Environmental sustainability damascus

Environmental sustainability damascus

The Syrian conflict has had devastating human and economic consequences, but it also greatly damaged the environment in the country. This paper provides a preliminary survey of a set of environmental challenges that impose significant health, social and economic costs, including air pollution, deforestation, soil and vegetation degradation, and water depletion, and suggests green solutions for post-conflict relief and reconstruction.

Notably, environmental damage is not just an effect but also a driver of the conflict. Poor environmental conditions in Syria before the war have been identified as a primary factor contributing to the armed conflict, namely the mismanagement of natural resources and waste, the inadequate government response to mining pollution, and the severity of the drought that occurred from 2006 to 2010, which damaged the agriculture sector (comprising 25% of GDP), increased unemployment, amplified food insecurity and triggered mass migration towards urban centres. Combined with a high population growth rate, water scarcity imposed a greater risk of political instability.

Syria suffered high levels of air pollution even before the conflict erupted. In 2010, 69% of the population were exposed to high levels of particulate matter (PM2.5). This high level of air pollution was caused by industrial and vehicle emissions, waste burning, and seasonal pollution - with hazardous particles contributing to chronic disease, breathing problems, and hospitalization. Initially, the eruption of conflict lowered the percentage of the population exposed to particulate matter (by 7% in 2011), as people fled cities in large numbers and industrial activity and energy consumption decreased. Yet, starting 2012, the trend reversed and peaked to 72% in 2015.

Although causation is very difficult to ascertain - especially given the absence of fine-grained, geographically specific data on air pollution inside Syria - the drastic increase in 2015 could be the result of a combination of factors: aerial bombardments carried out by the Syrian and Russian governments against rebel groups; the US-led bombardments of Islamic State-held oil facilities; bushfires and major dust storms that resulted both from military operations as well as the decline in farming activity; and chemical attacks used by the Assad government in March, April, and May 2015. The WHO ranked Syria as the 18th worst air polluter (out of 92 countries) in 2019, with PM2.5 concentration three times above the WHO recommended exposure level.

The level of particulate matter has direct public health effects: estimates of deaths from diseases caused by outdoor air pollution increased by 17% between 2010 and 2017 to a total of 7,684 persons; disabilities related to particulate matter account for 1,625 per 100,000 persons in Syria. These high death and disability rates also affect healthcare costs: the economic burden of disease and premature death related to air pollution in Syria is estimated between 0.6-1.42% of the GDP; environmental/occupational risks driving death and disability increased by 16.5% between 2007 and 2017. High levels of PM also affect agriculture productivity and reduce crop yield, with wheat and oilseed most affected (Chuwahet et al. 2015).

The eruption of war decreased CO2 emissions as a result of the destruction in the energy sector (the dominant source of emissions), the deterioration of agricultural activities, industrialization, and disruption of oil and gas production due to damaged pipelines and other infrastructures in the state-owned main refineries in Banias and Homs. See Figure 2 for a breakdown of emissions by sector.

Figure 2: Syria gas emissions by sector from 2005-2016

Source: CO? emissions by sector, Syria (ourworldindata)

Even though CO2 emissions have decreased, they are still above recommended levels. Syria"s annual emission of CO2 in 2019 was 26.96 million tons, imposing $1.4 trillion in social costs (the current social cost of carbon is estimated at $50 per one ton of carbon dioxide in the atmosphere), increasing the likelihood of extreme weather events such droughts, and leading to the disruptions in food supply chains - similar to pre-war dynamics.

Moreover, other environmental damage has accompanied the decline in CO2 emissions. As a consequence of the bombing of Homs oil refineries and the development of new makeshift refineries by ISIS, hazardous substances have formed. Oil spills from the damaged refineries, wells, trucks, pipelines, and tanks from ISIS operations polluted ground and surface water, as well as soil, leading to polluted drinking water and agricultural land. The pollution and fallout from oil fires have destroyed large areas of cultivated and grazing land and killed livestock, affecting livestock breeders and farmers.

From 2012 to 2019, Syria lost 20.4% of all tree cover (Pax, 2020), much of the loss occurring in the governorates of Lattakia and Idlib, which lost 10% and 27% of tree cover area respectively between 2011 and 2014 (or 89% of the total tree cover loss in Syria). Depletion of forest cover has been linked to a variety of different socio-economic factors related to the conflict, including frequent forest fires, illegal logging, agricultural expansion, charcoal production, and the weakness of state institutions in managing natural resources and environmental development.

Forest fires are a major culprit of deforestation, and their frequency and intensity have increased dramatically during the conflict in Syria. In 2020 alone, fires wiped out over 9,000 hectares of agricultural and forested land, affecting 140,000 people through the destruction and damage to their homes and assets, the loss of power and water supply and limited access to services such as hospitals. One of the main causes of these fires has been the bombing campaigns by different parties to the conflict holed up in dense forests as protection from detection by drones and aircraft.

Environmental sustainability damascus