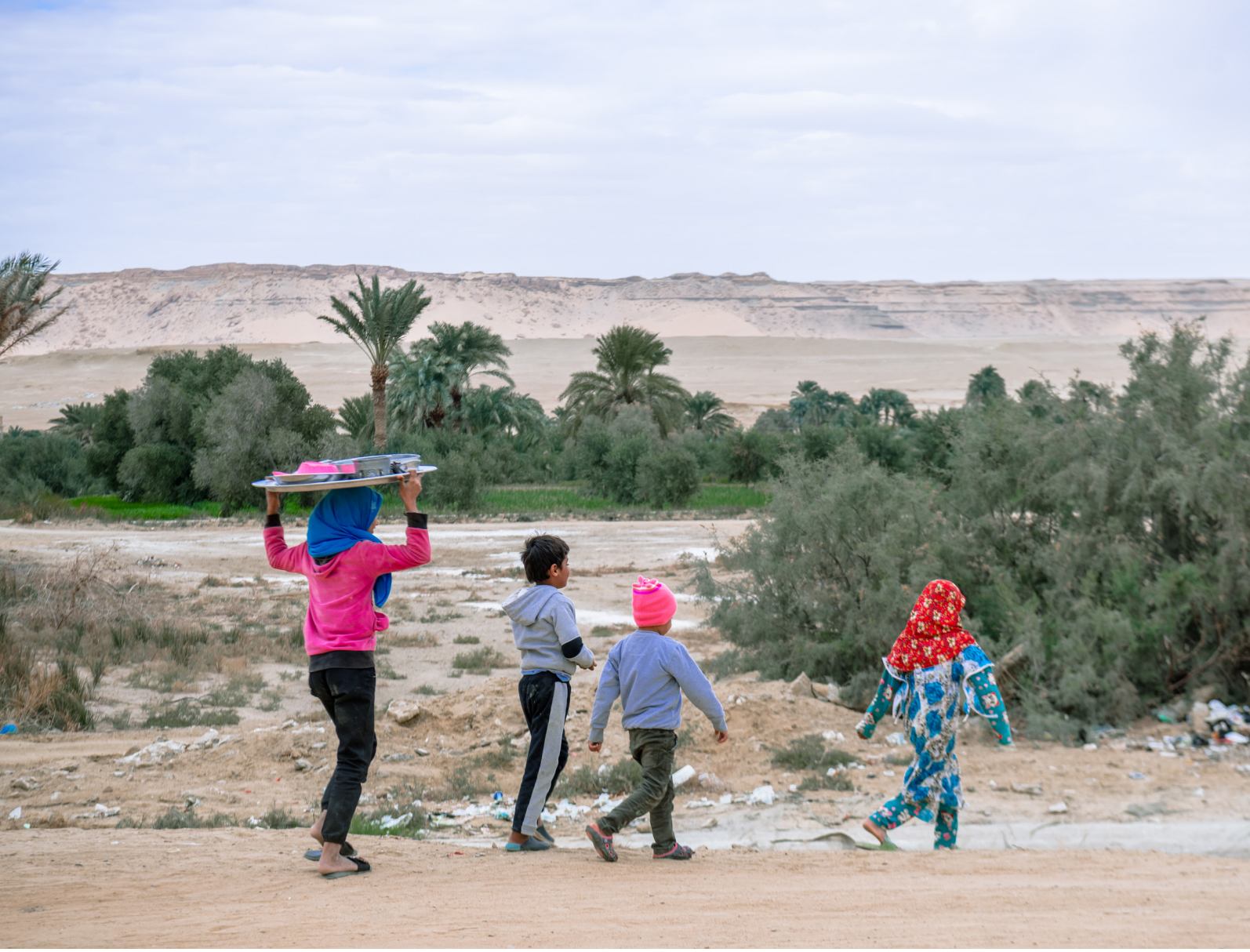


SEMINAR BRIEF | THE ROAD TO COP 27: SHIFTING BEHAVIORS TO ADDRESS CLIMATE CHANGE IN EGYPT

Prepared for: Global Evidence for Egypt Spotlight Seminar Series: A collaboration between UNICEF and The Abdul Latif Jameel Poverty Action Lab Middle East and North Africa (J-PAL MENA) at The American University in Cairo (AUC)

September 29, 2022 | Cairo, Egypt

J-PAL
ABDUL LATIF JAMEEL POVERTY ACTION LAB
MIDDLE EAST AND NORTH AFRICA

The American University in Cairo
School of Business

unicef

Supported by
Allianz

ABOUT THE GLOBAL EVIDENCE FOR EGYPT SPOTLIGHT SEMINAR SERIES

UNICEF and The Abdul Latif Jameel Poverty Action Lab Middle East and North Africa (J-PAL MENA) at The American University in Cairo have partnered to launch a Global Evidence for Egypt Spotlight Seminar Series in Cairo, Egypt. As part of this partnership, UNICEF and J-PAL MENA at AUC bring together Egyptian policymakers and J-PAL affiliated professors in a discussion on priority policy issues in Egypt. During each seminar, policymakers highlight a particular development priority in Egypt. J-PAL affiliates frame the policy issue from a global perspective and offer evidence-informed insights for improving policy and program design from the database of Randomized Control Trials (RCTs) conducted by J-PAL globally. In dialogue, the panel of policymakers and J-PAL affiliate ground the evidence in the Egyptian context and together explore possible policy solutions.

The seventh Global Evidence for Egypt Spotlight seminar will take place on Thursday September 29, 2022, and will focus on how evidence from randomized evaluations conducted globally can inform efforts to adapt and mitigate climate change impacts in Egypt. It will feature Kyle Emerick, J-PAL Affiliate and Associate Professor of Economics at Tufts University as well as representatives from the Ministry of Environment, Allianz, and UNICEF. The panel discussion will foster a conversation between Egypt's climate priorities and the relevant rigorous global evidence, ultimately providing insights into how we can incorporate evidence-based solutions in combating climate change to ensure that climate financing and resources are effectively allocated in the Egyptian context.

ABOUT THE ABDUL LATIF JAMEEL POVERTY ACTION LAB MIDDLE EAST AND NORTH AFRICA AT THE AMERICAN UNIVERSITY IN CAIRO (J-PAL MENA AT AUC)

The Abdul Latif Jameel Poverty Action Lab (J-PAL) is a global research center working to reduce poverty by ensuring that policy is informed by scientific evidence. Anchored by a network of more than 260 affiliated professors at universities around the world, J-PAL conducts randomized impact evaluations to answer critical questions in the fight against poverty. We build partnerships with governments, NGOs, donors, and others to share this knowledge, scale up effective programs, and advance evidence-informed decision-making. J-PAL was launched at the Massachusetts Institute of Technology in 2003 and has regional centers in Africa, Europe, Latin America and the Caribbean, North America, South Asia, and Southeast Asia.

J-PAL MENA at AUC is J-PAL's seventh regional office and leads J-PAL's work in the MENA region. J-PAL MENA conducts randomized evaluations, builds partnerships for evidence-informed policymaking, and helps partners scale up effective programs.

Our research team evaluates the impact of social programs and policies in MENA, covering a wide range of sectors including social protection, employment, education, and gender. Through online and in-person courses, we train implementers, policymakers, donors, and advocates on how to generate and use rigorous evidence. Our policy team works to institutionalize learning from evidence and disseminate research results to governments and other partners.

ABOUT UNICEF IN EGYPT

UNICEF in Egypt is focused on promoting sustainable development with multidimensional equity for children, embodying the fair chance for every child. UNICEF's programme in Egypt contributes to strengthening the knowledge base for more child-sensitive social protection, and improving three fundamental elements of the early childhood years (health, nutrition and development). UNICEF's work on learning and protection covers children of all ages, focusing on the most vulnerable children, children with disabilities and adolescent girls.

UNICEF's work in Egypt contributes to national efforts and priorities and the 2030 National Sustainable Development Strategy, as well as to the United Nations Partnership for Development Framework.

Supported by

Allianz

THE CONTEXT: CLIMATE CHANGE IN EGYPT

The effects of climate change and environmental degradation are fast becoming more severe, and their consequences are more visible around the world. The awareness of the urgency of a decisive response at all levels is also rising, making climate change and environmental degradation an increasingly prominent issue in public policy. While the negative effects of climate change impact all people, children, especially those living in poorer communities, are more vulnerable to the risks of climate change than adults and have less capacity to respond. Egypt is vulnerable to climate change impacts, with a projected increase in heat waves, dust storms, rising sea levels and storms along the Mediterranean coast and extreme weather events[1]. Stronger warming has been documented over the past 30 years, with average annual temperatures increasing by 0.53 degrees Celsius per decade[2].

As the MENA region endures increasing temperatures, Egypt has passed the internationally defined threshold for water scarcity and is nearing 'absolute water scarcity'. Desertification (i.e. land degradation in water-scarce parts of the world) reportedly impacts 3.5 feddans (approximately 3.6 acres) an hour in Egypt[3]. Given that less than 3 percent of the land in Egypt is arable, the high rate of desertification may increase the dangers of drought and decrease the productivity of agricultural land. This in turn threatens the livelihood of vulnerable communities in Egypt as well as food security more generally. As such, addressing Egypt's high vulnerability to climate change and mitigating its adverse impacts are essential to achieving the country's sustainable development.

Greenhouse Gas Emissions

Greenhouse gas (GHG) emissions drive the climate-related challenges that Egyptians living in poverty face. When comparing the emissions of 193 countries, Egypt ranked 28th worldwide, contributing to 0.67 percent of annual carbon dioxide emissions, or 329.4 mn tons, in 2018[4]. The country still relies on fossil fuels for 91 percent of electricity production[5]. Electricity produced from natural gas alone is estimated to account for 70-75 percent of the energy mix[6]. While there is a national target to rely on new and renewable energies by 42 percent by 2035, renewable sources only accounted for 5.56 percent of Egypt's energy mix in 2020[7]. Despite ongoing efforts by the government, greater commitment for emission reduction is needed to fulfill the objectives of the 2015 Paris Agreement on Climate Change.

Egypt is a signatory of the 2015 Paris Agreement on Climate Change, which sets legally binding guidelines to support efforts combating climate change in an attempt to limit the increase in global average temperature, with a target of 1.5°C. Under the framework of the agreement, Egypt is to reduce greenhouse gas emissions (mitigation) and to strengthen the state's capacities to address the adverse consequences of climate change (adaptation). In pursuit of the main arms of the Paris Agreement, mitigation and adaptation, major reforms are to be introduced to the two main contributors to emissions in the country: the energy and agriculture sectors.

The Energy Sector

The main contributor to Egypt's GHG emissions is the energy sector, accounting for 74 percent of 2019 emissions in Egypt and producing over 261 Mt CO2.[8] Electricity and heat production contributed the most (~45 percent) of all activities within the energy sector. Transportation (25 percent), manufacturing and construction (20 percent), other fuel combustion and fugitive emissions (10 percent), were responsible for the remainder. In light of this, to reduce emissions, Egypt is to move away from fossil fuel reliance (oil, coal, and natural gas) and expand the use of renewables (like water, wind, or solar power). Since renewables are a source of energy that do not deplete by use; therefore, their integration in the energy mix not only decreases GHG emissions, but also increases the state's likelihood of reaching energy security.

The Egyptian government's recent energy pricing reform is a step towards incorporating renewable energy in the system. The advantages of investing in renewable energy are well known, however, investing in renewables requires high costs up front. Hence, while Egypt has taken its first steps toward investing in large-scale renewable energy projects, these investments remain relatively smaller in scale compared to those into fossil fuel-based energy sources. Accordingly, by removing energy subsidies, the government now frees finances to invest in renewables. The speed of transition to green energy has been undermined due to recent volatility in the oil market and the

[1] The Climate Crisis is a Child Rights Crisis: Introducing the Children's Climate Risk Index. New York: United Nations Children's Fund (UNICEF), 2021.

[2] GERICS (2019). Climate Fact Sheet – Egypt. URL: https://www.climate-service-center.de/products_and_publications/fact_sheets/ climate_fact_sheets/index.php.en

[3] Mounir, E., 2021. Egypt's desertification is ruining fields, cutting crops and displacing farmers. [online] openDemocracy. <https://www.opendemocracy.net/en/north-africa-west-asia/egypts-desertification-is-ruining-fields-cutting-crops-and-displacing-farmers/>.

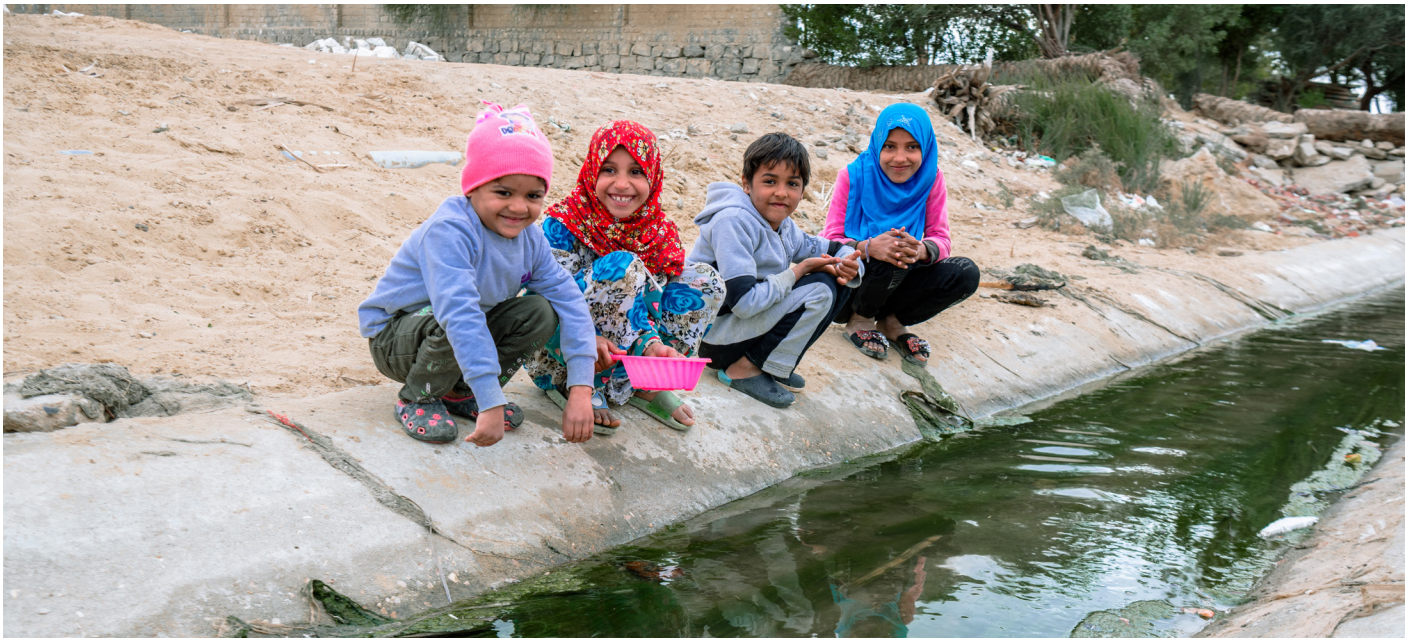
[4] Clark, D., Joiner, S. and Bernard, S., 2021. How each country's emissions and climate pledges compare: A searchable dashboard of 193 countries' historical emissions and future climate targets. [online] Financial Times. Available at: <https://www.ft.com/content/9dfb0201-ef77-4c05-93cd-1e277c7017cf>.

[5] Ibid.

[6] Fitch Solutions. 2020. Egypt Power Report. [online] Available at: <https://store.fitchsolutions.com/all-products/egypt-power-report> [Accessed 24 July 2022].

[7] Ritchie, H., Roser, M. and Rosado, P., 2022. Egypt: Energy Country Profile. [online] Our World in Data. Available at: <https://ourworldindata.org/energy/country/egypt>.

[8] Climatewatchdata.org. 2022. Data Explorer | Climate Watch. [online] Available at: <https://www.climatewatchdata.org/data-explorer/historical-emissions?historical-emissions-data-sources=cait&historical-emissions-gases=All%20Selected%2Call-ghg&historical-emissions-regions=All%20Selected%2CEGY&historical-emissions-sectors=total-including-lucf%2Cenergy&page=1&sort_col=sector&sort_dir=DESC>.



COVER PHOTO: Ahmed Emad © UNICEF/UN0639394/Emad

Covid-19 epidemic; nonetheless, these reforms helped to rectify distorted energy prices and curb domestic overconsumption.

The Agriculture Sector

The second highest contributor to GHG emissions in Egypt is the agriculture sector, accounting for approximately 10 percent of the country's total emissions. The total amount of GHG emissions only increased by a slight 2 percent from 1990-2016, as the sector's contribution to GDP decreased over time. In 2016, agriculture made up 11.8 percent of Egypt's GDP and today that number stands at 11.3 percent[9]. Emissions from agriculture are a result of agricultural activities such as land use, livestock production, on-farm energy use, fertilizer use, and rice cultivation among others.

Reducing emissions from agriculture poses challenges due to the multitude of farming activities and the critical role of agriculture in the life and livelihoods of low income households in Egypt. In an attempt to address this, the Egyptian government encouraged the adoption of agricultural best practices and technologies. In essence, GHG-efficient food production requires a whole-scale adoption of GHG-efficient food production practices. However, getting farmers to change their behavior and adopt new technologies that risk hurting their yield and profits has proven difficult.

Targeting Egypt's agricultural sector for environmental targets also relates to water conservation goals. The agricultural sector is a prime consumer of Egypt's increasingly limited water resources; with agricultural activity consuming from 80 to 85% of water resources (an average of 49.5 cubic kilometers of Nile water)[10]. Furthermore, the challenge of water scarcity has been exacerbated by the building of the Grand Ethiopian Renaissance Dam (GERD). Egypt has been suffering from an annual water deficit of 30 billion cubic meters since 2012, and the completion of the GERD is predicted to see Egypt's water supply reduced by 60 billion cubic meters over a 10-year period. This could result in economic losses of over $2 billion annually [11]. Accordingly, national efforts to combat the harms of climate change have multiplied in recent years.

National efforts to reduce fertility rates in Egypt

To develop a framework around tackling climate change, the Egyptian government launched the National Climate Change Strategy (NCCS) 2050 in November 2021[12]. The national strategy embodies five main goals and 22 objectives aimed at improving climate finance and infrastructure, developing research in green technology, and raising awareness to confront climate change. NCCS 2050 also incorporates activities and targets for green recovery into national planning and budget preparation. As such, the strategy includes a package of projects that attract funding in the areas of adaptation and mitigation.

The launching of NCCS 2050 came a year ahead of Egypt's hosting the 27th Conference of Parties (CoP 27) in Sharm El-Sheikh. In line with NCCS' emphasis on climate finance, the government announced that financial assistance for developing countries must be at the top of CoP 27's agenda. Specifically, the goal for CoP is to operationalize previous pledges to implementation. Additionally, to help direct finances after CoP 27, the government has announced the Green Finance Working Group, who will choose specific projects to develop the country's

[9] Usaid.gov. 2022. Agriculture and Food Security | Egypt | U.S. Agency for International Development. [online] Available at: <https://www.usaid.gov/egypt/agriculture-and-food-security>.

[10] Nikiel, C.A., Eltahir, E.A.B. 2021. Past and future trends of Egypt's water consumption and its sources. Nat Commun 12, 4508.

[11] Sami, A., 2021. Agriculture in Egypt: Modern irrigation to the rescue. [online] Ahram Online. Available at: <https://english.ahram.org.eg/NewsContent/50/1202/412911/AlAhram-Weekly/Economy/Agriculture-in-Egypt-Modern-irrigation-to-the-resc.aspx>.

[12] Arab Republic of Egypt Ministry of Environment. n.d. National Climate Change Strategy 2050. [online]. Available at: <https://www.eeaa.gov.eg/portals/0/eeaaReports/N-CC/EgyptNSCC-2050-Summary-En.pdf>

green infrastructure and diversify the sources that finance these projects to better engage the private sector and in turn make public finance more sustainable.

The Egyptian government is keen on engaging the youth in its efforts to combat climate change. Youth Day is included in the itinerary of CoP 27; in addition, Egypt is hosting the Youth Climate Conference (COY17) on the sidelines of COP27. These events will involve Egypt's "Climate Ambassadors" who are graduates promoting climate change education, specifically the importance of green skills to pave the way for future careers in the green economy. Similarly, among school children, the government is introducing a "Green Minds" initiative aimed at raising climate change awareness and preparing them for climate action.

Overall, the Government of Egypt has taken committed steps towards combating climate change and its impacts on the population. CoP 27 will serve as a significant time for the government to engage with world leaders and ensure commitment to financial pledges and climate ambitions.

THE GLOBAL EVIDENCE: INSIGHTS ON SHIFTING BEHAVIORS TO ADDRESS CLIMATE CHANGE

Given that the main contributors to Egypt's GHG emissions are the energy and agriculture sectors, investing in these two sectors will have great returns for climate change. Focusing on these two sectors gives insight on evidence involving mitigation and adaptation strategies. Mitigation strategies, i.e. ways to reduce the flow of heat-trapping greenhouse gasses into the atmosphere, are generally adopted in the energy sector. Adaptation strategies, i.e. ways to adapt to life in a changing climate, are associated with the agriculture sector.

In regards to energy, evidence from randomized evaluations conducted globally suggests that nudges like social comparisons can reduce energy use by small, but consistent amounts; while programs that encourage investments in residential energy efficiency — such as weatherizing homes — have relatively small impacts and are not a cost-effective means to reduce greenhouse gas emissions. In agriculture, resilience among smallholder farmers can be increased by tailoring financial products and promoting the use of risk-reducing seeds and nutritionally improved crop varieties. Researchers have additionally found that accessible, convenient technologies and information campaigns can increase self-protection against air and water pollution.

i. Providing people with information about their energy or water use compared to their neighbors and tips about how to conserve can consistently reduce consumption by small amounts

Researchers found that in several contexts, people reduced their energy or water use after learning about their consumption compared to their neighbors. Across over 110 utilities and 8.6 million households in the United States [13] [14] [15] [16] [17], one utility in Germany[18], and one site in India[19], providing people with regular home energy reports reduced energy use. Similar reports on water consumption reduced water use in Costa Rica[20] and the US states of California and Georgia[21]. In a study that isolated the effects of social comparisons and conservation tips found that including social comparisons was much more effective than sending conservation tips alone. Furthermore, real-time information about electricity use reduced consumption by 11-14% in Illinois[22]. These results are in line with the broader evidence base on the effectiveness of nudges and light-touch interventions that encourage specific behaviors without limiting an individual's choices[23].

While consistent, the impacts of these energy or water use reports were small. Across more than 110 utilities in the United States, energy use fell by 1–3 percent over seven to 24 months as a result of receiving regular Opower home energy reports. At one utility in Germany, electricity use declined by 0.7 percent over one year[24]. In one site in India, reports reduced electricity use by 7 percent over four months[25]. Water use reports reduced consumption between 3.7–5.6 percent in Costa Rica and the US states of California and Georgia over two–twelve months. While effective, home reports alone will not be enough to substantially reduce carbon emissions or address water scarcity.

In the United States, households continued to conserve even after the reports stopped. Across three US utilities, households that stopped receiving regular Opower reports after two years continued to save 2 percent more energy than the comparison group. The effect of the reports decayed by only 10–20 percent

[13] Allcott, H. Todd, R. 2014. "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation." American Economic Review 104 (10): 3003-3037.

[14] Brandon, A., Paul, F., John, L., Robert,M., Michael, P., and Florian, R. 2017. "Do the Effects of Social Nudges Persist? Theory and Evidence from 38 Natural Field Experiments." NBER Working Paper No. 23277.

[15] Allcott, H. 2011. "Social Norms and Energy Conservation." Journal of Public Economics 95: 1082-1095

[16] Allcott, H. 2015. "Site selection bias in program evaluation." The Quarterly Journal of Economics 130 (3): 1117- 1165.

[17] Ayres, I., Sophie, R., Alice, S. 2013. "Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage." The Journal of Law, Economics, and Organization 29 (5): 992-1022

[18] Andor, A., Andreas, G., Jörg, P., Christoph, S. 2017. "Social Norms and Energy Conservation Beyond the US." Ruhr Economic Papers # 714

[19] Sudarshan, A. 2017. "Nudges in the Marketplace: The Response of Household Electricity Consumption to Information and Monetary Incentives." Journal of Economic Behavior and Organization 134: 320-335.

[20] Datta, Saugato, Juan José Miranda, Laura De Castro Zoratto, Oscar Calvo-González, Matthew Darling, and Karina Lorenzana. "A Behavioral Approach to Water Conservation: Evidence from Costa Rica." World Bank Policy Research Working Paper, June 2015.

[21] Jessoe, K., Gabriel, L., Frank, L., Edward, S. 2017. "Spillovers from Behavioral Interventions: Experimental Evidence from Water and Energy Use." E2e Project Working Paper Series #33

[22] Allcott, Hunt. 2011. "Rethinking Real-time Electricity Pricing". Resource and Energy Economics, 33 (4): 820-842.

[23] Ferraro, J., and Michael, P. 2013. "Using Nonpecuniary Strategies to Influence Behavior: Evidence from a Large-Scale Field Experiment." Review of Economics and Statistics 95 (1): 64-73.

[24] Andor, Mark Andreas, Andreas Gerster, Jörg Peters, and Christoph M. Schmidt. "Social Norms and Energy Conservation Beyond the US." Ruhr Economic Papers #714, October 2017.

[25] Sudarshan, Anant. 2017. "Nudges in the Marketplace: The Response of Household Electricity Consumption to Information and Monetary Incentives." Journal of Economic Behavior and Organization 134: 320-335.

per year after they stopped[26]. The reports worked by changing people's habits and behaviors, such as turning off lights and unplugging electronics, and by encouraging investments in energy efficient technologies.

It may be useful to target home energy reports to people who reduce consumption after receiving them and/or people who want to receive them. Five randomized evaluations found that households with higher relative use reduced consumption more as a result of home energy or water reports[27 28 29 30 31]. High users may be less likely to reduce consumption in response to price increases because they tend to be richer, suggesting that social comparisons can be an effective way to encourage conservation in this group. Home energy reports may also be more effective in places with higher use overall. For example, researchers who tested reports in Germany suggest the smaller effect size they found may reflect the fact that on average German households [32] use less energy than US households. There is also a risk that low energy users may increase consumption after learning they consume less than their peers, as researchers who tested an email intervention similar to home energy reports in Australia found [33].

ii. Programs that encouraged investments in residential energy efficiency had relatively small impacts on energy savings, coupled with low take-up, means that encouraging these investments through information campaigns and subsidies is not a cost-effective strategy to reduce greenhouse gas emissions

A review of five randomized evaluations of programs that encouraged investments in residential energy efficiency (such as home audits to identify inefficiencies and appliance replacements) in the United States and Mexico found that few people took them up. Four evaluations that measured energy savings found lower-than-expected returns in real-world settings. Relatively small impacts on energy savings coupled with low take-up meant that these programs were not a cost-effective strategy to reduce greenhouse gas emissions. Energy savings were smaller than expected in part because projections overestimated the program's potential impact or because people's responses to the programs undermined reductions in energy use, or both.

Engineering models that do not account for human preferences and behaviors are prone to overestimate potential energy savings. In Mexico, installing energy-efficient measures (such as insulation) in new homes did not decrease energy consumption because households often kept their windows open, nullifying the potential impact of insulation[34]. In both Mexico and the United States, projections for subsidized appliance replacement programs did not realistically account for consumer purchase decisions. Consumers bought higher-quality appliance models with greater capacity and more features than their previous units, which - even though they were more efficient - increased energy consumption relative to projections.[35]

Energy efficiency programs that make it cheaper for people to consume energy may lead people to consume more energy, rather than less due to rebound effect. For example, in Mexico, households that used a subsidy to replace their old air conditioners ran their units more intensively, leading to a 3.4 percent increase in energy consumption during summer months.[36] This is an example of a rebound effect, i.e. reduction in expected gains from new technologies that increase the energy efficiency, because of behavioral or other systemic responses. In most cases, rebound effects of energy-efficient technologies are unlikely to fully offset potential energy savings. Combining engineering estimates with insights on human behavior from impact evaluations could help policymakers better predict how effective and cost-effective these programs can be. A 2016 review estimates that rebound effects range from 10–40 percent in low-income countries and 5–25 percent in high-income countries.[37]

iii. Accessible, convenient technologies can increase self-protection against air and water pollution

Free or low-cost chlorine can be a cost-effective way to increase self-protection from polluted water and increase access to safe drinking water. Randomized evaluations in Kenya have shown that low cost point-of-collection chlorine dispensers, in combination with encouragement from community promoters, can dramatically increase access to safe water compared to marketing bottled chlorine through retail outlets.[38] A study in Malawi showed that coupon and home delivery programs increased chlorine usage and improved child

[26] Allcott, Hunt and Todd Rogers. 2014. "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation." American Economic Review 104 (10): 3003-3037.

[27] Allcott, Hunt. 2011. "Social Norms and Energy Conservation." Journal of Public Economics 95: 1082-1095.

[28] Sudarshan, Anant. 2017. "Nudges in the Marketplace: The Response of Household Electricity Consumption to Information and Monetary Incentives." Journal of Economic Behavior and Organization 134: 320-335.

[29] Datta, Saugato, Juan José Miranda, Laura De Castro Zoratto, Oscar Calvo-González, Matthew Darling, and Karina Lorenzana. "A Behavioral Approach to Water Conservation: Evidence from Costa Rica." World Bank Policy Research Working Paper, June 2015.

[30] Ferraro, Paul J., and Michael K. Price. 2013. "Using Nonpecuniary Strategies to Influence Behavior: Evidence from a Large-Scale Field Experiment." Review of Economics and Statistics 95 (1): 64-73.

[31] Byrne, David P., Andrea La Nauze, and Leslie A. Martin. "Tell Me Something I Don't Already Know: Informedness and External Validity in Information Programs." Review of Economics and Statistics, (forthcoming).

[32] Andor, Mark Andreas, Andreas Gerster, Jörg Peters, and Christoph M. Schmidt. "Social Norms and Energy Conservation Beyond the US." Ruhr Economic Papers #714,

[33] Byrne, David P., Andrea La Nauze, and Leslie A. Martin. "Tell Me Something I Don't Already Know: Informedness and External Validity in Information Programs." Review of Economics and Statistics, (forthcoming).

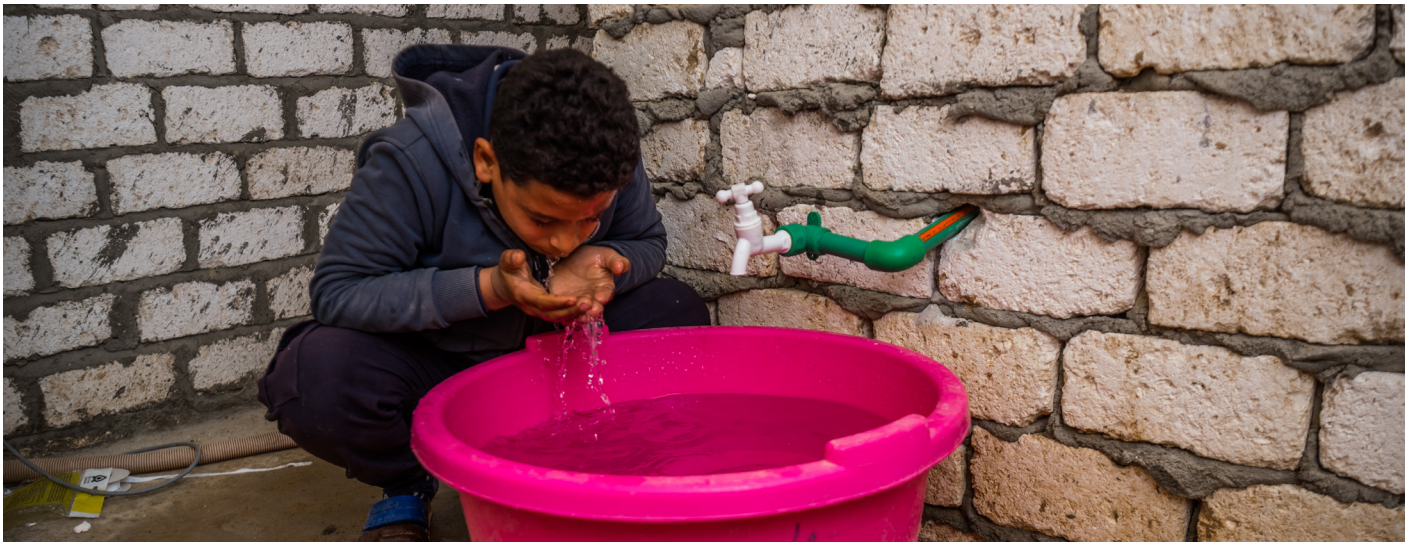
[34] Davis, Lucas W., Sebastian Martinez, and Bibiana Taboada. 2018. "How Effective is Energy-Efficient Housing? Evidence from a Field Experiment in Mexico". National Bureau of Economic Research. No. w24581.

[35] Ibid.

[36] Davis, Lucas W., Sebastian Martinez, and Bibiana Taboada. 2018. "How Effective is Energy-Efficient Housing? Evidence from a Field Experiment in Mexico". National Bureau of Economic Research. No. w24581.

[37] Gillingham, Kenneth, David Rapson, and Gernot Wagner. "The Rebound Effect and Energy Efficiency Policy." Review of Environmental Economics and Policy 10, no. 1 (2016): 68–88.

[38] Kremer, Michael, Jessico Leino, Edward Miguel and Alix Peterson Zwane. 2011. "Spring Cleaning: Rural Water Impacts Valuation, and Property Rights Institutions." The Quarterly Journal of Economics 126: 145-205.



EGYPT. Ahmed Emad © UNICEF/UN0639363/Emad

health outcomes. [39] Coupons were nearly two times more cost-effective in increasing chlorine usage and four times more cost-effective in averting illness than home delivery with 100 percent coverage. Similarly, in Zambia, researchers found that providing additional information about chlorine significantly increased the impact of price subsidies on demand for the product.[40] However, in the absence of a subsidy, information provision had no significant effect on take-up.

Accessible technologies are effective when they are suited to people's habits and preferences; otherwise, their impact will be low. In eight randomized evaluations of biomass cookstoves [41] that were designed to reduce smoke exposure or fuel use and positively impact health, five evaluations found they had little impact on measured outcomes including fuel consumption, smoke exposure, and/or health. [42] [43] [44] [45] [46] In most studies, people used the new stoves infrequently and continued to use their older stoves because the new stoves were not well adapted to people's cooking habits and/or required maintenance. These non-monetary costs of switching stoves likely dampened use. In contrast, improved stove use was much higher in Senegal and Kenya, where the new stoves were both well adapted to people's cooking preferences and habits and saved them time and money buying or collecting fuel. [47] [48] To reduce exposure to indoor air pollution and for cookstoves to succeed at scale, it is vital to have models of these technologies that are more affordable, desirable to use, help people save on fuel costs, and are easy to maintain and repair relative to their traditional alternative. As such, more research is essential to understand individuals' incentives to use technologies with environmental benefits.

iv. Utilizing social networks and tailoring financial products to the agricultural context can increase the adoption of productive technologies among farmers

Social networks are an effective means to diffuse information and increase the adoption of newer technologies. Agricultural practices and technologies, such as those that maintain soil fertility or manage water resources, can maintain or improve yields while also helping farmers adapt to climate change. However, learning about a new agricultural technology is fundamentally difficult for farmers. Evidence in Bangladesh highlighted that demonstration plots are an effective way to encourage the spread of information about new technologies since they trigger new interactions and conversations between farmers that may not belong to the same social network.

[39] Dupas, Pascaline, Basimenye Nhlema, Zachary Wagner, Aaron Wolf and Emily Wroe. 2021. "Expanding Access to Clean Water for the Rural Poor: Experimental Evidence from Malawi." American Economic Journal: Economic Policy, forthcoming.

[40] Ashraf, Nava, Kelsey Jack, and Emir Kamenica. 2013. "Information and Subsidies: Complements or Substitutes?" Journal of Economic Behavior Organization 88(2013): 133-139.

[41] Cookstoves that are designed to direct smoke away from users, generate fewer harmful emissions, or use less fuel are often proposed as potential solutions to this health and environmental challenge.

[42] Hanna, Rema, Esther Duflo, and Michael Greenstone. 2016. "Up in Smoke: The Influence of Household Behavior On the Long-Run Impact of Improved Cooking Stoves." American Economic Journal: Economic Policy 8, no. 1 (2016): 80-114.

[43] Mortimer, Kevin, Chifundo B. Ndamala, Andrew W. Naunje, Jullita Malava, Cynthia Katundu, William Weston, Deborah Havens et al. 2017. "A cleaner burning biomass-fuelled cookstove intervention to prevent pneumonia in children under 5 years old in rural Malawi (the Cooking and Pneumonia Study): a cluster randomised controlled trial." The Lancet 389, no. 10065 (2017): 167-175.

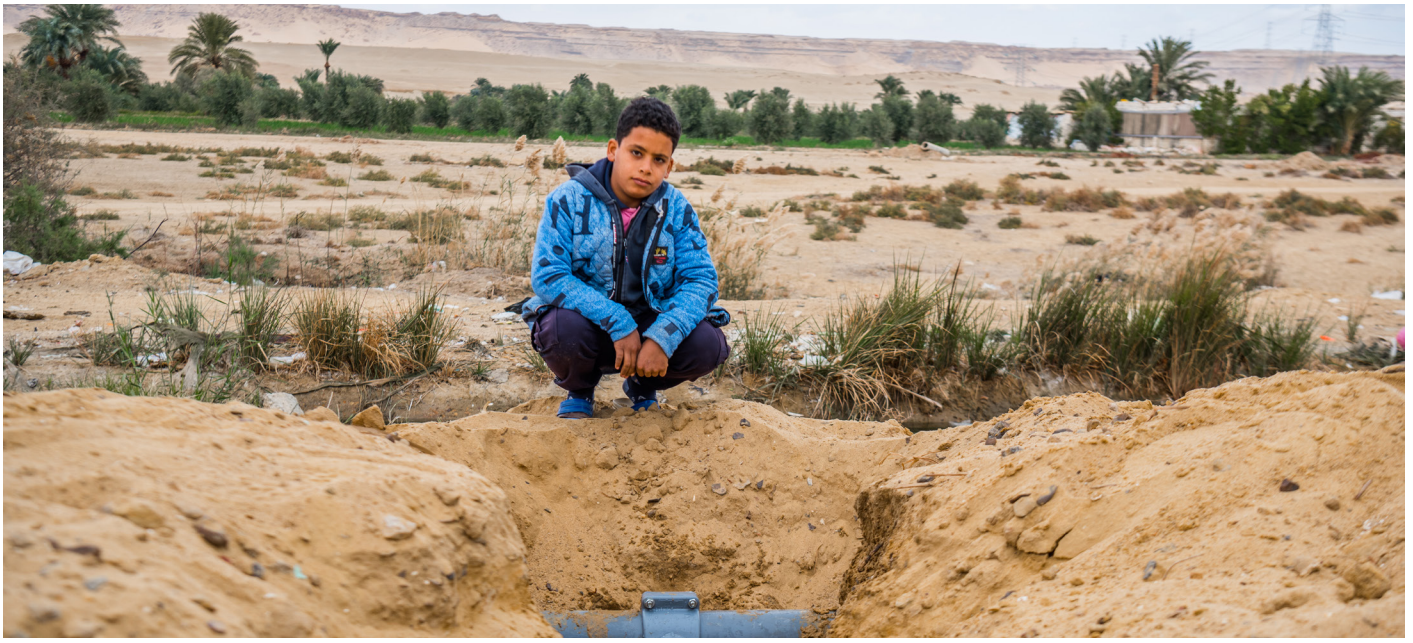
[44] Nightingale R, Lesosky M, Flitz G, Rylance SJ, Meghji J, Burney P, Balmes J, and Mortimer K. 2018. "Non-Communicable Respiratory Disease and Air Pollution Exposure in Malawi (CAPS): A Cross-Sectional Study." American Journal of Respiratory and Critical Care Medicine, 199, no. 5.

[45] Romieu, Isabelle, Horacio Riojas-Rodríguez, Adriana Teresa, Marrón-Mares, Astrid Schilmann, Rogelio Perez-Padilla, and Omar Masera. 2009. "Improved biomass stove intervention in rural Mexico: impact on the respiratory health of women." American Journal of Respiratory and Critical Care Medicine 180, no. 7: 649-656.[46] Gillingham, Kenneth, David Rapson, and Gernot Wagner. "The Rebound Effect and Energy Efficiency Policy." Review of Environmental Economics and Policy 10, no. 1 (2016): 68–88.

[46] Beltramo, Theresa, Garrick Blalock, Stephen Harrell, David I. Levine, and Andrew M. Simons. 2019. "The Effects of Fuel-Efficient Cookstoves on Fuel Use, Particulate Matter, and Cooking Practices: Results from a Randomized Trial in Rural Uganda." Working Paper.

[47] Bensch, Gunther, and Jörg Peters. 2015. "The intensive margin of technology adoption–Experimental evidence on improved cooking stoves in rural Senegal." Journal of Health Economics 42: 44-63.

[48] Berkouwer, Susanna B., and Joshua T. Dean. 2020. "Credit and attention in the adoption of profitable energy efficient technologies in Kenya." Working Paper.



COVER PHOTO: Ahmed Emad © UNICEF/UN0639401/Emad

Furthermore, diffusion through demonstration plots and selected entry points can help farmers learn even if they are not expected to benefit from the new technology. [49] Similarly, in Malawi, researchers leveraged social networks to disseminate information on two soil-enhancing techniques, pit planting and post-harvest composting. They found that providing performance-based incentives to farmers to deliver information to their peers increased adoption rates. [50] Beyond incentives, the selection of the messenger also mattered. Farmers were most convinced to adopt the new technologies when they shared a group identity with or faced similar agricultural conditions to the peer farmers who were training them on the new systems.[51]

Tailoring products to seasonality of agricultural production can improve the take-up and impact of credit. Since smallholders' income and input expenses are concentrated at harvests and planting seasons, credit tailored to the agricultural cycle may support smallholders' investments more effectively than traditional credit products. That is, timing credit offers and repayment requirements to account for these seasonal patterns can help encourage take-up and investment. In Kenya, loans were offered at the time of harvest to encourage farmers to sell when prices were highest, and 64 percent of farmers took up the loan offer.[52] In Zambia and Mali, lenders allowed farmers to delay repayment of a loan until after the harvest. In Zambia, in each of the two years offered loans, 98 percent of households opted to borrow, and agricultural output rose by 8 percent.[53] In Mali, smallholders who were offered loans repayable after harvest invested 11 percent more in inputs in the first year.[54]

Financial products can enable smallholders to invest more in productive technologies and practices when they help farmers overcome a lack of cash. Households who took up loans in Morocco invested more in agriculture and animal husbandry.[55] In Ethiopia, microcredit increased crop-related expenditures by 83 percent.[56] In Zambia, loans timed to provide farmers with cash or food between harvests allowed smallholders to work 23 percent less on others' farms for cash and hire labor to work on their own land.[57]

v. Promoting water conservation technology and risk-reducing seeds can increase resilience among vulnerable communities

Small-holder farmers that are more focused on stress-tolerant crops were more resilient to weather changes. Risk-mitigating technologies such as submergence-tolerant rice allow households to make production decisions, including input purchasing. Results from a randomized evaluation of a flood-tolerant rice variety in India showed that the rice significantly reduced yield losses during a flood year and did not reduce yields during

[49] Dar, Manzoor H., Alain de Janvry, Kyle Emerick, Erin M. Kelley, and Elisabeth Sadoulet. "Endogenous Information Sharing and the Gains from Using Network Information to Maximize Technology Adoption." Working paper, January 2019.

[50] Ariel BenYishay, A Mushfiq Mobarak. 2019 "Social Learning and Incentives for Experimentation and Communication". The Review of Economic Studies 86 (3): 976–1009,

[51] For more on farmer networks and technology adoption, see: Beaman, Lori, Ariel BenYishay, Jeremy Magruder, and Ahmed Mushfiq Mobarak. 2021. "Can Network Theory-Based Targeting Increase Technology Adoption?" American Economic Review, 111 (6): 1918-43.

[52] Burke, Marshall, Lauren Falcao Bergquist, and Edward Miguel. "Selling Low and Buying High: Arbitrage and Local Price Effects in Kenyan Markets" NBER Working Paper #24476, April 2018.

[53] Fink, Günther, Kelsey Jack, and Felix Masiye. "Seasonal Credit Constraints and Agricultural Labor Supply: Evidence from Zambia." NBER Working #20218, June 2014.

[54] Beaman, Lori, Dean Karlan, Bram Thuysbaert, and Christopher Udry. "Selection into Credit Markets: Evidence from Agriculture in Mali" Working paper, August 2015.

[55] Crépon, Bruno, Florencia Devoto, Esther Duflo, and William Parienté. 2015. "Estimating the Impact of Microcredit on Those Who Take It Up: Evidence from a Randomized Experiment in Morocco." American Economic Journal: Applied Economics 7 (1): 123–150.

[56] Tarozzi, Alessandro, Jaikishan Desai, and Kristin Johnson. 2015. "The Impacts of Microcredit: Evidence from Ethiopia." American Economic Journal: Applied Economics 7 (1): 54–89.

[57] Fink, Günther, Kelsey Jack, and Felix Masiye. "Seasonal Credit Constraints and Agricultural Labor Supply: Evidence from Zambia." NBER Working #20218, June 2014.

a non-flood year. Furthermore, farmers planting the flood-tolerant rice variety also planted more rice, used more fertilizer, and used better planting techniques.[58] [59]

Technologies for effective water management and conservation can help small-scale farmers cope with climate impacts. In Niger, researchers found that rainwater-harvesting technology helps farmers increase agricultural yields in the face of low and erratic rainfall, reversing land degradation and combating desertification. In addition, training was found to be a cost-effective and scalable means of promoting the adoption of this technology.[60] Similarly, in Kenya, researchers found that asset collateralized loans encouraged the purchase of rainwater harvesting tanks to better adapt to climate uncertainty.[61] While researchers in Bangladesh studied the impact of Alternate Wetting and Drying technology and different water pricing schemes on farmers' water conservation behavior. They found that encouraging the use of that technology only conserved water in areas where farmers already faced water prices by volume but had no effect in areas where farmers paid fixed irrigation charges for each acre cultivated.[62] The study highlights how efforts targeting agricultural productivity should recognize and leverage the value of water as a limited resource through a robust water pricing system.

Overall, evidence from randomized evaluations suggests that residential energy efficiency programs are not a cost-effective way to reduce CO2 emissions. Rather, households reduce consumption after learning how it compares to their neighbors via home energy reports. Additionally, there is evidence on self-protection from water and air pollution through technology adoption. However, while chlorine dispensers proved to be an effective means to protect oneself from the harms of pollution, cookstoves present little evidence that they are delivering their intended health and environmental benefits. Lastly, to increase the resilience of vulnerable communities to climate change, there are cohesive bodies of work encouraging tailoring financial products and services to the agriculture cycle and the promotion of water conservation technology, risk-reducing seeds, and nutritionally improved crop varieties, although more evidence is needed.

[58] Dar, Manzoor, Alain de Janvry, Kyle Emerick, David Raitzer, and Elisabeth Sadoulet. 2013. "Flood-tolerant Rice Reduces Yield Variability and Raises Expected Yield, Differentially Benefiting Socially Disadvantaged Groups." Scientific Reports 3: 3315.

[59] Emerick, Kyle, Alain de Janvry, Elisabeth Sadoulet, and Manzoor H. Dar. 2016. "Technological Innovations, Downside Risk, and the Modernization of Agriculture." American Economic Review, 106 (6): 1537-61.

[60] Aker, Jenny C and Jack, Kelsey. 2021. "Harvesting the Rain: The Adoption of Environmental Technologies in the Sahel". NBER Working Paper No. w29518, Available at SSRN: https://ssrn.com/abstract=3973316

[61] Ayres, I., Sophie, R., Alice, S. 2013. "Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage." The Journal of Law, Economics, and Organization 29 (5): 992-1022

[62] Jack, William G. and Kremer, Michael R. and de Laat, Joost and Suri, Tavneet. (2016). "Borrowing Requirements, Credit Access, and Adverse Selection: Evidence from Kenya". NBER Working Paper No. w22686, Available at SSRN: https://ssrn.com/abstract=2846902

[63] Chakravorty, Ujjayant and Dar, Manzoor and Emerick, Kyle. 2019. "Inefficient Water Pricing and Incentives for Conservation". CESifo Working Paper No. 7560, Available at SSRN: https://ssrn.com/abstract=3361362 or http://dx.doi.org/10.2139/ssrn.3361362

BIBLIOGRAPHY

Aker, Jenny C and Jack, Kelsey. 2021. "Harvesting the Rain: The Adoption of Environmental Technologies in the Sahel". NBER Working Paper No. w29518, Available at SSRN: https://ssrn.com/abstract=3973316

Allcott, H. 2011. "Social Norms and Energy Conservation." Journal of Public Economics 95: 1082-1095.

Allcott, Hunt. 2011. "Rethinking Real-time Electricity Pricing". Resource and Energy Economics, 33 (4): 820-842.

Allcott, H. 2015. "Site selection bias in program evaluation." The Quarterly Journal of Economics 130 (3): 1117- 1165.

Allcott, H. Todd, R. 2014. "The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation." American Economic Review 104 (10): 3003-3037.

Andor, A., Andreas, G., Jörg, P., Christoph, S. 2017. "Social Norms and Energy Conservation Beyond the US." Ruhr Economic Papers # 714

Arab Republic of Egypt Ministry of Environment. n.d. National Climate Change Strategy 2050. [online]. Available at: <https://www.eeaa.gov.eg/portals/0/eeaaReports/N-CC/EgyptNSCC-2050-Summary-En.pdf>

Arab Republic of Egypt Ministry of Water Resources and Irrigation. 2005. National Water Resources Plan. [online]. Available at: <http://gis.nacse.org/rewab/docs/National_Water_Resources_Plan_2017_en.pdf>

Ashraf, Nava, Kelsey Jack, and Emir Kamenica. 2013. "Information and Subsidies: Complements or Substitutes?" Journal of Economic Behavior Organization 88(2013): 133-139.

Ayres, I., Sophie, R., Alice, S. 2013. "Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage." The Journal of Law, Economics, and Organization 29 (5): 992-1022

Beaman, Lori, Dean Karlan, Bram Thuysbaert, and Christopher Udry. "Selection into Credit Markets: Evidence from Agriculture in Mali" Working paper, August 2015.

Beaman, Lori, Ariel BenYishay, Jeremy Magruder, and Ahmed Mushfiq Mobarak. 2021. "Can Network Theory-Based Targeting Increase Technology Adoption?" American Economic Review, 111 (6): 1918-43

Beltramo, Theresa, Garrick Blalock, Stephen Harrell, David I. Levine, and Andrew M. Simons. 2019. "The Effects of Fuel-Efficient Cookstoves on Fuel Use, Particulate Matter, and Cooking Practices: Results from a Randomized Trial in Rural Uganda." Working Paper.

Bensch, Gunther, and Jörg Peters. 2015. "The intensive margin of technology adoption–Experimental evidence on improved cooking stoves in rural Senegal." Journal of Health Economics 42: 44-63.

Berkouwer, Susanna B., and Joshua T. Dean. 2020. "Credit and attention in the adoption of profitable energy efficient technologies in Kenya." Working Paper.

Brandon, A., Paul, F., John, L., Robert,M., Michael, P., and Florian, R. 2017. "Do the Effects of Social Nudges Persist? Theory and Evidence from 38 Natural Field Experiments." NBER Working Paper No. 23277.

Burke, Marshall, Lauren Falcao Bergquist, and Edward Miguel. "Selling Low and Buying High: Arbitrage and Local Price Effects in Kenyan Markets" NBER Working Paper #24476, April 2018.

Byrne, David P., Andrea La Nauze, and Leslie A. Martin. "Tell Me Something I Don't Already Know: Informedness and External Validity in Information Programs." Review of Economics and Statistics, (forthcoming).

Chakravorty, Ujjayant and Dar, Manzoor and Emerick, Kyle. 2019. "Inefficient Water Pricing and Incentives for Conservation". CESifo Working Paper No. 7560, Available at SSRN: https://ssrn.com/abstract=3361362 or http://dx.doi.org/10.2139/ssrn.3361362

Clark, D., Joiner, S. and Bernard, S., 2021. How each country's emissions and climate pledges compare: A searchable dashboard of 193 countries' historical emissions and future climate targets. [online] Financial Times. Available at: <https://www.ft.com/content/9dfb0201-ef77-4c05-93cd-1e277c7017cf>.

Climatewatchdata.org. 2022. Data Explorer | Climate Watch. [online] Available at: <https://www.climatewatchdata.org/data-explorer/historical-emissions?historical-emissions-data-sources=cait&historical-emissions-gases=All%20Selected%2Call-ghg&historical-emissions-regions=All%20Selected%2CEGY&historical-emissions-sectors=total-including-

lucf%2Cenergy&page=1&sort_col=sector&sort_dir=DESC>.

Crépon, Bruno, Florencia Devoto, Esther Duflo, and William Parienté. 2015. "Estimating the Impact of Microcredit on Those Who Take It Up: Evidence from a Randomized Experiment in Morocco." American Economic Journal: Applied Economics 7 (1): 123–150.

Dar, Manzoor H., Alain de Janvry, Kyle Emerick, Erin M. Kelley, and Elisabeth Sadoulet. "Endogenous Information Sharing and the Gains from Using Network Information to Maximize Technology Adoption." Working paper, January 2019.

Dar, Manzoor, Alain de Janvry, Kyle Emerick, David Raitzer, and Elisabeth Sadoulet. 2013. "Flood-tolerant Rice Reduces Yield Variability and Raises Expected Yield, Differentially Benefiting Socially Disadvantaged Groups." Scientific Reports 3: 3315.

Datta, Saugato, Juan José Miranda, Laura De Castro Zoratto, Oscar Calvo-González, Matthew Darling, and Karina Lorenzana. "A Behavioral Approach to Water Conservation: Evidence from Costa Rica." World Bank Policy Research Working Paper, June 2015.

Davis, Lucas W., Sebastian Martinez, and Bibiana Taboada. 2018. "How Effective is Energy-Efficient Housing? Evidence from a Field Experiment in Mexico". National Bureau of Economic Research. No. w24581.

Dupas, Pascaline, Basimenye Nhlema, Zachary Wagner, Aaron Wolf and Emily Wroe. 2021. "Expanding Access to Clean Water for the Rural Poor: Experimental Evidence from Malawi." American Economic Journal: Economic Policy, forthcoming.

Emerick, Kyle, Alain de Janvry, Elisabeth Sadoulet, and Manzoor H. Dar. 2016. "Technological Innovations, Downside Risk, and the Modernization of Agriculture." American Economic Review, 106 (6): 1537-61.

Ferraro, J., and Michael, P. 2013. "Using Nonpecuniary Strategies to Influence Behavior: Evidence from a Large-Scale Field Experiment." Review of Economics and Statistics 95 (1): 64-73.

Fink, Günther, Kelsey Jack, and Felix Masiye. "Seasonal Credit Constraints and Agricultural Labor Supply: Evidence from Zambia." NBER Working #20218, June 2014.

Fink, Günther, Kelsey Jack, and Felix Masiye. "Seasonal Credit Constraints and Agricultural Labor Supply: Evidence from Zambia." NBER Working #20218, June 2014.

Fitch Solutions. 2020. Egypt Power Report. [online] Available at: <https://store.fitchsolutions.com/all-products/egypt-power-report> [Accessed 24 July 2022].

Gillingham, Kenneth, David Rapson, and Gernot Wagner. "The Rebound Effect and Energy Efficiency Policy." Review of Environmental Economics and Policy 10, no. 1 (2016): 68–88.

Hanna, Rema, Esther Duflo, and Michael Greenstone. 2016. "Up in Smoke: The Influence of Household Behavior On the Long-Run Impact of Improved Cooking Stoves." American Economic Journal: Economic Policy 8, no. 1 (2016): 80-114.

International Renewable Energy Agency. 2018. Renewable Energy Outlook Egypt. [online]. Available at: <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Oct/IRENA_Outlook_Egypt_2018_En_summary.pdf?la=en&hash=58DBAA614BE0675F66D3B4A2AC68833FF78700A0>

Jack, William G. and Kremer, Michael R. and de Laat, Joost and Suri, Tavneet. (2016). "Borrowing Requirements, Credit Access, and Adverse Selection: Evidence from Kenya". NBER Working Paper No. w22686, Available at SSRN: https://ssrn.com/abstract=2846902

Jessoe, K., Gabriel, L., Frank, L., Edward, S. 2017. "Spillovers from Behavioral Interventions: Experimental Evidence from Water and Energy Use." E2e Project Working Paper Series #33

Kremer, Michael, Jessico Leino, Edward Miguel and Alix Peterson Zwane. 2011. "Spring Cleaning: Rural Water Impacts Valuation, and Property Rights Institutions." The Quarterly Journal of Economics 126: 145-205.

Mortimer, Kevin, Chifundo B. Ndamala, Andrew W. Naunje, Jullita Malava, Cynthia Katundu, William Weston, Deborah Havens et al. 2017. "A cleaner burning biomass-fuelled cookstove intervention to prevent pneumonia in children under 5 years old in rural Malawi (the Cooking and Pneumonia Study): a cluster randomised controlled trial." The Lancet 389, no. 10065 (2017): 167-175.

Mounir, E., 2021. Egypt's desertification is ruining fields, cutting crops and displacing farmers. [online] openDemocracy. Available at: <https://www.opendemocracy.net/en/north-africa-west-asia/egypts-desertification-is-ruining-fields-cutting-crops-and-displacing-farmers/>.

Nightingale R, Lesosky M, Flitz G, Rylance SJ, Meghji J, Burney P, Balmes J, and Mortimer K. 2018. "Non-Communicable Respiratory Disease and Air Pollution Exposure in Malawi (CAPS): A Cross-Sectional Study." American Journal of Respiratory and Critical Care Medicine, 199, no. 5.

Ritchie, H., Roser, M. and Rosado, P., 2022. Egypt: Energy Country Profile. [online] Our World in Data. Available at: <https://ourworldindata.org/energy/country/egypt>.

Romieu, Isabelle, Horacio Riojas-Rodríguez, Adriana Teresa, Marrón-Mares, Astrid Schilmann, Rogelio Perez-Padilla, and Omar Masera. 2009. "Improved biomass stove intervention in rural Mexico: impact on the respiratory health of women." American Journal of Respiratory and Critical Care Medicine 180, no. 7: 649-656.

Sami, A., 2021. Agriculture in Egypt: Modern irrigation to the rescue. [online] Ahram Online. Available at: <https://english.ahram.org.eg/NewsContent/50/1202/412911/AlAhram-Weekly/Economy/Agriculture-in-Egypt-Modern-irrigation-to-the-resc.aspx>.

Sudarshan, A. 2017. "Nudges in the Marketplace: The Response of Household Electricity Consumption to Information and Monetary Incentives." Journal of Economic Behavior and Organization 134: 320-335.

Tarozzi, Alessandro, Jaikishan Desai, and Kristin Johnson. 2015. "The Impacts of Microcredit: Evidence from Ethiopia." American Economic Journal: Applied Economics 7 (1): 54–89.

Usaid.gov. 2022. Agriculture and Food Security | Egypt | U.S. Agency for International Development. [online] Available at: <https://www.usaid.gov/egypt/agriculture-and-food-security>.

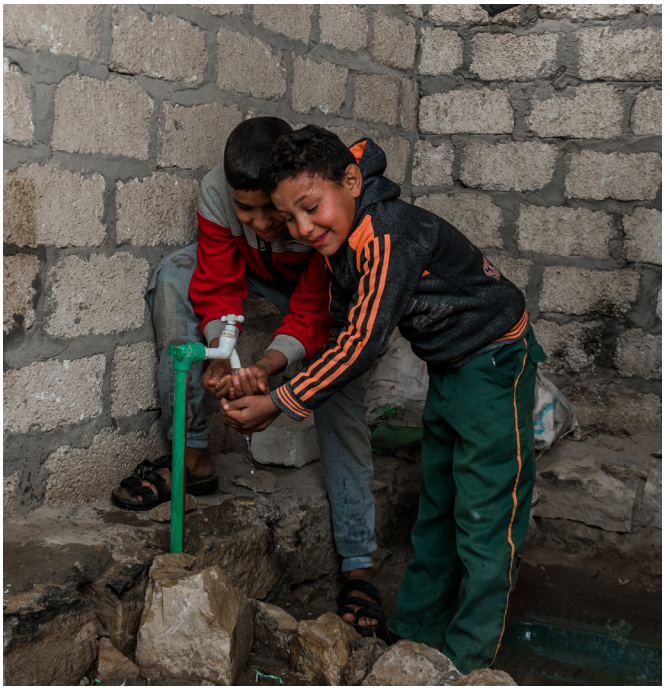
THE CASE FOR EVIDENCE: Why Evaluate? What are Evaluations? What are Randomized Evaluations?

Why Evaluate?

The purpose of evaluation is not always clear, particularly for those who have watched surveys conducted, data entered, and then the ensuing reports filed away only to collect dust. This is most common when evaluations are imposed by others. If, on the other hand, those responsible for the day-to-day operations of a program have critical questions, evaluations can help find answers. As an example, the NGO responsible for distributing chlorine pills may speak with their local field staff and hear stories of households diligently using the pills, and occasionally see improvements in their health. But each time it rains heavily, the clinics fill up with people suffering from diarrheal diseases. The NGO might wonder, "If people are using chlorine to treat their water, why are they getting sick when it rains? Even if the water is more contaminated, the chlorine should kill all the bacteria." The NGO may wonder whether the chlorine pills are indeed effective at killing bacteria. Are people using it in the right proportion? Maybe our field staff is not telling us the truth. Perhaps the intended beneficiaries are not using the pills. Perhaps they aren't even receiving them. And then when confronted with this fact, the field staff claims that during the rains, it is difficult to reach households and distribute pills. Households, on the other hand, will reply that they most diligently use pills during the rains, and that the pills have helped them substantially. Speaking to individuals at different levels of the organization, as well as to stakeholders, can uncover many stories of what is going on. These stories can be the basis for theories. But plausible explanations are not the same as answers. Evaluations involve developing hypotheses of what's going on, and then testing those hypotheses.

What are Evaluations?

The word "evaluation" can be interpreted quite broadly and have varying meanings to different people and organizations. Engineers, for example, might evaluate or test the quality of a product design, the durability of a material, the efficiency of a production process, or the safety of a bridge. Critics evaluate or review the quality of a restaurant, movie, or book. A child psychologist may evaluate or assess the decision-making process of toddlers. The researchers at J-PAL evaluate social programs and policies designed to improve the well-being of the world's poor. This is known as program evaluation. Put simply, a program evaluation is meant to answer the question, "How is our program or policy doing?" This can have different implications depending on who is asking the question, and to whom they are speaking. For example, if a donor asks the NGO director "How is our program doing?" she may imply, "Have you been wasting our money?" This can feel interrogatory. Alternatively, if a politician asks her constituents, "How is our program doing?" she could imply, "Is our program meeting your needs? How can we make it better for you?" Program evaluation, therefore, can be associated with positive or negative sentiments, depending on whether it is motivated by a demand for accountability versus a desire to learn.



EGYPT. PHOTO: UNICEF/UN0639412/Emad

J-PAL works with governments, NGOs, donors, and other partners who are more interested in learning the answer to the questions: How effective is our program? This question can be answered through an impact evaluation. There are many methods of conducting impact evaluations; J-PAL focuses on randomized evaluations.

What are Randomized Evaluations?

A randomized evaluation is a type of impact evaluation that uses random assignment to allocate resources, run programs, or apply policies as part of the study design. Like all impact evaluations, the main purpose of randomized evaluations is to determine whether a program has an impact, and more specifically, to quantify how large that impact is. Impact evaluations measure program effectiveness typically by comparing outcomes of those (individuals, communities, schools, etc.) who received the program against those who did not. There are many methods of doing this, but randomized evaluations are generally considered the most rigorous and, all else equal, produce the most accurate (i.e. unbiased) results.

At a very basic level, a randomized evaluation can answer the question: Was the program effective? But if thoughtfully designed and implemented, it can also answer the questions, "How effective was it? Were there unintended side-effects? Who benefited most? Who was harmed? Why did it work or not work? What lessons can be applied to other contexts, or if the program was scaled up? How cost-effective was the program? How does it compare to other programs designed to accomplish similar goals?"