Compounding Vulnerability: Impacts of Climate Change on Palestinians in Gaza and the West Bank

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Coping with (and adapting to) climatological hazards is commonly understood in intergovernmental and aid agency fora as a purely technical matter. This article examines the UN Development Programme's stakeholder consultations in the West Bank and Gaza Strip in order to challenge the donor-driven technical-managerial framing of Palestinian climate vulnerability by showing how Israeli occupation practices exacerbate environmental stresses. While emphasizing the importance of social, economic, and political contexts in shaping populations' responses to climate change in general, the authors demonstrate the multiple ways in which the occupation specifically compounds hazards reveals it as constitutive of Palestinian climate vulnerability.

At the December 2009 fifteenth conference of the parties (COP15) of the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen, 130 heads of state and government affirmed their commitments to address climate change, including Palestinian Authority (PA) Prime Minister Salam Fayyad and Israeli President Shimon Peres. Observers hoping that shared climate risks would be an area for Palestinian-Israeli cooperation were disappointed. Both leaders acknowledged that significant climate change was forecasted by the end of this century for the Eastern Mediterranean region: its impacts, Fayyad noted, included decreased precipitation, significant warming, more frequent extreme weather events, and a rise in sea level.[1] There was also a shared recognition that the key hazards posed by these changes—greater water scarcity, falling agricultural productivity, an increased probability of flash floods, and saline intrusion into groundwater—will be accentuated by a growing population.

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There the commonality of concerns ended. "Carbon molecules carry no passport," stated Peres,[2] inviting Israel's neighbors—including the PA—into a regional environmental taskforce to tackle climate change. Rejecting this offer, the Palestinian delegation pointed out that the inhabitants of Gaza and West Bank are denied the freedom of movement enjoyed by carbon molecules. Indeed, the Palestinians had been granted only limited access to COP15, as observers, following lobbying by the Arab League. In his statement in Copenhagen, Fayyad highlighted the difficulties of representing a territory under occupation, whose full membership in UNFCCC could come only with sovereign statehood. The frustrations of a Palestinian representative with contested legitimacy[3] and the long-term impacts of climate change may be the last concern of Palestinians suffering the daily effects of occupation. Gaza farmers who grow crops in brackish water only to see them barred from export markets do not have the luxury to consider climate-change projections, and neither do herders in the southern Hebron hills routinely subject to settler violence.

But while climate change is not the most pressing issue for Palestinians in the West Bank and Gaza, the climate risks are significant and will compound the current hazards caused or aggravated by the Israeli occupation. As confirmed by recent United Nations Development Programme (UNDP) consultations on climate adaptation in the occupied Palestinian territory (oPt),[4] the impacts of climate change on the livelihoods of most Palestinians pale in comparison with the effects of the Israeli occupation.[5] The "climate vulnerability" approach used here attempts to reconcile this tension between immediate living conditions and external climate impacts. It thus adds to the understanding of the effects of the occupation and challenges those views—such as the Israeli position in Copenhagen—that separate environmental issues from politics. The expected effects of climate change are likely to compound the negative effects of the occupation, primarily by impairing existing coping mechanisms or forcing the adoption of new ones. As important, the policy discourse on climate change affects not only Palestinian living conditions and livelihoods but also state-building efforts.

CLIMATE CHANGE AND VULNERABILITY

In climate research, vulnerability is the propensity of people or systems to be harmed by hazards or stresses, determined by "their exposures to hazard[s], their sensitivity to the exposures, and their capacities to resist, cope with, exploit, recover from and adapt to the effects."[6] Climate change is claimed to alter exposures to climate-related hazards, that is, extreme weather events that can trigger social shocks. What the

Intergovernmental Panel on Climate Change (IPCC) labels key vulnerabilities to climate change—those meriting policy attention as symptomatic of dangerous anthropogenic interference with the climate—depend on the magnitude, timing, and distribution of climate impacts.[7] Early IPCC formulations favored biophysical framings of climate impacts and ecosystem vulnerability, but it is now recognized by scientists that vulnerability to climate change also includes socioeconomic and political conditions affecting how communities cope with climate impacts.[8] This recognition gives a more integrated understanding of vulnerability, capturing the role of nonclimatic pressures on individuals and groups facing climate hazards.

In this broader perspective, climate vulnerability refers to exposure to climate-related hazards in the context of *social* vulnerability and in relation to both short-term (*coping* with hazards' effects) and long-term (*adapting* to them) response capabilities. Climate vulnerability is less about changes in physical systems than the political-economic contexts in which "climate risk" is constructed and produced.[9] The substantive discussion below reports on climate vulnerability as the perceived risks of Palestinians to water-sensitive living conditions and livelihoods in Gaza and the West Bank, with forecasted climate impacts expected to compound the harmful environmental effects of occupation.

Coping with, or adapting to, climate risks must be seen in a political-economic context. As do neighboring countries, the oPt faces projected significant reductions in water availability as a result of climate change. Yet, due to differing institutional structures and resources, there are major regional differences in adaptive capacity. For example, Egypt has reduced river-flow variability through the construction of the Aswan High Dam; Gulf states exploit oil rents to overcome physical water scarcity though heavy investments in seawater desalination, or can overcome physical water scarcity, which threatens food security, by importing food and the water used in its production ("virtual water").[10] Poorer Middle Eastern states less integrated into the global economy have fewer such policy options available to develop their adaptive capacity in the face of forecasted climate change. For the oPt, that adaptation space is even more restricted.

Climate vulnerability in the occupied Palestinian territory

The discursive construction of climate vulnerability in the oPt has been donor driven, led by the UNDP as part of its worldwide Adaptation Programme assisting poorer countries respond to climate change. Since 2008, the UNDP Programme of Assistance to the Palestinian People (UNDP/PAPP) has funded PA capacity-building for climate adaptation, which in 2010 resulted both in a formal PA action program and in the creation of a Palestinian national committee on climate change.[11] This

was a significant shift in political attention given that climate change was not mentioned in the *Palestinian Reform and Development Plan 2008–10* and, until the creation of the national climate committee, had not been considered as a policy challenge by the Palestinian Water Authority or Ministry of Agriculture. The UNDP-funded climate-change initiative was designed to assist the PA Environmental Quality Authority develop the institutional capacity to assess and manage climate risks. In so doing, UNDP promoted a technical-managerial framing of climate vulnerability, which clashed with the conflict-laden experiences of governmental and nongovernmental organization (NGO) representatives and even UNDP/PAPP staff during the stakeholder consultations on climate-change adaptation.

This technical-managerial notion of climate vulnerability rests, first, on the uncritical adoption of scientific projections from global and regional climate models, which derive climate risks from simulated environmental changes. Such projections carry international scientific authority, even when they acknowledge simplifying assumptions and uncertainties, and feature stark scenarios for the Eastern Mediterranean. The IPCC predicts that warming for Southern Europe and the Mediterranean over the twenty-first century will be greater than global annual mean warming—between 2.2°C and 5.1°C according to a credible emissions scenario. Annual mean precipitation is deemed "very likely" to drop in the Mediterranean, decreasing between 4 and 27 percent, with an increased risk of summer drought.[12] Climate projections to 2100 derived from higher-resolution regional climate models applied to the Eastern Mediterranean generally confirm IPCC predictions, with temperature rises of 3.5°C to 4.8°C and winter precipitation decreasing up to 35 percent. They also identify a tendency toward more frequent extreme weather events, including a greater number of heat waves and heavier spring storms, though there is more uncertainty here than with temperature and precipitation projections.[13] Lastly, sea levels in the Eastern Mediterranean are forecasted by Israeli scientists to rise by 10 centimeters every decade, which is consistent with global estimates of a 0.6–1.6 meter increase by the end of the century.[14] Some scientific research claims to have already identified warming and increasing aridity in Israel and the oPt.[15] However, regional climate-model simulations have failed to reflect significant environmental variations within the oPt, even though these were used to generate the climate-impact forecasts employed in the UNDP consultations on Palestinian climate vulnerability.[16]

Second, the UNDP construction of climate vulnerability in the oPt highlights climate risks as a humanitarian threat, placing them in the policy realms of disaster risk management and emergency response operations. Current high levels of food and water insecurity in Gaza and the West Bank are forecasted to be exacerbated by climate change, because of worsening food-growing conditions (agriculture accounts for more

than two-thirds of oPt water consumption) and a fragile water-supply infrastructure.[17] Combining population-growth forecasts and regional climate-change projections, it has been estimated that the oPt will experience a water deficit of 271 million cubic meters a year by 2020.[18] Given limited PA institutional capacity for disaster risk reduction, representing climate vulnerability as a humanitarian concern sustains the "emergency imaginary" of chronic human insecurity in the oPt, one that reproduces the dependence of the population on international assistance as well as the interventions of external actors.[19] Indeed, donors are increasingly interested in financing climate-change adaptation and mitigation activities in the oPt. UNDP's lead is significant because the agency serves as a main conduit for international (both multilateral and bilateral) aid to Gaza and the West Bank.

Third, UNDP's commitment to PA capacity-building also reinforces the technical-managerial framing of climate vulnerability. Developing Palestinian administrative capacity for climate risk management has become another opportunity to inculcate "good governance" norms into the PA supportive of the Quartet agenda; that is, the existence of a Palestinian Authority coexisting peacefully with Israel while embracing democratic governance and market liberalism.[20] While represented as consistent with UN principles of impartiality and neutrality, the political character of this state-building work was soon evident from the UNDP climate initiative, with Hamas governmental representatives not invited to stakeholder consultations, including meetings in the Gaza Strip. Since the second intifada, international support for Palestinian governance institutions has reflected U.S. and European interests in fostering a compliant PA while undermining "rejectionist" groups, including Hamas and Islamic Jihad.[21] If the incremental reconciliation between Fatah and Hamas has upset this strategy, the PA is still regarded by most of the international community as the recognized territorial authority in the oPt. The attendance of Prime Minister Fayyad at the Copenhagen climate conference and Palestinian participation in subsequent UNFCCC meetings indicate an awareness that exercising regulatory authority on climate-related policy is another signal to external audiences that the PA is ready to assume sovereign powers.

In its climate initiative for the PA, UNDP represented Palestinian climate vulnerability as largely a technical-administrative challenge in the management of ecological risks, notably the increased risk of drought and water scarcity and their effects on agricultural livelihoods and public health. However, a series of UNDP-conducted consultations and workshops between November 2008 and August 2009 soon made this "postconflict" framing untenable. Feedback from government officials, scientists, and NGO representatives identified occupation-related conditions as *constitutive* of Palestinians' vulnerability to climate change. Above all, these conditions relate to the appropriation of

Palestinian water and land resources by Israel; for example, much of the best agricultural land in the Jordan River valley is taken by Israeli settlements, while over a third of arable land in Gaza is effectively not accessible to farmers because it falls within areas declared by the Israel Defense Forces as "no-go" and "high-risk" zones adjoining the border.[22] Similarly, the terms and procedures of the Israeli-Palestinian Interim Agreement on the West Bank and Gaza Strip ("Oslo II")[23] effectively prevent bulk water imports into Gaza and sustainable development of new sources for irrigation or drinking water in the West Bank. The discussion below sets out the trajectories of climate vulnerability mapped out at the UNDP meetings in Gaza and the West Bank, as well as Palestinians' strategies to cope with existing shortfalls in water and food availability.

VULNERABILITY PATHWAYS AND COPING STRATEGIES IN GAZA AND THE WEST BANK

Vulnerability pathways in the Gaza Strip

The 2008–09 UNDP consultations in Gaza revealed a strong consensus among participants that its inhabitants as a whole have high climate vulnerability, though some communities are particularly exposed to climate-related hazards, such as residents of Jabaliya and Khan Yunis (due to recent storm water overflows), and those in inland lowlands, including neighborhoods of Gaza City.[24] This view reflects the exposure of the population to multiple biophysical hazards and, despite a wide array of coping mechanisms, its low capacity to adapt over the long term to Israeli sanctions and blockade. Palestinians in Gaza identified multiple pathways of climate vulnerability in the UNDP consultations. Highlighted above all is the dominant role of the Israeli blockade in coproducing vulnerability to climate risks: its direct and indirect effects were seen by stakeholders as significantly eroding public-health conditions and rural livelihoods.

Highlighted for Gaza was the dominant role of the Israeli blockade in coproducing vulnerability to climate risks, significantly eroding public-health conditions and rural livelihoods.

The Israeli blockade of Gaza has a significant impact on land and water resources, including restrictions on offshore fishing. Since December 2008 Israel has imposed a sea border on Gaza of three nautical miles, severely affecting fishermen and greatly reducing the fish catch in the Gaza Strip.[25] Food security is further compromised by barriers to food imports, and the blockade has cut off export earnings from produce (e.g., strawberries, oranges, and cut flowers) formerly destined for Israel, Egypt, and Europe.

The effect of the blockade on wastewater treatment is yet another conflict-related source of climate vulnerability. Untreated or partially treated

wastewater (including the "sewage lakes" of the Northern Treatment Plant in Bayt Lahiya and the raw sewage outflows around Khan Yunis and Rafah at least until 2010) seeps into the groundwater, further increasing nitrate and chloride levels, with associated health risks.[26] This vulnerability is accentuated by Israeli military assaults, including Occupation Cast Lead in 2008–09, which seriously damaged or destroyed 203 registered agricultural wells and 4 drilling wells and damaged over 19,000 meters of water pipes. In addition, a direct hit to the embankment wall of the al-Zaytun wastewater treatment plant caused a sewage spillage affecting 55,000 square meters of agricultural land.[27]

The vulnerability of Palestinians in Gaza to the environmental effects of the occupation is compounded by long-term climate-change risks. Projected higher rainfall variability and precipitation decreases threaten rain-fed agriculture and add strain to stressed groundwater resources. Increased temperatures are expected to accentuate this, because of greater groundwater pumping under conditions of increased evapotranspiration and desertification (particularly in the south).

The effects of worsening water quality reach even further. Israelis and Palestinians have overpumped the coastal aquifer for decades. The aquifer's sustainable limit has been estimated at 350 million cubic meters per year (MCM/y), of which the Gazan portion is roughly 55 MCM/y.[28] Total pumping within the Gaza Strip in 2008 was estimated at roughly 100–170 MCM/y.[29] Not accounting for return flows, this means that the Gazan portion of the aquifer is already being overdrawn two to three times its sustainable limit. With the additional water stresses predicted from climate change and rapid population growth, the existing need for alternative water sources (e.g., significant transfers from southern Israel and/or a major desalination plant in Gaza) becomes even more pressing.

Palestinians living in the Gaza Strip already suffer the effects of severe water quality issues, the scale of which is difficult to exaggerate.[30] Due primarily to its permeable and sandy cover, the transboundary coastal aquifer supplying groundwater to the Gaza Strip has a significant intrinsic vulnerability to pollution.[31] Projected climate change–induced reductions in precipitation would exacerbate groundwater salinity levels through reduced soil flushing and groundwater recharge, while reductions in air moisture increase the soil-water requirement of crops. Additional saline contamination of groundwater is expected with projected sea-level rise, compounding "natural" sources of salinization.[32]

Community and household coping mechanisms in Gaza

Gaza residents have developed several mechanisms to cope with climate vulnerability. Some of these mechanisms are impaired by the Israeli occupation, while others are imposed by extreme conditions of life. As with smuggling under the border with Egypt, ingenuity serves both

survival and resistance to the blockade. Whether impaired by occupation or enforced by conditions, these coping mechanisms carry their own risks and may serve to perpetuate climate vulnerability.

An example of impaired coping comes from the wastewater dilemma: whether to send it to the sea or let it percolate into the groundwater. Under more normal conditions, the Palestinian Water Authority (PWA) and the Coastal Municipalities Water Utility (CMWU) would carry out an emergency upgrade to the Bayt Lahiya wastewater treatment plant, temporarily sending sewage into the sea in order to avoid a grave public-health risk. With both options forestalled by the Israeli blockade, resource managers cope by shoring up the bank of the reservoir, protecting residents on its edge but letting sewage contaminate the freshwater aquifer.

The development of private water treatment plants exemplifies an enforced coping mechanism. In Gaza the increasingly poor drinking-water quality has led to increased purchase of desalinated water from neighborhood-level reverse-osmosis vendors or the purchase of under-the-sink desalinization units. Both coping mechanisms contribute to the ever-greater share of household income spent on basic services, at least for those who can afford the option.[33] The sale of water by neighborhood vendors is not regulated and its quality never tested. Contamination is very likely either at the source (because of poor maintenance) or during transportation (contaminants entering the jerry cans and buckets used to transport the water). Even the water produced by the household filtration units remains biologically contaminated for lack of proper maintenance. The PWA and CMWU have responded by mixing water from safe and unsafe sources into the distribution network to increase drinking-water availability at a marginally safer quality level. By notifying residents when it supplies safer water (from a less polluted source) and when it supplies unsafe water (which may still safely be used for washing), the overall coping ability of the community is increased. But the resilience of such enforced coping mechanisms in the long term is, at best, precarious.

While other coping mechanisms are more benign, their contribution to long-term adaptive capacity may not be. Agricultural coping with the water crisis sector is evident in the selection of less water-intensive and more salt-resistant crops, such as date palms. This practice is in fact a return to tradition, as water-intensive citrus production began during Israeli settlement in Gaza. Similarly, the lack of chemical fertilizers has led farmers to rediscover organic methods and to use partially treated wastewater. Shortages of cooking gas have encouraged solar food-drying pilot projects.[34] Yet under worst-case, climate-change scenarios, such benign coping mechanisms may prove insufficient to sustain farming livelihoods. With that threshold breached, a new set of vulnerabilities may have to be faced, such as prospects for alternative livelihoods in an economy prevented from trading with the world.

Vulnerability pathways in the West Bank

As in the case of Gaza, living conditions and livelihoods in the West Bank are affected by the biophysical and political-economic coproduction of climate vulnerability, specifically risks associated with decreased and more variable precipitation and risks associated with the Israeli occupation. Given its large consumption of water and importance as the key source of rural livelihoods, agriculture is again the sector most sensitive to climate variability and change, particularly in Jenin and Tulkarm governorates and the Jordan River valley. This sensitivity is heightened by a reliance on rain-fed agriculture: 94 percent of nonsettlement arable land (166,000 hectares) is rain-fed, with about two-thirds taken up by fruit trees (olives, citrus, and also grapevines) and most of the rest by field crops. While olive and some citrus trees are relatively resilient and can tolerate several drier-than-usual seasons, wheat and fodder yields are very sensitive to rainfall.[35]

Groundwater is by far the main source of water for the West Bank. Each of the three aquifer basins lying under the West Bank is transboundary with Israel. There is high variability in these aquifers' recharge rates and sustainable yields, but the terms of Article 40 of the Oslo II agreement dictate that Palestinians limit their abstraction to 20 percent of the estimated total renewable potential. Debates are fierce over whether the estimated potential reflects actual sustainable yields. Israeli abstractions from 1995 to 2003 regularly exceeded the treaty (80 percent) or physical limit (on average 72 MCM/y over the Oslo II allocated abstraction).[36] Oslo II also prevents any Palestinian drilling from the preferred (in terms of quality, quantity, and costs) aquifer basin and subjects drilling in the other basins to Israeli approval through the Joint Water Committee.[37]

With West Bank groundwater being extracted beyond sustainable limits, projected regional precipitation decline and warming would exacerbate stresses on water quantity and quality. Recent research forecasts significant falls in aquifer-recharge volumes and increased water salinization as a result of climate change, although the forecast has significant uncertainty.[38]

The UNDP stakeholder consultations in the West Bank revealed agreement on reduced rainfall as the most important climate risk to rural livelihoods, identifying several negative effects of reduced precipitation on groundwater supply and agricultural yields. Decreased rainfall is projected to lead to reduced aquifer-recharge rates, lower soil moisture, less water supplied from Israel, reduced spring flow, and increased groundwater salinization. The forecasted lower agricultural yields would negatively affect agricultural livelihoods, both directly through reduced incomes and indirectly through the confiscation of land left unplanted for three years.[39]

More variable West Bank precipitation would also affect agricultural yields and rural livelihoods in multiple ways. First, periods of

heavier rainfall would be concentrated in a shorter time, with consequent increased runoff and erosion from storm water floods. Less water retained in the soil would result in less pasture vegetation, forcing farmers and herders to purchase more fodder. Second, reduced rainfall would result in less water harvested stored in cisterns and a consequent fall in agricultural productivity. Altered growing seasons further put crops at risk, as seeds sown in autumn in anticipation of late November rains risk spoiling if the rains are delayed to January.

Greater seasonal temperature variability and more frequent temperature extremes can endanger temperature-sensitive crops. Drought damage is expected to increase with reduced water availability, hotter temperatures, and shorter winters. Under such conditions, more pests and pathogens will not only cause plant diseases but also increase crops' sensitivity to drought, and loss of biodiversity may reduce the natural control of agricultural pests. A delayed growing season would also cause Palestinian agriculture to lose its advantage over countries in colder climates as an early exporter of flowers, fruits, and vegetables.

Climate-induced stress on West Bank water resources is compounded by the Israeli occupation. The occupation's effects make livelihoods more precarious and increase tensions between communities and between Palestinian ministries and Israeli authorities. The numerous access and movement restrictions arising from the separation barrier, expanding settlements, and Israeli settler/military roads significantly impair agricultural activity. Palestinian farmers are denied regular access to their lands and to markets, directly affecting yields and rural livelihoods. Unchecked settler violence against Palestinian civilians and property, including crops and water infrastructure, is a routine impact of the occupation on rural Palestinian communities.[40] Longer-term adaptation strategies are also compromised by Israeli occupation practices. For example, the restrictions imposed by the separation wall on Palestinian wells have significantly reduced the availability of water for farmers around Qalqilya.[41]

Climate-induced stress on West Bank water resources is compounded by the occupation, which makes livelihoods more precarious through access and movement restrictions and unchecked settler violence, including against Palestinian crops and water infrastructure.

Community and household coping mechanisms in the West Bank

Palestinians in the West Bank have developed a number of mechanisms to cope with the climate vulnerability they experience. At least from the time of Ottoman rule, sedentary farmers and Bedouins in the southern Hebron region have effectively adapted to periods of drought by shifting between livestock breeding and small-scale farming. That the Hebron Governorate still includes both the largest area in the oPt for barley cultivation and the highest concentration of farm animals suggests a continuing adaptive coordination between agricultural subsectors.

Historical adaptation to climatic hazards and other pressures on livelihoods is evident from the region's extensive remains of *khirab* (temporary villages), where land was not cultivated unless environmental and market conditions were favorable. Until recently, it was common for rural families to supplement their incomes by sending members to seasonal employment in nearby cities in the West Bank (e.g., the glass industry in Hebron) or in Israel. However, since the outset of the second intifada in 2000, Israeli work permits have become very difficult to obtain for Palestinians, and income from these later-traditional coping mechanisms has dried up. Many in the Hebron Governorate have (re)turned to breeding goats and sheep to cope economically. Herd sizes have increased significantly in the past ten years, increasing human pressures on climate-stressed rangeland and triggering a vicious cycle of overgrazing and land degradation.[42]

In the northern governorate of Tubas, which is economically dependent on agriculture, repeated droughts have contributed to reduced spring flow, limiting the time farmers have for irrigation and for producing second or third harvests. As in the southern Hebron Governorate, half the population of the Tubas Governorate is not connected to the Palestinian water network, making them dependent on rainwater harvesting, cisterns, and tankers. Israeli movement restrictions block access to agricultural land for several villages in the region (e.g., around Al-Bikay'a). As with other Palestinian villages in Area C, these controls also mean that rural communities typically pay higher prices and suffer poorer water quality than would otherwise be the case.[43]

Short-term coping mechanisms and long-term adaptation strategies alike are impaired in the Jordan River valley. Dry years have caused cuts in freshwater sold by Mekorot (the Israeli water utility) to southern regions of the Jordan River valley, thus limiting the number of harvests. These communities have had their access blocked to the rich farmlands adjoining the river, or the land has been taken by settlements (approximately 27,000 dunams used by 7,000 settlers in 2006, compared with 53,000 dunams used by 47,000 Palestinians).[44] Compared to the effects of the Israeli occupation, however, climate-induced water scarcity is negligible. It has been suggested that deep wells for Israeli settlements tapping the Eastern Aquifer have reduced groundwater levels, seriously affecting Palestinian springs and wells: fewer than 90 of the 184 agricultural wells in the Jordan River valley are currently functioning.[45] There are signs that farmers are attempting to adapt to conditions of greater water scarcity—for example, moving away from banana and citrus crops in the irrigated lands around Jericho—but movement restrictions prevent reliable and cost-effective access to external markets for alternative cash crops (e.g., eggplants, tomatoes, squash, and maize) as well as livestock and dairy products.

Traditional forms of household and community coping in the face of adversity offer models for rural Palestinian adaptation to climate change, but the Israeli occupation undermines the market conditions necessary to

their operation. Inhibiting the free movement of goods and people perpetuates the de-development of Palestinian economic and institutional capacity.[46] To be sure, Palestinian households and communities must cope with problems not directly linked to Israeli policy, such as the PA financial crisis and fluctuations in food and fuel prices, but West Bank Palestinians' lack of effective control of their natural resources is *constitutive of* their climate vulnerability.

CONCLUSION

The prevailing technical-managerial framing of Palestinians' vulnerability to climate change is largely the product of a donor agenda that fuses international concern over dangerous climate change with the "emergency imaginary" of chronic human insecurity in the oPt. The environmental and humanitarian discourses deployed in this representation are both authoritative. Climate modeling of the Eastern Mediterranean leads climatologists to concur that projected warming is highly likely to cause hazardous biophysical impacts across the region, including in Gaza and the West Bank; unequivocal evidence of current food and water scarcity in the oPt provides support for those who speak of a Palestinian humanitarian crisis. It is not surprising that rural livelihoods feature at the convergence of these two discourses, as agriculture accounts for two-thirds of oPt water consumption and is sensitive to significant shifts in temperature and precipitation. Thus, the UNDP climate-adaptation initiative for the PA focused on food- and water-related stresses in its construction of climate vulnerability pathways for Gaza and the West Bank.

The UNDP gauged climate vulnerability by gathering stakeholder input on scientifically derived climate projections, in order to inform and legitimate proposals for PA climate-adaptation policy. Developing climate-governance capacity therefore became part of a state-building process anticipating a postconflict future in which the PA would assume sovereign control of some Palestinian territory in Gaza and the West Bank. This technical-managerial framing was disrupted by Palestinian stakeholders' insistence that the Israeli occupation is constitutive of their vulnerability to climate risk. Israeli appropriation and degradation of environmental resources in the oPt, whether ostensibly for security or explicitly for settlement purposes, is by far the most immediate and enduring threat to Palestinian living conditions and livelihoods. The UNDP climate consultations also highlighted how Israeli military and security practices significantly weaken the capacity of Palestinians to cope with, and adapt to, climate risks.

Contrary to technical-managerial representations, climate-change impacts in the oPt are inherently politicized, and it makes little sense to develop "postconflict" climate-impact assessments or governance institutions for the Palestinians without an end to the occupation. Indeed, some

claim that the existing conflict could be exacerbated by climate change as asymmetries in per capita water consumption between the oPt and Israel are accentuated.[47] Such claims are overblown: by itself, even human-induced water scarcity is not a robust predictor of violent conflict as virtual water and new water sources (e.g., seawater desalination and treated wastewater) can enhance adaptation to water stresses. However, Palestinian calls for legal and equitable distribution of transboundary waters remain central to their aspirations for sovereignty and self-determination. On this issue, it is instructive that, should serious final-status negotiations resume, Israeli negotiators have cited forecasted climate-change impacts as justification for opposing any reallocation to the Palestinians of shared groundwater supplies.[48] Such a stance exposes as disingenuous calls from Israeli authorities for cooperation with Palestinians on climate change.

ENDNOTES

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2. Mr. Shimon Peres, address to UNFCCC COP15, Copenhagen, 17 December 2009, http://unfccc2.metafusion.com/kongresse/cop15_hls/templ/play.php?id_kongresssession=4164 (accessed 12 April 2010).

3. As Fayyad's appointment as prime minister of an "emergency government" was not approved by the Legislative Council, its constitutional legitimacy was questioned and contested by the Hamas government in Gaza and other parties.

4. Our use of the term "occupied Palestinian territory" (oPt) follows the current nomenclature employed by the United Nations, including UN agencies working in Gaza and the West Bank. Unless otherwise specified, the use of the term "Palestinian" here refers to Palestinians living in the oPt.

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