommunications company in Gaza Strip – Paltel – has been severely damaged. Furthermore, cellular telecommunication companies such as Jawwal have incurred major damages. Major Internet Service Providers (ISPs) have also been targeted, either directly or through the destruction of their equipment, facilities, or connections. The total value of damages in this sector is estimated at **\$33.57 million**.

The overall loss incurred due to the assault on Gaza Strip is \$2,759.00 million, which account for 21.7% of GDP.

3.2 House Demolitions

House demolitions have become a common practice by the Israeli occupation forces in the West Bank since 1967. According to ICAHD, “the motivation for demolishing these homes is purely political, and racially informed: to either drive the Palestinians out of the country altogether (the “quiet transfer”) or to confine the four million residents of the West Bank, East Jerusalem and Gaza to a small, crowded, impoverished and disconnected enclaves.”

ARIJ database on house demolitions indicates that 3,947 houses have been demolished throughout the West Bank governorates since 1994 till mid-2015. Jerusalem has been the governorate most affected by house demolition with 1,330 houses demolished in the same period. House demolitions are mostly carried under the pretext of “building without a proper permit”. It should be noted though that building permits are rarely granted by the Israeli authorities within Jerusalem and within Area C. In addition, data show that the Jordan Valley area has become the new target of house demolitions with 139 houses demolished since 2010.

The impacts of house demolitions on Palestinian are widespread. The impacts include the direct cost of the structure, relocation costs, in addition to other social and psychological implications.

In order to measure the cost of house demolitions in the West Bank and its economic impact, this study used the average number of house demolitions in each governorate of the West Bank since 1993. Average cost of housing units in each governorate have been estimated based on surveys and interviews with land and housing valuation experts within each governorate. We

also used the assumption that the average area of housing units is 150 m². Based on these assumptions (table 6), the Palestinian economy is incurring an average annual cost of **\$10.27 million** due to the direct costs of house demolitions, which accounts to **0.1% of GDP**. It should be noted that the \$10.27 million figure does not include relocation costs and the other social and psychological implications of house demolition and family relocations that are difficult to measure.

Index/Governorate	Jenin	Tubas	Tulkarem	Nablus	Qalqilya	Salfit	Ramallah	Jericho	Jerusalem	Bethlehem	Hebron
Average number of demolished housing units	13.9	33.9	6.5	15.7	3.0	3.0	7.5	9.1	57.9	9.6	30.9
Average cost (\$/m ²)	323.1	280.0	354.7	420.0	400.0	264.3	475.8	266.0	415.3	346.9	330.9
Total cost (\$/housing unit)	48,461.5	42,000.0	53,200.0	63,000.0	60,000.0	39,648.0	71,366.4	39,900.0	62,300.0	52,038.0	49,636.4
Total cost of demolished housing units (\$)	674,056	1,422,400	348,218	987,955	177,273	118,944	538,492	362,727	3,604,905	501,457	1,534,215

Table 6. Direct cost of house demolition in the West Bank (Author's elaboration based on data from ARIJ settlement monitoring department (2015))

3.3 Electricity

The main constraints facing the development of the Palestinian energy sector are restrictions imposed by Israeli policies and actions. These constraints arise from: (i) Israeli control over parts of the West Bank (Area C) which can impose a serious challenge to constructing the power network in these areas in the event that Israeli cooperation and coordination is not forthcoming; (ii) Israeli control of Palestinian territorial borders, particularly in the West Bank, which can effectively deny or limit trade across international borders, including importation of electricity and petroleum products through physical interconnections; (iii) Israeli destruction of Palestinian power plant on 29 July, 2014 during the Israeli assault on Gaza Strip; and (iv) Israeli related impediments to the Gaza marine gas field exploitation.

As argued above, a situation free of Israeli restrictions would allow the West Bank and Gaza to produce all electricity needed by developing gas-fed power plants. The occupation has restricted the potential for electric generation due to restrictions on the importation of spare parts as well as not guaranteeing the import of gas needed to run the power plant. That is why, if Palestine had been a sovereign country, we assume that it would have been able to develop a gas-fed plant

to generate the needed electricity. In addition, Palestinian power plants in both the West Bank and Gaza Strip could run with the natural gas from the Marine offshore in Gaza, which at present has not been developed as a result of Israeli restrictions. Generating electricity in Palestinian power plants with Palestinian natural Gas would be less costly than importing diesel from Israel. PIF and a number of Palestinian investors recently announced plans to establish a new power plant in the West Bank. A third power plant is also being considered in order to bring the total local electrical generation capacity to 1250 MW. This is expected to make Palestinian energy self-sufficient, thus saving the treasury hundreds of millions of dollars annually by eliminating the need to import electricity from Israel (PIF, 2011).

We estimate below the direct costs of electricity that the Palestinian economy has to face due to Israeli occupation vis-à-vis the cost of unconstrained electricity production using resources from the Gaza marine Gas field.

In 2013, Palestinians bought 4,484,808 MWh from the Israeli Electricity Company, accounting for 87.3% of purchased electricity (Table 7). According to the World Bank (2007), the cost of producing and transferring a kilowatt of medium voltage for Palestinians through a natural gas-fed power plant would be 0.126 NIS/KWh (0.087 \$/KWh) in contrast to 0.334 NIS/KWh (0.033 \$/KWh) which is the current cost of electricity Palestinians pay to Israel.

Electricity Source	MWh
Israel	4,484,808
Egypt	208,045
Jordan	41,401
PEC	402,607

Table 7. Palestinian imports of Electricity by source (PCBS, 2013)

If Palestinians were to produce the electricity they currently buy from the Israeli Electricity Company, they would save **\$388.92 million, 3.1% of GDP**. The cost of bombing the Palestinian power plant in Gaza has been accounted for in Section 3.1, as part of the cost of the Israeli assault on the Gaza Strip.

3.4 Restrictions on Domestic Movement of Goods and Services

The movement of goods and people within the West Bank has been heavily restricted by Israel for over a decade through a system of check-points, road-blocks and other barriers. The restrictions slow down vehicle traffic and often force traffic to take the least direct route to a

particular location, such as in the case of the Bethlehem-Ramallah route, which cannot go through East Jerusalem. These barriers have been officially established by Israelis for security reasons, however, they are maintained by Israel regardless of the security level in Palestine. (UN OCHA, 2011). These restrictions also affect the quality of agro products (especially fresh fruits and vegetables) that are delayed on checkpoints. ARIJ (2014) estimates that 5-10% of agro products are lost due to spoilage as a result of restrictions on movement of goods between governorates of the West Bank.

These Israeli restrictions are among the most critical constraints on competitiveness, and economic development in the West Bank. They result in huge transportation delays and higher transaction costs that affect the productivity of the public and private sector alike.

In order to estimate these costs we have identified four major routes where restrictions imposed by the Israelis are likely to affect major traffic flows in the West Bank. These routes are:

- ❖ *Bethlehem- Ramallah*: the most direct route to Ramallah is through Jerusalem passing through Qalandia checkpoint, but this route is not permitted to West Bank residents; we compare this direct route with the alternative route through Wadi Elnar which is effectively used by West Bank residents between Ramallah and Bethlehem. We consider Efrata Junction as the starting and the Jaba checkpoint as the ending point with the three different sub-routes allowed:
 - Old Qader
 - Sawahiryia West
 - Sawahiryia East
- ❖ *Jericho- 90*: the normal route from different northern West Bank cities to Jericho is through Hamra and Tayasir check points, as follows:
 - Jenin- Al Jiftilik direct via Tayasir checkpoint
 - Tulkarem and Qalqeilia- Al Jiftilik direct via Hamra checkpoint
 - Nablus- Al Jiftilik direct via Hamra checkpoint
 - Tubas - Al Jiftilik direct via Tayasir checkpoint

However, with the exception of around 56,000 people who are registered as residents of the Jordan Valley (including Jericho), the Palestinians are prohibited from crossing these checkpoints with their private vehicles, unless they have obtained a special permit.¹⁶

¹⁶ Moreover those who obtain these permits are required to have the vehicles licensed in their names before being able to drive them through the checkpoints.

Therefore, we compare these routes with the alternative going through north of Ramallah (route 1).

- ❖ *Ramallah–Jerusalem*: the most direct route is through Qalandia, but this not permitted for West Bank residents; we compare this most direct route as if there were no check-point (as it would be the case in a unified Palestinian state) with the alternative routes:
 - Through Betunia check-point for commercial vehicles
 - Through Hizma check-point,
 - Through Qalandia with the checkpoint
- ❖ *Ramallah-Nablus*: the most direct route to Nablus is through historic segments of Route 60 which is however closed by road blocks. Therefore, the alternative route via Beir-Zeit is considered.

For each alternative, we first compute the extra time and distance driven vis-à-vis the most direct route. We rely on ARIJ mapping of the West Bank routes on the Geographical Information System, as well as on information from the Palestinian Ministry of Economy in order to estimate the timing and the length of each alternative. Table 7.2 presents the length of each route and its alternatives as well as the time taken to travel these routes under normal traffic conditions. The differences are substantial with the alternative route often taking double the time than the direct route. The differences are particularly significant for the Jordan Valley route which is de facto isolated from the north of West Bank.

We then estimate the costs per vehicle due to the extra time and mileage caused by the restrictions. We calculate these additional costs per extra kilometre travelled and per extra minute for six categories of vehicles: private vehicle, taxis, mini-bus, full bus, small, medium and large commercial vehicles (divided in turn into large commercial and full trailer). For each category we estimate the various costs per kilometre, taking into account fuel consumption, maintenance and fixed costs.¹⁷ Table 8 presents the estimates for a private vehicle.

We perform a similar exercise for the cost per minute travelled. First we estimate the average occupancy for the various types of vehicles. Then we compute the opportunity cost of time for each car passenger as well as for the private vehicle's driver on the basis of the GDP per capita for the West Bank in 2010 (estimate in current prices based on PCBS data on GDP per capita in

¹⁷ Fuel consumption is based on figures from the Institute of Transport Studies at the University of Leeds cross referenced with enquiries with car mechanics in the West Bank; maintenance costs and annual travel are averages calculated from enquiries with car mechanics in the West Bank. Fuel and fixed costs are based on data provided by the Palestinian Ministry of Transportation.

constant 2004 US dollars).¹⁸ For the drivers of taxis, buses and commercial vehicles, we base their opportunity cost on the average monthly wage for such occupation (NIS 3,000).

The last piece of information we need is the average vehicles' traffic for each route, which we take from the Ministry of Public Works and Housing. This is measured in different working days of the week for each route and then averaged out, valuing the weekend days as half working day each.¹⁹ We use the shares of traffic by vehicle's type in each route to weigh each type of vehicle's cost. So for instance, if 46% of the traffic on the Bethlehem-Ramallah road via the Old Qedar is taken by private cars, we will weigh the cost of the private car by 46% in the computation of the average cost per vehicle on that alternative. The estimations of the extra costs for the various routes (both in terms of weighted average costs per vehicle and in terms of total overall annual costs) are presented in table 9. Most of the costs arise from the barriers obstructing the Bethlehem-Ramallah connection (diverting traffic through the over-crowded Wadi Nar) due to the heavy volume of traffic and from access to the Jordan Valley from the northern West Bank cities, mainly due to the very long diversion necessary to bypass the barriers. The total annual costs of the main movement and access restrictions considered amount to around **\$185 million**.

Estimation of costs per Km for private car

	Expense	No. of km (100)	Cost (100)	NIS\100km	Sub-total NIS/100 km
Maintenance	Fuel (Petrol)	7.4	6.3	85.1	85
	oil	100	2	2	25
	annual maintenance	120	5	4.2	
	brakes	200	5	2.5	
	body	300	20	6.7	
	tires	350	10	2.9	
	battery	400	5	1.3	
	transmission	500	4	0.8	
	engine	1500	70	4.7	
Fixed Costs	licence / registration	120	7	0.058	18
	insurance	120	1,5	0.125	
Total costs					128

Table 8. Estimates of the costs per vehicle due to the extra time and mileage caused by the movement restrictions

Source: Authors' elaboration on various sources

¹⁸ We divide the GDP per capita (NIS 8,620) by (200 working days x 8 hours x 60 minutes) in order to get the average per minute valuation of time, i.e. NIS 0.09.

¹⁹ Sometimes traffic data does not distinguish between commercial vehicles and between mini- and full buses. In those cases we just distribute the traffic for the macro-category (e.g. commercial vehicle) equally across the sub-categories (small, medium and large commercial). Also, for the Jericho-90 road we only have data for the vehicle traffic without the indication of the specific origins from the various cities in the West Bank. We distribute the traffic by origin according to each city's population.

Route	Length (km)				Time (min)				Annual No. Vehicles ('000)	Tot cost diff ('000 USD)
	Direct	Alternative	Difference	Cost diff vehicle (NIS)	Direct	Alternative	Difference	Cost diff vehicle (NIS)		
Bethlehem–Ramallah										
via Old Qedar	31.8	50.3	18.5	32.8	39.5	75.5	36.0	9.3	1,888.1	22,895
via Sawahiryia West	31.8	49.5	17.8	29.5	39.5	87.0	47.5	12.9	929.0	11,356
via Sawahiryia East	31.8	49.2	17.4	32.2	39.5	89.0	49.5	15.4	1,497.3	20,519
Jericho-90										
Jenin – Al Jiftlik	57.7	172.9	115.2	210.7	72.5	126.5	54.0	19.21	455.8	30,186
Tubas – Al Jiftlik	39.4	137.5	98.1	179.5	50.5	101	50.5	17.97	86.6	4,926
Tulkarm – Al Jiftlik	57.9	162.2	104.3	190.7	82	119	37.0	13.17	281.0	16,497
Qalqiliya – Al Jiftlik	53.5	159.2	105.7	193.3	67	117	50.0	17.79	178.9	10,881
Nablus – Al Jiftlik	32.7	135.9	103.2	188.7	49.5	113	63.5	22.59	597.4	36,350
Ramallah –Jerusalem										
via Betunia (comm.)	14.8	21.1	6.3	25.5	25.5	58.0	32.5	10.2	22.7	233
via Hizma	14.8	27.4	12.6	18.7	25.5	43.0	17.5	3.7	2,349.5	15,167
via Qalandia (w/o CP)	14.8	14.8	0.0	0.0	25.5	55.0	29.5	8.1	2,417.7	5,621
Ramallah- Nablus	51.0	55.0	4.0	1.9	59.0	64.5	5.5	4.2	5,639.9	9,888
Total										184,517

Table 9. Differences between normal routes and their alternatives (with obstacles) from the main routes in the oPt. (Author's elaboration on various sources)

4. Industries and Services

The industrial sector plays a major role in economic growth and development. Yet, investment in the industrial sector in Palestine has been relatively restricted due to high risk resulting from political instability, weak infrastructure, and restricted access to natural resources on which many industries are based. Due to Israeli restrictions, the potential of many industries such as mining and quarrying are not fully explored. Furthermore, restrictions on movement and weak infrastructure resulting from occupation do not allow for Palestinian industries limits their productions' possible regional and international expansion. The cost of the Israeli restrictions on the industrial and services sector is estimated at \$ 1,554.7 million.

4.1 Mining and Quarrying

Dead Sea salts and minerals

The Dead Sea is rich in Salts and minerals, but only some of them have a particularly high commercial value and have been extracted in large quantities by both Israeli and Jordanian companies for many decades. The Dead Sea lies between the West Bank, Jordan and Israel but the West Bank side is entirely lying within area C. Access to the Dead Sea is completely sealed off for Palestinians as far as economic activities are concerned. For the Palestinian economy, this represents a loss proportional to the potential economic value from the exploitation of these resources.

Three types of salts make up most of the Dead Sea economic resources: Potash, Bromine, and Magnesium. Potash is primarily used to produce agricultural fertilizers. Bromine is used as flame retardant, pesticide and in some other minor applications such as a gasoline additive as well as medical and veterinary products. Magnesium is used in industrial applications, such as de-icing roads and in textile and cosmetics industries. The high concentration of these minerals and other salts in the Dead Sea make the extraction process a highly profitable endeavor. Israeli Chemicals Ltd (ICL) - a chemical Israeli multinational - is the largest company extracting these resources in the southern basin of the Dead Sea. According to the company (ICL, 2011), the cost of production of Potash and Bromine from the Dead Sea is

lower than the cost faced by other producers in the world. A significant part of ICL operational advantages in the international markets derive from the characteristics of the Dead Sea, particularly its high concentration of minerals and the relatively low cost of their production compared - for example - with mining Potash from underground deposits or extracting Bromine from less concentrated sources. Moreover the hot and dry climate of the Dead Sea allows the storage of large quantities of Potash in open areas at particularly low cost. These appealing characteristics would make the development of a chemical industry in the Palestinian Dead Sea potentially viable if Israeli restrictions were lifted.

In order to estimate the potential economic value of these resources, we took the recent annual production of the three main Salts - Potash, Bromine and Magnesium - by Israel and Jordan (table 10) and evaluated it at international prices. The extraction of these Salts in Israel and Jordan is almost entirely concentrated in the Dead Sea. Potash is by far the most valuable Salt in the Dead Sea and both Israel (through ICL) and Jordan (through Arab Potash Company) are large producers by international standards. In 2010, Israel extracted around 4 million metric tons of Potash from the Dead Sea for an approximate value of almost USD 1.5 billion, while Jordan extracted almost half of that amount (Table 5.1). By taking a conservative estimation approach, we assume that Palestinian production of salts and minerals will range between that of Jordan and Israel. Accordingly, if Palestinians had free access to their share of the Dead Sea and were allowed to invest in and develop their mining industries, their production value could range between **\$917.70 million and \$2,366.40 million, or the equivalent of 7.2% - 18.6% of 2014 Palestinian GDP**. Hence, the average potential production would equal **\$1,642.05 million, or 12.9% of GDP**. Access to Dead Sea salts and minerals will also allow Palestinians to invest in the cosmetic industry with the potential to generate even more revenue.

	Israeli production (in metric ton)	Jordanian production (in metric ton)	Price (USD per metric ton)
Bromine^a	128,000	0	2,782
Potash^b	4,000,000	1,900,000	483
Magnesium^c	29,000	0	2,700
Total ('000 USD)			

Table 10. **Dead Sea economic potential: production of Salts.** ^aData for quantities for 2009, and for prices for 2010; data for quantities for 2010 and for price three-year (2008 to 2010) average benchmark price; ^c data for quantities and price for 2009. Source: Elaborations of the authors based on Arab Potash Company (2011); Gulf Resource, United States Geological Survey Mineral Resources Program.

Quarries

The West Bank territory is also rich in gravel and stone. Gravel and stone including marble currently represent the major merchandise export of Palestine. Most of the mines and quarries from which these materials are extracted are located in area C and are under direct Israeli control. However, Israeli often restricts the development of the Palestinian mining industry while facilitating the extraction of gravel and stone by Israeli companies. The Israeli human rights organisation Yesh Din (2009) presented a petition to the Israeli high court detailing the use of products from mining in the West Bank and their contribution to the Israeli economy. Yesh Din used a document by the Israeli Ministry of Interior's Planning Administration (GOI, 2008) which analysed the future reserves of mines in the West Bank. According to the document, the quarries in Area C produce the largest amount of mining and quarrying material for Israel, mainly gravel.

Many of the mines and quarries in Area C are owned by Israeli companies and operate under the permits and supervision of the legal authorities in the Civil Administration in Judea and Samaria. Israeli firms, a number of them operating as subsidiaries to international corporations, yield an income of almost one billion NIS annually or approximately USD \$250 million from quarries located in the West Bank.²⁰ Of that total amount, 2.5 per cent is

²⁰ Jonathan Cook (2014) The Nakba Continues Israel Continues Its Theft of Palestinian Natural Resources, Washington Report on Middle East Affairs.

granted as royalty to the Israeli Civil Administration.²¹ The remaining 97.5% is funneled directly into the Israel economy. The Palestinian Authority does not receive any economic benefits from these enterprises.

Although the Israel High Court of Justice originally ruled that Israel was committing resource theft under the *Hague Regulations (1907)*,²² it reversed its opinion in 2011. Approximately a dozen firms extract stone for construction from West Bank quarries at an annual loss to the Palestinian economy of \$900 million.²³

USM (2011) reported that the value of stone reserves is estimated at \$30 billion. It also reported that “total annual revenue of this industry is estimated at \$450 million, 65% of which comes from exports to Israel and about 15% come from direct exports to international markets (USM Statistics) and 20% in the local market. However, a significant percentage of the Israeli share is re-exported to other markets.” Despite the industry’s huge potential, its production is limited due to Israeli restrictions in area C. Many Palestinian quarries are not licensed by the Israeli Civil Administration, and continuously face machinery and vehicle confiscation. According to World Bank (2014), “evidence collected from several companies reveals penalties ranging from 40,000 to 120,000 New Israeli Shekels”, due to lack of licensing. The World Bank (2009) also estimates that the opportunity cost of restricted Palestinian access to quarrying sites in Area C is **\$241 million** of potential added value, or **2% of GDP**. This can be viewed as a conservative estimation since this figure does not account for the multiplier effect of this industry on Palestinian employment, and the loss of potential revenue from investments in other related industries such as stone crushing and production of building materials.

4.2 Banking

The financial sector in Palestine is mainly managed by the Palestinian Monetary Authority (PMA). The PMA is “an independent public institution responsible for the formulation and implementation of monetary and banking policies.” (PMA, 2011) Despite this, PMA has a

²¹ IBID.

²² HCJ 2690/09, *Yesh Din et al., v. Commander of IDF Forces in the Judea and Samaria et al.* (2010)

²³ IBID.

restricted authority and sovereignty over its monetary policy given that it does not issue a national Palestinian currency. Israel has managed to impose more control over Palestinian economy through the circulation of New Israeli Shekel (NIS) in the Palestinian market. Many agree that “this Israeli policy aimed to facilitate the process of integration of the Palestinian economy into that of Israel, not to mention the substantial seigniorage revenue Israel derives from the circulation of the shekel in the territories.” (Palestine-Israel Journal, 1999). And although Article IV of the Paris Economic protocol suggests that “both sides will continue to discuss, through the JEC, the possibility of introducing mutually agree Palestinian currency or temporary alternative currency arrangements for the Palestinian Authority”, no progress has been achieved in this regard. (Paris Economic Protocol, 1994)

In addition to the abovementioned restrictions, the Palestinian banking sector bears many other costs imposed by Israel. RAND report (2014) estimates these costs at **\$15 million** annually. This includes “the requirement that Palestinian banks must work through an Israeli bank to clear shekels, must hold large collaterals (approximately NIS 1 billion) to access clearing services, and must pay Israeli banks commissions for the service.” (RAND, 2014)

4.3 Agriculture

The Urbanization Monitoring department at the Applied Research Institute – Jerusalem estimates that about 2.5 million trees have been uprooted since 1967. The Israeli policy of uprooting trees has been executed for a number of reasons, including the construction of Israeli settlements, the construction of the separation wall, and settlements infrastructure; all of which exclusively benefit the settler population.

Besides representing an irreparable loss to Palestinians' natural and cultural heritage, Israel's policy of tree uprooting also deals economic damages. The vast majority of uprooted trees have been fruit bearing trees; thus the uprooting has deprived Palestinian of a valuable source of income, and has affected overall agricultural production thus affecting food security of Palestinian households.

The annual loss for the Palestinian economy is the forgone value of potential agricultural production of the uprooted trees. Since no specific data is available on the types of fruit trees

that have been uprooted, a model that includes all fruit trees grown in Palestine has been developed. The value of production of each type has been derived based on its percentage from the total number of all fruit trees.

Accordingly, the annual forgone value of agricultural production due to uprooting of trees is \$25,230,407.9 (table 11). Given that this has been derived from the value of production in 2008, the actual value in 2015 would be \$29,465,921.4 taking inflation into consideration. The foregone added value from agricultural production of uprooted trees is **\$23 million**, accounting for **0.2% of GDP**.

	2014 Area (dunum)	2008 Area (dunum)	2008 Production Value (\$)	Value per dunum (\$/dunum)	# Tree/dunum	Value per tree (\$/tree)	# Trees (2014)	Trees (% of total number of trees)	Forgone Value (\$)
Akadenia	442.8	602.0	640.0	1,063.1	37.2	28.6	16,453.1	0.1%	56,152.9
Almond (hard)	21,203.3	29,165.0	3,853.0	132.1	37.2	3.6	787,829.1	3.8%	334,126.2
Almond (soft)	16,048.2	15,140.0	18,260.0	1,206.1	40.0	30.1	642,681.7	3.1%	2,308,728.8
Aloc	1,607.2	5,154.0	3,418.0	663.2	48.2	13.7	77,532.3	0.4%	127,132.8
Apple	2,710.5	2,448.0	1,034.0	422.4	44.1	9.6	119,401.1	0.6%	136,559.4
Apricot	4,730.7	5,352.0	1,808.0	337.8	37.7	9.0	178,399.6	0.9%	190,625.9
Avocado	603.0	130.0	316.0	2,430.8	35.2	69.0	21,237.7	0.1%	174,836.5
Balady Orange	37.0	20.0	36.0	1,800.0	62.0	29.0	2,291.6	0.0%	7,933.4
Banana	1,103.5	1,680.0	3,915.0	2,330.4	91.9	25.4	101,378.8	0.5%	306,736.8
Bomaly	194.7	129.0	37.0	286.8	42.5	6.8	8,269.9	0.0%	6,659.8
Cherry	1,692.0	2,287.0	2,024.0	885.0	43.2	20.5	73,173.3	0.3%	178,617.3
Clement	2,953.3	2,587.0	3,043.0	1,176.3	46.0	25.6	135,869.7	0.6%	414,359.0
Custard apple	22.0	42.0	211.0	5,023.8	43.0	116.8	946.2	0.0%	13,183.4
Date	19,345.5	7,898.0	3,836.0	485.7	17.9	27.1	346,346.9	1.7%	1,120,761.3
Fig	6,123.1	14,357.0	7,928.0	552.2	18.1	30.6	110,528.2	0.5%	403,312.7
Francawy Orange	331.0	202.0	130.0	643.6	68.1	9.5	22,531.8	0.1%	25,409.2
Grape	49,304.0	74,003.0	44,129.0	596.3	82.6	7.2	4,072,699.7	19.4%	3,506,938.2
Grapefruit	396.4	560.0	478.0	853.6	43.6	19.6	17,265.2	0.1%	40,360.4
Guava	5,817.6	2,927.0	3,790.0	1,294.8	40.3	32.1	234,551.5	1.1%	898,525.9
Lemon	9,844.0	7,410.0	23,463.0	3,166.4	47.4	66.8	466,957.3	2.2%	3,717,968.9
Mandarin	245.9	327.0	317.0	969.4	39.0	24.8	9,600.2	0.0%	28,434.2
Mango	398.5	236.0	433.0	1,834.7	22.1	82.9	8,818.6	0.0%	87,211.8
Navel Orange	3,783.9	2,541.0	3,603.0	1,417.9	56.8	25.0	215,032.3	1.0%	639,989.1
Nectarine	206.6	67.0	25.0	373.1	40.0	9.3	8,264.0	0.0%	9,195.3
Olive	622,433.0	950,666.0	94,704.0	99.6	18.9	5.3	11,776,427.5	56.2%	7,396,120.3

Other Citrus	582.9	139.0	118.0	848.9	58.3	14.6	33,988.9	0.2%	59,019.4
Others	499.1	97.0	154.0	1,587.6	38.8	41.0	19,341.1	0.1%	94,510.8
Others Stone Fruit	81.3	444.0	118.0	265.8	38.8	6.9	3,150.3	0.0%	2,577.0
Peach	5,594.5	3,368.0	1,067.0	316.8	47.4	6.7	265,311.2	1.3%	211,407.7
Pears	421.4	600.0	212.0	353.3	54.6	6.5	23,006.2	0.1%	17,758.6
Pican	105.5	88.0	138.0	1,568.2	36.3	43.2	3,834.0	0.0%	19,734.2
Plum	9,325.7	23,608.0	7,641.0	323.7	48.1	6.7	448,657.0	2.1%	360,032.0
Pomegranate	1,395.5	1,450.0	526.0	362.8	52.9	6.9	73,785.3	0.4%	60,381.4
Poppy	4,490.5	1,937.0	1,520.0	784.7	57.6	13.6	258,543.1	1.2%	420,319.6
Quince	747.5	402.0	197.0	490.0	27.4	17.9	20,481.9	0.1%	43,695.2
Shammoty Orange	2,211.9	3,136.0	6,815.0	2,173.2	65.8	33.0	145,513.7	0.7%	573,363.8
Sumak	238.3	632.0	319.0	504.7	38.0	13.3	9,055.4	0.0%	14,347.3
Valencia Orange	4,351.0	10,140.0	23,236.0	2,291.5	44.8	51.2	194,726.0	0.9%	1,189,278.4
Walnut	289.2	405.0	506.0	1,249.4	17.4	71.7	5,042.8	0.0%	43,103.2
Total	801,911.6	1,172,376.0	263,998.0				20,958,924.3		25,239,407.9

Table 11. Annual forgone value of agricultural production due to uprooting of trees (Author's elaboration based on PCBS data on area and production value (2010))

4.4 Tourism

Palestine is known for its historic, religious, and natural heritage and sites, yet the development of the tourism sector has been restricted by the Israeli occupation's access restrictions and control, especially in area C. According to the World Bank (2010), tourism development in area C could include the Dead Sea, the Jordan River, and the Jordan Valley slopes, as they offer a unique combination of health, leisure, sport/adventure, ecological, agricultural and religious destinations in one area. Other touristic sites are also under Israeli control given their location in area C. As a result, Palestinians are restricted from investing in these sites, and are therefore losing a huge source of revenue for the economy, that could create jobs for thousands of Palestinians.

Given its unique features, its worldwide fame, and its location, the Dead Sea would be key to the development of tourism in the West Bank. Its proximity to the baptism site on the Jordan River, and to the Jordan Valley and Jericho desert give it a special advantage. In order to measure the cost of occupation on Palestinian tourism, this report focuses on the forgone revenue from investment in Dead Sea tourism, using Jordan's Dead Sea tourism as a benchmark. Tourism in the Jordanian share of the Dead Sea has noticeably developed in

recent years. The Jordanian Ministry of Tourism & Antiquities (2015) reports show that in 2014, 327,417 local and international visitors stayed at Dead Sea hotels, with an estimated total of 581,269 of night stays (Jordanian Ministry of Tourism and Antiquities, 2015). Using an estimate of \$100 price for hotel stay per night, and using a conservative estimation that Palestinian Dead Sea tourism would have generated arrivals equal to 20% of that on the Jordanian side, it is estimated that Dead Sea tourism has a forgone revenue of \$56.11 million from hotel stays only. This is a very conservative estimation, given that tourism is not limited to the hotel industry in the Dead Sea only.

4.5 Telecommunications

The contribution of the services sector – including telecommunications – in Palestinian GDP has been growing over the past years. Despite this growth, the telecommunications sector has been facing many challenges due to restrictions imposed by the Israeli occupation. In area C, Israel restricts building cellular infrastructure – especially towers, thus limiting the reach of Palestinian cellular networks. According to the World Bank (2014), this has resulted in 77% cellular penetration in the West Bank, “much lower than the Middle East and North Africa average of 123 percent.” Similar restrictions are faced by Paltel – the main landline operator in Palestine. “Paltel reports that almost 40% of its area C permit requests are rejected” (World Bank, 2014), which has led to higher service fees for all customers, given lack of infrastructure in area C located between area A and B. Furthermore, Israel has restricted Palestinian cellular companies from access to 3G and 4G frequencies until recently, giving competitive advantage for Israeli telecommunication companies that offer such services at competitive prices. This has affected the industry’s potential heavily, because “the demand for such services among Palestinian customers has been on the rise as the number of smart phone users in the Palestinian territories grew from 3 percent in 2010 to 17 percent over the last two years, even though they currently cannot access full features of the phone nor use mobile broadband.” (World Bank, 2014) On 19 November 2015, an agreement was signed between the IDF and Palestinians, allowing the 2 mobile companies access to 3G high-speed mobile internet. “The new services are expected to go into effect in mid-2016.” (The Jerusalem Post, 2015)

According to World Bank (2014), restrictions on the telecommunications industry in Palestine has an estimated added value of **\$48 million**.

4.6 Export and Import Restrictions

Israel imposes a variety of restrictions on the trade to and from the West Bank and Gaza.

These restrictions lead to different types of costs, which we divide into two main categories:

- a. Lack of availability and higher cost of production inputs due to restrictions imposed on the import of ‘dual use’ item list.
- b. Costs of the restrictions on handling, processing and transporting exports.

Inputs to production (dual-use item list – for the West Bank)

‘Dual-use’ items are goods, raw materials, equipment and spare parts that have both civilian use as well as potentially other harmful uses. Israeli restrictions on dual-use chemicals and fertilizers have been in place for decades, but in 2002, the Israeli military began limiting access to chemicals and fertilizers further by lowering the maximum concentration levels allowed. Since 2002, the Government of Israel (GoI) has progressively added materials, machinery, and equipment (including telecommunications equipment) to the list of items considered “dual-use.” In 2008, as part of the new Defence Export Control Law, a new list was approved by MoD that includes 56 items.²⁴ The latter includes; fertilizers, chemicals and raw materials for industry, steel pipes, lathe and milling machines, optical equipment, and navigation aids, amongst others.

To control imports by Palestinian businesses, the GoI has established a system of bureaucratic controls that require the GoI to authorize their transfer to the West Bank. The system requires the importers to obtain a license in order to import the dual use items; however, most companies fail to get the license. These restrictions limit Palestinian access to dual use goods as they need GoI authorization for the transfer. The authorization is obtained through an application process for permits and licenses, but the authorization for many goods is so rarely obtained that, in effect, the goods are banned.

²⁴ The complete list is presented in Appendix 1.

Recent work carried out by the Trade Facilitation Project (TFP) identified key problems that severely restricted the authorisation process²⁵: (1) The list and scope of restricted dual use goods has been increasing despite an environment of improved security; (2) the lack of specificity regarding the items causes uncertainty and confusion; (3) there is no easy access to information on dual use goods (e.g. even toothpaste which contains a small percentage of nitric acid would not be allowed, but an exception is made because it is a humanitarian item); (4) military orders do not explain the application process or establish timelines for processing applications, taking decisions and resolving disputes; (5) the Exceptions Committee meets infrequently and with unclear timelines and there is limited staff at the Israeli civil administration in Bet El to process applications (only one clerk to process requests for the whole of the West Bank which results in further delays).

Under this system, the process of handing out permissions must be repeated for every truckload of dual-use items, even for the same type of goods. In addition, there are some imports which are strictly prohibited from entering the West Bank and Gaza, such as glycerine and lathe machines (PALTRADE, 2010).

These restrictions raise the costs of inputs, and/or force companies to use an inefficient input mix of production and/or prevent companies from producing altogether especially when a prohibited import is a necessary input to production. Box 1 illustrates some examples of how these restrictions affected specific companies.

Three major macro-sectors are affected by the “dual use” item related restrictions at the agricultural industrial and ICT sectors. For the latter two we base the estimation of costs on TFP’s work. We compute our own estimates for agricultural costs. On the other hand, the work from TFP only captures the direct costs of the restrictions, i.e. the extra costs faced by the firms in their production due to the import restrictions. These are likely to involve the foregone revenue from production. This can be the case when existing companies cannot expand production due to their lack of competitiveness (stifled by restrictions) or even when potential companies cannot come about altogether as the costs of production is too high vis-à-vis the market due to the restrictions.

According to TFP’s work, dual use items affect the following industrial sub-sectors: food, beverages, metal, pharmaceuticals, textiles, leather, paints, detergents and cosmetics. Items of

²⁵ The results from the work were presented at the Ministry of National Economy in September 2010 and are available from Ministry of National Economy (2010).

relevance to these sub-sectors include: hydrogen peroxide, nitric acid, sulphuric acid, glycerine, metal pipes, etc. For example, Ultra-high temperature processing (UHT) milk requires hydrogen peroxide for sterilization. As the required 35% concentration cannot be procured, the companies use an inferior concentration (17%) which decreases the shelf life of the milk from 1 year to less than 6 months and leads to a higher percentage of spoiled goods.²⁶ In another example, companies that need to use nitric acid to clean pipes from grease have to use different chemicals which are less effective and require that the pipes be replaced much more frequently. ICT companies are also affected by dual use restrictions due to the extra costs related to the restrictions to import certain telecommunications devices (such as switches, which had to be placed in London, and more recently in Jordan) and technology (such as 3G technology), which increase their overall operating costs. The TFP work estimates annual direct losses from such restrictions at about \$60 million for industry and \$60 million for ICT.

In the agriculture sector, GoI imposes a number of restrictions on the type of fertilizers which can be imported by Palestinian farmers. There are a number of fertilizers that Palestinians cannot import (see complete list in Appendix 1), but we analyse only the extra costs of the banning of three main types that we believe capture a significant share of the overall costs of dual use item restrictions on agriculture, those are:

- Compound solid 20:20:20 fertilizer (20% of nitrogen, 20% phosphate and 20% potash)
- Urea ($\text{CH}_4\text{N}_2\text{O}$);
- Potassium nitrate (KNO_3).

We compare the costs incurred by Palestinian farmers from using the appropriate but banned fertilizers vis-à-vis the costs of using the currently permitted yet insufficient ones. This comparison yields two types of costs: a direct cost resulting from higher prices and lower productivity, and indirect costs from the loss of land productivity on the long term due to fertilizers inefficiency.

The main alternatives for the banned solid 20:20:20 fertilizer are fertilizer 13:13:13 or the liquid fertilizer. These fertilizers are currently used for irrigated vegetable crops (both protected and open) as well as for fruit trees (which are mainly rain-fed in Palestine). The

²⁶ Based on interviews with companies as well as sector experts.

only company that produces fertilizers with the 13:13:13 concentration is a plant in Haifa. We identify the recommended quantity of fertilizers in terms of kg/dunum/year in order for each type of crops to receive the correct dosage of the various nutrient elements (Table 3.1). Since the 20:20:20 fertilizer has a higher concentration of nitrogen, phosphate and potash per kilo than the 13:13:13 fertilizer, one would need to apply more of the latter than the former to have the same production quantity per dunum. This results in extra costs for the farmers (Table12).

The same is also true when comparing 20:20:20 fertilizer to the other alternatives, i.e. liquid fertilizer, as well as when comparing Urea (which is banned) vis-à-vis Ammonium Nitrate (NH_4NO_3) fertilizers, although in these cases the fertilizers are only applied to the irrigated vegetables production. On the other hand, potassium nitrate and potassium sulphate (K_2SO_4) contain similar amounts of the necessary chemicals (thus the recommended quantity per dunum is the same) but potassium nitrate (banned) is cheaper than potassium sulphate; this again creates an extra cost for Palestinian farmers.

Type of crops	Cultivated ²⁷ Area (dunum)	Fertilizer use ²⁸ (kg/dunum)	Cost (\$/kg)	Fertilizer use (kg/dunum)	Cost (\$/kg)	Cost Difference (\$million)
		20:20:20		13:13:13		
Protected Irrigated Vegetables	50,315.00	250.00	1.77	400.00	1.25	2.88
Open field Irrigated Vegetables	132,747.37	100.00		200.00		9.65
Rain-Fed Fruit Trees	603,630.59	20.00		30.00		1.25
Total						13.78
Type of crops	(dunum)	20:20:20		Liquid compound fertilizer		
Protected Irrigated Vegetables	50,315.00	250.00	1.77	750.00	1.04	16.99
Open field Irrigated Vegetables	132,747.37	100.00		600.00		59.31
Total						76.29

²⁷ MoA, 2012

²⁸ ARIJ Agriculture Department, 2011

Type of crops	(dunum)	CH4N2O		NH4NO3		
Protected Irrigated Vegetables	50,315.00	163.00	0.83	135.48	0.60	2.95
Open field Irrigated Vegetables	132,747.37	125.00		103.90		6.03
Total						8.99
Type of crops	(dunum)	KNO3		K2SO4		
Protected Irrigated Vegetables	50,315.00	130.00	0.62	130.00	1.45	5.44
Open field Irrigated Vegetables	132,747.37	100.00		100.00		11.03
Total						16.47

Table 12. Cost comparisons between banned vs. permitted fertilizers

Since no data is available on the actual combination of fertilizers used by Palestinian farmers, we assume that the 4 varieties of fertilizers for irrigated vegetables (protected and open) are used equally for each 1 dunum of land (25% of each for 1 dunum). Accordingly, the direct cost from restrictions on importing fertilizers is **\$29.82 million**.

In addition to creating this extra direct cost, the use of inefficient fertilizers has a negative indirect impact on agricultural production, by reducing the productivity of land. For example, the 13:13:13 fertilizer is only composed of 39% of nutrient materials (nitrogen, phosphate and potash) and 61% of inert material, mainly salt, as opposed to the 20:20:20 fertilizer that contains only 40% of inert materials. In addition, and as mentioned earlier, farmers need to use the 13:13:13 fertilizer more intensely per dunum of cultivated land due to its lower concentration of nutrient elements. These factors result in a much higher injection of inert materials into the soil, thus substantially increasing soil salinity, leading to soil deterioration and a reduction in productivity.

Similarly, the plants require potassium nutrients for their growth especially during the fruiting stage. This improves the quality of fruits and ensures a longer shelf life. This is usually compensated by the addition of potassium fertilizers to the soil. As potassium nitrate is banned for Palestinians (yet settlers are allowed to use it in the Jordan Valley), the alternative for Palestinian farmers is to use potassium sulphate with a higher price per unit.

Furthermore, the plants also require nitrogen-rich fertilizers for their growth especially during the early stages of their life. As urea (which contains 46% of nitrogen) is banned by the GoI (again only for Palestinians but not for Israeli settlers in the West Bank), the Palestinian farmers have to use ammoniac fertilizers which has a lower concentration of nitrogen (21%). Therefore, farmers have to use higher quantities of fertilizers to get the required nitrogen nutrient than in the case of urea. In addition to being more expensive, using ammoniac fertilizers adds more inert material to the soil than urea; negatively affecting land productivity and soil properties.

Through surveys with farmers, we estimates that the use of permitted yet inefficient fertilizers is lowering land productivity by 20-25%. Farmers in the Jordan Valley have witnessed this reduction in productivity over a period of 7 years, during which the only change to their farming practices was using the 13:13:13 permitted fertilizer instead of the 20:20:20, which was banned by Israel by then. This finding is supported by the findings of a USAID-funded project quoted by TFP's work on dual use items, during which farmers in the Jordan Valley were allowed to use the suitable fertilizers as opposed to other farmers using the inefficient permitted types. According to the project findings, production increased by one third relative to the previous season (MoNE, 2010).

Based on these findings, restrictions imposed on importing fertilizers are indirectly affecting Palestinian agricultural production. The production value from irrigated vegetables (protected and open) and rain-fed fruit trees – for which banned fertilizers are used – is estimated at \$417.79 million²⁹, of which \$83.56 million (20% of total value) is lost due to the use of inefficient fertilizers. Foregone added value from this agricultural production is therefore **\$65.22 million**. The total direct and indirect cost of restrictions on fertilizers imports within the agricultural sector is therefore **\$95.04 million**, and the total cost of dual use item list restrictions is **\$215.04 million**.³⁰

Export processing costs

Israel imposes particularly burdensome procedures on Palestinian imports and exports under the pretext of security. These procedures and regulations directly raise the costs of trading for Palestinian businesses. “Doing Business” database of the World Bank records the time

²⁹ Author's calculations based on MoA 2008

³⁰ Includes cost of inputs and foregone revenue from industries, ICT, and agriculture.

and cost associated with the logistical process of exporting and importing goods. Based on World Bank data, border and documentary compliance procedures imposed on Palestinian exporters are 2.6 times those imposed on Israeli exporters (125 vs. 49 hours) (Table13).

	Exports			
	Israel		WB & G	
	Duration (hour)	Cost (\$)	Duration (hour)	Cost (\$)
Border compliance	36	150	73	196
Documentary compliance	13	73	52	288
Total	49	223	125	484

Table 13. Time and cost associated with the logistical process of exporting and importing goods. World Bank (2015)

The cost of delays on exports have been discussed by Djankov et al. (2010). They found that trading time delays reduced Palestinian exports by 1.3% for every additional day. Based on table 13, Palestinian exports are delayed 3.17 days (76 hours) due to regulations in comparison with Israeli exports. The daily opportunity cost from delays is estimated at \$0.106 million, adding up to **\$38.85 million** annually.

The total cost of Israeli restrictions on international trade is estimated at **\$253.89 million**, accounting for **2% of GDP**.

5. Human Capital

Human capital is a major driver of economic growth and development. Restrictions discussed for the purpose of this study on human capital development and workers' rights by Israel include imprisonment of Palestinians for political reasons, and deductions from Palestinian workers in Israel.

5.1 **Palestinian prisoners in Israel**

According to Addameer, there were 6,700 Palestinian political prisoners in Israel as of October 2015. Many of these prisoners suffer from medical negligence, and many of their families are left without the household head. In order to support prisoners and their families, the PA provides prisoners' families with monthly stipend, estimated by RAND report (2014) at **\$200 million**. Political imprisonment of Palestinians by Israel has many other costs and repercussions on the Palestinian economy. It captures the potential contribution of thousands of Palestinian to the national economy, and even when imprisonment ends, previous prisoners have to adapt to the new realities they face.

5.2 **Deductions from Palestinian workers in Israel**

The Israeli occupation of the West Bank and the blockade imposed on Gaza have a double effect on the Palestinian labor market. In fact, if on the one hand this situation contributes to the stagnation of the total employment inside the West Bank and Gaza, on the other it bolsters a context in which the Palestinian workers increasingly depend on the integration between the Israeli and the Palestinian economies. As such, due to the lack of employment opportunities inside the occupied Palestinian territories, the access to the Israeli labor market (Israel and its illegal settlements in the West Bank) constitutes a fundamental relief valve for many Palestinian workers. To quote a report by the International Labour Office, "Palestinian [labor] flows to Israel remain a critical outlet

and source of income in the absence of a greater absorptive capacity of the Palestinian economy.”³¹

As of 2013, Palestinian workers in Israel constituted 11.2% of the Palestinian labor force (PCBS, 2013). According to the Department of Payment, today attached to the Ministry of Interior, Palestinian workers in Israel should be equally paid as Israeli workers, with the same deduction obligations for social welfare and other benefits. According to Zohar & Hever (2010), “in upholding its obligation to deduct money from the Palestinian wages, the Department was stringently meticulous. However, in upholding its obligation to provide workers with services and benefits in exchange for these deductions, the Department was negligent.” These annual deductions have been accumulating since 1970. Calculations based on those calculated by Zohar & Hever (2012), suggest that Israel owes Palestinian workers in Israel **\$ 1,414 million**. This includes the annual deduction amount, in addition to the accumulating deductions from 1970 with an annual interest rate of 5%. These remittances would have been expected to at least support the livelihood situation of many households.

³¹ International Labour Office, *The situation of workers of the occupied Arab territories*, International Labour Conference, 103rd Session, 2014, p. 13 [hereinafter *ILO Report*]. Working in Israel or in the settlements entails higher wages. According to the Palestinian Central Bureau of Statistics (PCBS), in 2014 the average daily wage of Palestinians working in Israel and in the settlements amounted to NIS 187.5, compared to NIS 90.9 and NIS 63.9 for their counterparts working in the West Bank or in Gaza respectively. PCBS, *Labour Force Survey Annual Report 2014*, table 46 [hereinafter *PCBS Report*].

6. Fiscal Cost and Fiscal Revenue Leakage

As an occupied country, Palestine does not enjoy any control over international borders. In addition Israel does not allow any presence of PA officials at these borders. This generates a situation whereby Israel has complete control over the tax and customs clearance revenues accruing to Palestine, which it collects on behalf of the PA.³² However this system of collection is ridden with problems, which create significant fiscal leakage and damage the fiscal viability of the PA.

First, taxes on Palestinian imports from outside Israel are based on a declaration of value from the importer which is often an under-estimation of the true value of the goods. Except for the second-hand car imports Israeli restrictions make it impossible for Palestinian customs to double-check the real value of the goods, which leads to a lower collection of tax revenues from imports than in the case of a sovereign Palestinian state.

Second, the PA has no control over the borders between Israel and the Area C of the West Bank. The collection of VAT on the goods imported from Israel into through Area C is based on self-declaration by the importer, which again leads to an incomplete collection of VAT.

In addition not all of the goods imported from Israel are “real” imports. A substantial portion of these imports are produced in a third country and then re-exported to the oPt as if they had been produced in Israel. This is the case as the cost of importing to Israel (and then to Palestine) is usually lower than trying to import directly to Palestine, as imports to Palestine face much longer checks and higher costs than imports to Israel.

The last direct way in which the occupation reduces fiscal revenues of the PA is via allowing domestic VAT tax evasion in Area C. As the PA does not control this area, a lot of smuggling and black market selling occur there which is effectively not subject to any taxation.

UNCTAD (2014) estimated that total fiscal leakage from Palestinian Authority to Israel due to the aforementioned reasons was **\$319.7 million** in the year 2012. UNCTAD explains that

³² Israel has often used this position to threaten the PA by withholding of clearance revenue, creating huge uncertainty for the PA fiscal space.

the economic repercussions of this leakage are equivalent to 10,000 jobs per year (UNCTAD, 2014).

Further Repercussions

In the previous sections, this report has intended to calculate – to the extent possible with available data – the direct and indirect cost resulting from Israeli occupation to Palestine, and the restrictions imposed as a result. Yet, it is important to highlight that these sectors are not independent of each other, and the impact of inter-sectoral effects cannot be neglected. The impact of sound infrastructure - as in improved agricultural roads for example - are expected to have a positive impact on the agricultural sector, thus affecting food industries.

Sector development and its repercussions on other sectors have been intensively researched, and evidence has been found. Alatawneh (2013) examined the role of agricultural in economic growth in Palestine, and calculated the growth multipliers of agriculture on other non-agricultural Palestinian sectors. He concludes that “a hypothetical \$1.00 increase in agricultural income ultimately adds \$1.53 to GDP. Similar shocks to income in the manufacture, non-manufacture and service sectors increase total GDP by \$1.52, \$1.30 and \$1.63, respectively” (Alatawneh, 2013). His findings indicate that the Palestinian agriculture and services sectors have “the highest multipliers in absolute term” (Alatawneh, 2013).

These linkages and multipliers can be further expanded and researched to account for the resulting indirect losses resulting from direct and indirect losses to each sector discussed within the scope of this report.

Conclusion

The report reflects the deep impact of the Israeli occupation and its restrictions on the different aspects of the Palestinian economy. The resulting direct costs and opportunities lost are aggravated given the interrelations between all sectors, and is dependent on the degree of correlation.

Within its scope, the report estimates that the Israeli occupation is costing the Palestinian economy **\$9,458.8 million annually**. The biggest share of these losses are in the infrastructure sector, representing 35% of total costs, 28% due to restrictions on access to natural resources, 17% due to human capital losses, 16% from the different Palestinian industries and services, and 3% as fiscal revenue leakage from the Palestinian Authority to Israel. The report findings suggest that ending the Israeli occupation is a prerequisite for sustainable economic development in Palestine.

	Sector	Estimated Cost of Occupation (\$ million)
1	Natural Resources	2,627.20
1.1	Access to water resources	1,448.92
1.2	Gas marine reserve	160.00
1.3	Land confiscation	999.89
1.4	Access to fishing zone	18.36
2	Infrastructure	3,343.20
2.1	Israeli assault on Gaza Strip 2014	2,759.00
2.2	House demolitions	10.27
2.3	Electricity	388.92
2.4	Restriction on domestic movement of goods and people	185.00
3	Industries and Services	1,554.70
3.1	Mining & Quarrying	1,158.7
3.2	Banking	15.00
3.3	Agriculture	23.00
3.4	Tourism	56.11
3.5	Telecommunications	48.00
3.6	Export & import restrictions	253.89
4	Human Capital	1,614.00
4.1	Support for Palestinian prisoners	200.00
4.2	Deductions from Palestinian workers in Israel	1,414.00
5	Fiscal cost and fiscal revenue leakage	319.70
	Total	9,458.8

Appendix 1: Dual-use item list

ISRAELI LISTS OF FORBIDDEN & RESTRICTED GOODS TO THE WEST BANK & THE GAZA STRIP

I. ARMS & MUNITIONS:

Forbidden transfer under all circumstances across Israel's frontiers without specific permits - as defined in the Control of Exports Security Order (Arms and Munitions) 2008, and in the Control of Exports Security Order (Missile Equipment) 2008.

II. LIST OF RESTRICTED DUAL-USE GOODS TO THE WB:

The list of restricted dual-use goods below is excerpted from the Defense Export Control (Controlled Dual-Use Equipment Transferred to Areas under the Palestinian Authority Jurisdiction) Order 2008 last updated on 2 August, 2009 and translated from Hebrew.

A. Chemicals

1. Chlorate Salts
 - a. Potassium chlorate – KClO_3
 - b. Sodium chlorate – NaClO_3
2. Perchlorate Salts
 - a. Potassium perchlorate – KClO_4
 - b. Sodium perchlorate – NaClO_4
3. Hydrogen peroxide – H_2O_2
4. Nitric acid – HNO_3
5. Musk xylene – $\text{C}_{12}\text{H}_{15}\text{N}_3\text{O}_6$
6. Mercury – Hg
7. Hexamine – $\text{C}_6\text{H}_{12}\text{N}_4$
8. Potassium permanganate
9. Sulfuric acid – H_2SO_4
10. Potassium cyanide – KCN
11. Sodium cyanide – NaCN
12. Sulfur – S
13. Phosphorus – P
14. Aluminum powder – Al
15. Magnesium powder – Mg
16. Naphthalene – C_{10}H_8
17. Fertilizers
 - a. Ammonium nitrate – NH_4NO_3
 - b. Potassium nitrate – KNO_3
 - c. Urea – $\text{CH}_4\text{N}_2\text{O}$
 - d. Urea nitrate – $\text{CH}_4\text{N}_2\text{ONO}_3$
 - e. Fertilizer 27-10-17
 - f. Fertilizer 20-20-20
 - g. Any fertilizer containing any of the chemicals in items a – c
18. Nitrous Salts of other metals:
 - a. Sodium nitrate – NaNO_3
 - b. Calcium nitrate – $\text{Ca}(\text{NO}_3)_2$

19. Pesticides
 - a. Lannate
 - b. Endosulfan
20. Nitrite Salt
21. Methyl bromide – CH₃Br
22. Potassium chloride – KCL
23. Formalin – CH₂O
24. Ethylene glycol – C₂H₆O₂
25. Glycerin – C₃H₈O₃

B. Other Materials and Equipment

26. Platen, titanium, or graphite plates not more than 10 cm thick
27. Communication equipment, communication support equipment, or any equipment that has a communication function
28. Equipment whose operation can cause interference in communication networks
29. Communication network infrastructure equipment
30. Lathe machines for removing metals (including center lathe machines)
31. Lathe machine spare parts, lathe machine equipment, and lathe machines accessories
32. Machine tools that can be used for one or more of the following functions: erosion, screwing, purifying, and rolling
33. Casting ovens of more than 600 degrees Celsius
34. Aluminum rods with a radius between 50 to 150 mm
35. Metal pipes of 50 to 200 mm radius
36. Metal balls with a radius of 6 mm and bearings containing metal balls with a 6 mm radius
37. Optical binoculars
38. Telescopes including aimers (and markers)
39. Laser distance measuring equipment
40. Laser pointers
41. Night vision equipment
42. Underwater cameras and sealed lenses
43. Compasses and designated navigation equipment including GPS
44. Diving equipment, including diving compressors and underwater compasses
45. Jet skis
46. External marine engines of more than 25 Hp and designated parts for such engines
47. Parachutes, surf-gilders, and flying models
48. Balloons, dirigible airships, hanging gliders, flying models, and other aircraft that do not operate with engine power
49. Devices and instruments for measuring gamma and x-rays
50. Devices and instruments for physical and chemical analysis
51. Telemetric measuring equipment
52. All-terrain vehicles
53. Firearms and ammunition for civilian use (e.g., for hunting, diving, fishing, and sports)
54. Daggers, swords, and folding knives of more than 10 cm
55. An object or a system of objects that can emit fire or detonators including fireworks
56. Uniforms, symbols and badges.
57. All items listed in the Defense Export Control Order (Controlled Dual-use Equipment), 2008 - Items listed under the Wassenaar Arrangement: As specified in the updated (2008) "Wassenaar Arrangement on Export Controls for Arms and Dual Use Goods and Technologies - List of Dual Use Goods and Technologies and Munitions List."

III. LIST OF RESTRICTED GOODS TO THE GAZA STRIP

According to the decision taken on June 20, 2010, by the Israeli Security Cabinet, the Government of Israel formed two categories of listed items whose entry into Gaza would be subject to Israeli control.

The lists as published by COGAT:³³

A. Items listed in Lists I & II above in addition to:

1. Fertilizers or any mixture containing chloric potassium with concentrations greater than 5%.
2. Fibers or textiles containing carbon (carbon fibers or graphite fibers), including:
 - a. Chopped carbon fibers.
 - b. Carbon roving.
 - c. Carbon strand.
 - d. Carbon fabric tape.
3. Glass fiber-based raw materials, including:
 - a. Chopped glass fibers.
 - b. Glass roving
 - c. Glass strand.
 - d. Glass fabric tape.
 - e. S-glass.
 - f. E-glass.
4. Vessels.
5. Fibers or fabrics featuring polyethylene, also known as Dyneema.
6. Retro detection devices.
7. Gas tanks.
8. Drilling equipment.
9. Equipment for the production of water from drillings.
10. Vinyl ester resins.
11. Epoxy resins.
12. Hardeners for epoxy resins featuring chemical groups of durable or reliable types, including:
 - a. DETA – diethylenetriamine.
 - b. TETA – thiethylenetriamine.
 - c. AEP – aminoethylpiperazine.
 - d. E-100-ethyleneamine.
 - e. Jeffamine T-403.
 - f. Catalyst 4,5,6,22,23,105, 140, 145,150,179,190,240.
 - g. D.E.H 20,24,25,26,29,52,58,80,81,82,83,84,85,87.
 - h. XZ 92740.00
13. Vinyl ester accelerants, including:
 - a. DMA-dimethylaniline.
 - b. Cobalt octoate.
 - c. MEKP – methylethyl keyone peroxide.
 - d. AAP – acetyl acetone peroxide.

³³

<http://www.mfa.gov.il/NR/rdonlyres/F1E4CCD4-AC96-4BA9-803A-816E51300594/0/COGATCivilianPolicyGazaStrip.pdf>

- e. CuHP – cumene hydroperoxide.
- 14. M or H type HTPB, hydroxyl-terminated polybutadiene.
- 15. Water disinfection materials– solutions with a concentration of over 11%.

B. Construction Items and Materials to be allowed Entry into Gaza only for PA-authorized Projects Implemented by the International Community:

- 1. Portland cement, quicklime (bulk or bags or drums).
- 2. Natural aggregates, quarry aggregates and all foundation materials.
- 3. Prepared concrete.
- 4. Concrete elements and/or precast and/or tensed concrete.
- 5. Steel elements and/construction products.
- 6. Concrete for foundations and pillars of any diameter (including welded steel mesh).
- 7. Steel cables of any thickness.
- 8. Forms for construction elements of plastic or galvanized steel.
- 9. Industrial forms for concrete pouring.
- 10. Beams from composite materials or plastic with a panel thickness of 4mm and thicker.
- 11. Thermal insulation materials and/or products.
- 12. Concrete blocks, silicate, Ytong or equivalent, plaster (of any thickness).
- 13. Building sealing materials or products.
- 14. Asphalt and its components (bitumen, emulsion) in bulk or in packages of any sort.
- 15. Steel elements and/or steel working products for construction.
- 16. Elements and/or products for channeling and drainage from precast concrete with diameters of over 1mm.
- 17. Trailers and/or shipping containers.
- 18. Natural wood beams and platforms over 2cm thick except for those in finished products.
- 19. Vehicles except for personal vehicles (not including 4X4 vehicles), including construction vehicles.

Notes:

- 1. Any item not contained in the list of controlled items will be allowed to enter the Gaza Strip.
- 2. The list of controlled items will be updated from time to time.
- 3. Requests for authorization to transfer items included in this list to the Gaza Strip may be referred to the Gaza CLA.

References

- Abu Ju'ub, G. (2003). Water conflicts in the Middle East between the present and the future, mimeo.
- Addameer statistics (2015). <http://www.addameer.org>.
- Alatawneh, Haroon M. *Role of Agriculture in Economic Growth in Palestine*. Doctoral Dissertation. Aristotle University of Thessaloniki, 2013.
- Anthony, C. Ross, Daniel Egel, Charles P. Ries, Craig Bond, Andrew Liepman, Jeffrey Martini, Steven Simon, Shira Efron, Bradley D. Stein, Lynsay Ayer and Mary E. Vaiana. *The Costs of the Israeli-Palestinian Conflict*. Santa Monica, CA: RAND Corporation, 2015. http://www.rand.org/pubs/research_reports/RR740-1.html.
- Bank of Israel (2010). Recent economic developments, Tel Aviv, May–August: 128.
- B'tselem (2006). *Act of vengeance*, Jerusalem.
- Cook, Jonathan. “The Nakba continues: Israel continues its theft of Palestinian natural resources”. *The Washington Report on Middle East Affairs*, January/February 2014. <http://www.wrmea.org/2014-january-february/the-nakba-continues-israel-continues-its-theft-of-palestinian-natural-resources.html>
- Djankov, S., Freund, C. and Pham, C.S. (2010), Trading on time, *Review of Economics and Statistics*, Vol. 92, No. 1: 166–173
- Gal, I., A. Ashkenazi, S. Bamyá, and S. Makhtoob. (2010). “The Economic Development of the Jordan Valley” in Arie Arnon and Saeb Bamyá (editors) *Economic Dimensions of a Two-State Agreement Between Israel and Palestine, Volume II Supplementary Papers*, Aix Group.
- Gaza Electricity Distribution Company GEDCO (2010), Online Statistics and Reports, Technical Statistics, available at <http://www.gedco.ps/e/under.php>
- Glover, S. and Hunter, A. (2010). Meeting future Palestinian water demand needs, MAS.
- GOI (2008). National Blueprint (NBP) 14b - NBP of Mining and Quarrying Sites for the Construction and Road Building Business, Israeli Ministry of Interior.
- GTZ (1996) *Middle East Regional Study on Water Supply and Demand Development* (GTZ).
- Haddad, M. (2009). Palestinian Water Rights: Past, Present and Future, in *Water: Rights and Values* (Palestine Academy Press, Ramallah).
- IMF (2011). Macroeconomic and fiscal framework for the West Bank and Gaza: Seventh review of progress, Staff report for the meeting of the ad hoc liaison committee, Brussels.
- ILO (2014). The situation of workers of the occupied Arab territories. International labor conference, 103rd session.

- Isaac, J. and N. Hrimat (2007). A Review of the Palestinian Agricultural Sector, Applied Research Institute of Jerusalem.
- Jayyousi, A. & Srouji, F. (2009). *Future Water Needs in Palestine* (MAS, Ramallah).
- Jordanian Ministry of Tourism (2014). Beds Night / Arrivals at Classified Hotels by Location & Country Groups, 2014.
- Khammash, T. and Alkhas, Z. (2009). Tourism Sector Report, ABC Investments, Amman, Jordan.
- Lev-Ram, M. (2009). Turning Dead Sea mud into money, CNN Money, available at http://money.cnn.com/2009/12/09/smallbusiness/ahava_dead_sea.fsb/index.htm
- McHugh, R. (2009). Seawater Desalination in Palestine: Feasibility and Options, in *Water: Rights and Values* (Palestine Academy Press, Ramallah).
- Nasser ,Y. (2003) “Palestinian Water Needs and Rights in the Context of Past and Future Development”, in *Water: Rights and Values* (Palestine Academy Press, Ramallah).
- Palestine Investment Fund (2011). Annual Report, 2010, Ramallah, Palestine.
- Palestinian Ministry of National Economy (2010), Minutes of meeting of the Private sector development and trade sector working group, Ramallah, September.
- PALTRADE (2010), West Bank Crossing Bi-monthly Monitoring Report, June-July 2010. Available at <http://siteresources.worldbank.org/INTWESTBANKGAZA/Resources/June-Jul2010.pdf>
- PCBS (2009a), Water Statistics in the Palestinian Territory Annual Report, 2008, Ramallah, Palestine.
- PCBS (2009b), Agricultural Statistics 2007/08, Ramallah, Palestine.
- PCBS (2009c), Price of Water Purchased from Israeli Water Company (Mekorot) in the Palestinian Territory by Region and Type of Use, 2009, Ramallah, Palestine.
- PCBS (2010), National Accounts at Current and Constant Prices (2008, 2009), Ramallah, Palestine.
- Phillips, D, J, H. Attili, S. McCaffrey, S. & Murray, J, S, (2007). The Jordan River Basin: 2. Potential Future Water Allocations to the Coriparians, *Water International* 32(1) pp. 39-62.
- Tignino, M. (2009) Rethinking the Protection of Water Rights for the Palestinian People: the Need for a Comprehensive Approach, in *Water: Rights and Values* (Palestine Academy Press, Ramallah).

- UN OCHA & WFP (2010). Between the Fence and a Hard Place, Special Focus, August 2010.
https://www.ochaopt.org/documents/ocha_opt_special_focus_2010_08_19_english.pdf
- UN OCHA (2011), West Bank Movement and Access Update, Jerusalem.
- UNCTAD (1986). Recent economic developments in the occupied Palestinian territories, UNCTAD/TD/B/1102.
- UNCTAD (2011) Report on UNCTAD assistance to the Palestinian people: Developments in the economy of the occupied Palestinian territory, UNCTAD: Geneva.
- UNDP (2010). One year after Report. Gaza Early Recovery and Reconstruction Needs Assessments, Jerusalem.
- UNDP and ARIJ (2014). Preliminary Assessment: Gaza Crisis – 2014.
- Vengosh, A. et al. (2004). Sources of Salinity and Boron in the Gaza Strip: Natural Contaminant Flow in the Southern Mediterranean Coastal Aquifer, *Water Resources Research* 41.
- WaSH MP (2004) Water for Life: "Israeli Assault on Palestinian Water, Sanitation and Hygiene during the Intifada.
- WaSH MP (2005). Water for Life: Continued Israeli Assault on Palestinian Water, Sanitation and Hygiene during the Intifada.
- World Bank (2007). West Bank and Gaza Energy Sector Review, Washington DC: The World Bank.
- World Bank (2009). *Assessment of Restrictions on Palestinian Water Sector Development*, Sector Note.
- World Bank (2010b). *The Underpinnings of the Future Palestinian State: Sustainable Growth and Institutions*, Economic Monitoring Report to the Ad Hoc Liaison Committee.
- World Bank (2011). *Building the Palestinian State: Sustaining Growth, Institutions, and Service Delivery*, Economic Monitoring Report to the Ad Hoc Liaison Committee.
- World Bank (2013). *Area C and the Future of the Palestinian Economy*.
- World Bank (2015). *Doing Business Indicators*, Trading Across Borders, online data, available at <http://www.doingbusiness.org/data/exploretopics/trading-across-borders>
- Yesh Din (2009), Petition for an Order Nisi and an Interim Injunction, The Supreme Court of Israel, Jerusalem.
- Zohar, Hanna, and Shir Hever. *Israel Owes Billions of Shekels to Palestinian Workers*. Jerusalem: Alternative Information Center, 2010.

The Economic Cost of the Israeli Occupation of the occupied Palestinian Territories



Applied Research Institute -Jerusalem
P.O. Box 860, Karm Mu'amar, Karkafeh St,
Bethlehem, Palestine.
Tel: +970-274-1889
Fax: +970-277-6966
Website: www.arij.org