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Impact of Weather Shocks on MENA Households

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Introduction: Do households living in climate affected areas in the MENA region believe that changes in climate patterns and their environment are taking place? Have households been affected by extreme weather events, and if so to what extent and which events have had the largest impact? What are the coping strategies that households declare having used, or could be using to cope with climate change and weather shocks? And what are the implications for policy? A new World Bank Study by Wodon et al. (2014) helps in answering these questions.

It is widely recognized that MENA will be strongly affected by climate change. The frequency and severity of extreme weather shocks is expected to increase. Yet, the evidence on how households are already affected and whether they can cope and adapt to changing climatic conditions is limited. The study by Wodon et al. (2014) helps fill these knowledge gaps. It is based in large part on new household surveys and qualitative data from climate affected areas in Algeria, Egypt, Morocco, Syria, and Yemen. The study provides insights on household perceptions of, and vulnerability to, extreme weather shocks.

Perceptions and Impacts of Weather Shocks on Households: Questions on perceptions of climate change and its impact on households were asked in the household surveys with a focus on events and changes that took place in the last five years.



Table 1 suggests that households do believe that weather patterns have been changing. In the combined sample for the five countries more than three fourths of households declare that rain is more erratic, and almost three quarters note higher temperatures. Between half and two thirds declare that rain is less frequent today than five years ago, that the land is dryer or less fertile, that the rainy season starts later, is shorter, or ends earlier, and that droughts are more frequent. Changes in climate appear to lead to more diseases in animals and livestock, more insects and pests in crops, less water in boreholes, rivers, lakes or streams, more air pollution, more frequent crop failures and livestock loss, and more soil erosion. Some of the extreme weather events associated with climate change such as rain storms and floods are however not perceived as more frequent by a majority of households, and in some cases, households suggest that temperatures are becoming cooler with more rain, but this is the case only for a minority of households. Overall, while there are differences between households and areas or countries, there is a clear perception that the climate is worsening. And as shown in table 2, extreme weather events such as droughts and floods have led to losses in incomes, crops, or livestock for many households in these climate affected areas.

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Table 1: Perceptions of Climate Change, Last Five Years, Five Countries Sample, 2011 (%)

Perception	%	Perception	%
Rain more erratic	77.52	More diseases in animal and livestock	57.45
Temperature is hotter	72.37	More insects and pests in crops	56.31
Less Rain	66.57	Less water in boreholes, rivers, lakes or streams	56.11
Land is dryer	64.84	More air pollution	55.59
Less fertile land	62.24	More frequent crop failure	55.36
Rainy season starts later	60.53	Rainy season end earlier	54.00
Rain season is shorter	60.24	More frequent livestock loss	52.47
More frequent droughts	59.09	More soil erosion	52.43

Source: Adoho and Wodon (2014a).

Table 2: Economic Impacts of Weather Shocks, Five Countries Sample, 2011 (%)

	Quintiles					All
	Poorest	Q2	Q3	Q4	Richest	
Lost income	46.37	44.14	43.21	29.25	20.72	36.59
Lost crops	58.12	61.96	62.13	49.42	42.10	54.62
Lost livestock or cattle	23.81	25.19	30.11	23.17	15.23	23.43
Less fish caught	9.51	10.27	8.90	9.65	4.69	8.60

Source: Adoho and Wodon (2014a).

In focus groups most respondents noted long-term shifts in climate and attributed declining agriculture to deteriorating environmental conditions caused by changing weather patterns. For crops such as potatoes, wheat, and rice, the results may be devastating: *“Rice is burnt in some seasons, because we cannot find enough water to irrigate it”* (Male, 36-45 years old, Egypt²). The inability to earn a stable income for crops makes it difficult to rely solely on agriculture as a source of revenue. *“The conditions [for] farming are very poor. There’s drought on one hand and the unavailability of the new equipment and poor methods we use on the other hand. ... All farmers in this region have been affected by drought and lost their yields (Male, 35-45 years old, Algeria).”* In Yemen, Hudaydah residents emphasized the problems of hot weather and increasing heat waves. Also, unfavorable crop prices have led some to shift from food crops to qat – more profitable but requiring a great deal of water: *“People there [in villages] work shoulder to shoulder, but the problem lies in agriculture. They have stopped cultivating crops, replacing them with qat”* (Male, 30-39 years old, Yemen).

Additional information on perceptions of the climate, weather shocks, and their impact on households is available for Morocco via special

² In the case of Egypt, the fact that much of agriculture is irrigated means that results, including quotes from the qualitative work, must be interpreted with care. When farmers are faced with lack of water, as this quote suggests, this may be related to shortages in the allocation of irrigation water which can themselves be due to any number of problems that need not be related to climate change, such as the upstream use of the Nile water by others.

modules on climate change and shocks in a 2009-10 survey. In the survey, 28.1% of households were involved in agriculture, and among those 92.1% said they were affected by deteriorating climatic conditions in the last five years. The most likely shock was decreasing agricultural yields due to inadequate rainfall, reported by 62.2% of households. In a separate part of the survey, over one in five households noted being impacted by recent weather shocks like droughts or floods. Most affected households declared an inability to recover, especially poorer ones. A regression analysis showed that households in the top quintile of wealth were 20% more likely to recover than those in the bottom quintile.

Table 3: Weather Shocks and Impact on Agriculture, Morocco 2009-10 (%)

	Poorest Quintile	Wealthiest quintile	All
Household has a member involved in agriculture or related activities	70.69	5.30	28.07
Among household in agriculture, share affected by climate-related shock			
Reduction in agricultural yields due to inadequate rainfall	60.98	50.35	62.18
Reduction in agricultural yields due to too much water	39.89	19.15	38.17
Poor soil quality due to erosion reducing agricultural yields	22.91	16.51	21.80
Changing and unpredictable climate and temperatures reducing agricultural yields	34.84	22.89	34.51
Pest or locust infestation reducing agricultural yields	14.13	7.08	17.21
Reduced job opportunities in the agricultural sector	43.75	34.15	43.86
Death of livestock due to bad weather conditions	28.37	10.41	26.44
Reduction in stock of livestock due to lower availability of grazing land	37.55	10.61	31.24
At least one problem in the last five years	93.09	81.20	92.10

Source: Nguyen and Wodon (2014a).

Coping and Adaptation Strategies: What are the coping strategies that households declare having used or could use to cope with climate change and weather shocks? In the five country sample, 60.6% of households declare that in case of a weather shocks they have used or would use savings, 46.8% have sold or would sell their assets, 46.2% asked for a loan or would do so, 40.6% sold or would sell their livestock, and 36.4% have or would withdraw children from school. The proportions of households using these coping strategies are higher among lower quintiles which have fewer other means to cope. There are also differences between countries, especially on withdrawing children from school – in Egypt most households do not consider this an option. Also, households receiving international remittances, who tend to be better off, are less likely to resort to these coping strategies, except using their savings. The qualitative focus groups also reveal similar coping strategies, such as selling

assets, shifting food consumption, and taking children from school to support the household.

Households were also asked about actions that they took or might take to adapt to weather shocks and environmental changes. As shown in table 4, between one in four and one in five households have relied or would rely more on stored grains/products and stored water, have sought or would seek off-farm work, used or would use more fertilizers or pesticides, and made or would make a change in farming technology. Undertaking training for non-farm work or changing crop mixes and varieties is mentioned by about 15% of households, versus only 9% for changing the crop/livestock mix. Thus most households do not implement many adaptation strategies. More than four in ten households say that they know people who have moved out of the area due to climate pressures, and 14% say that some people have moved in, which may generate conflict over water, land, and livestock.

Table 4: Adaptive Strategies of Households to Deal with Climate Change and Shocks (%)

	Change in production technology	Change in crops mix or varieties	Change in crops vs. livestock	More fertilizers/pesticides	Seeking non-farm work	Training for non-farm work
Share of households	19.35	15.53	8.89	21.12	22.67	15.09
	Use of stored water	Stored grains/products	People moving out	People moving in	Conflict over land, livestock	Conflict over water
Share of households	20.54	28.37	40.29	13.99	12.85	8.35

Source: Wodon and Adoho (2014b).

The qualitative data suggest that residents often rely on each other to cope and adapt: *“Rural residents are willing to pay [give] half of what we have to help others. If I have 10 pounds, I will pay 5. If I have 100 pounds, I will pay 50. This is how the social norms work here. We are all one family”* (Male, 36-45 years old, Egypt). Yet solidarity does not always work, and conflicts over natural resources occur due to changes in climate. In Yemen rural residents worried that water scarcity has led to conflict over access to wells. One Yemeni woman described a water distribution scheme where water is distributed to certain communities on certain days of the week. For farmers in all five countries, living in impoverished rural areas is not only financially difficult, but also has negative impacts on health, a concern mentioned in Egyptian focus groups. Farmers may be increasingly exposed to contaminated water because waste leaks into irrigation canals. Others mention being sick and with limited income, many households cannot

afford quality health care and often cannot access health facilities.

Community Level Responses: What about community level responses? Households were asked whether to cope with the loss of crops, income or livestock due to weather shocks or environmental changes, their communities did any of the following: planting trees or installing soil protection measures; building banks on rivers, streams or small check banks to reduce flooding; developing new infrastructure such as boreholes, wells, irrigation or roads; gathering and disseminating information on measures to reduce losses in crops, income or livestock; taking measures to prepare for future disasters like floods or droughts; actions to improve market access for agricultural products or handicrafts; and taking action to purchase seeds, animals or farm equipment. In most cases community action is limited. One in five households declare that the community has planted trees or taken soil erosion measures, and one in seven mentioned purchasing seeds, animals or farm equipment. Other actions are mentioned by one in ten households or less.

Government Engagement: Similar questions were asked about government support, with in addition questions about the availability of transfers and social protection programs, such as cash or food for work programs, cash for food during floods and droughts, and provision of drinking water, skills training programs, credit during crop losses, improvements in market access through transportation, and price support for crops when prices are low. Except for the provision of drinking water, which is probably less related to weather shocks and climate change than many other potential responses included in the questionnaire, the government involvement in and support for adaptation strategies was limited as well. For most programs, only about one in ten households declared that the government has been active.

The fact that community and government programs to help households cope with weather shocks and adapt to climate change are the exception rather than the rule was also a conclusion of the qualitative work. When asked about such programs, respondents said that they were aware of only very few programs and organizations geared to assist the rural poor affected by climate change. Participants

suggested areas where government could help, i.e. the provision of agricultural inputs or loans to purchase machinery. Job training and improved employment opportunities were also mentioned. Yet some respondents, especially in Yemen, were doubtful that government program would bear fruit, due to corruption and distrust.

Conclusion and Policy Implications: Decision making for climate change adaptation requires first assessing climate risks, impacts, and opportunities for action before prioritizing policies and projects, implementing responses, and monitoring outcomes. The study reviewed in this note falls within the first of these steps: it seeks a better understanding of perceptions of climate change, environmental degradation, and extreme weather events, their impact on households, and the strategies used by households to cope and adapt (the study also looked at the impact of weather shocks on migration, discussed in a separate Quick Note). Quantitative and qualitative data collection was undertaken in climate-affected areas in five countries.

The analysis suggests that most households perceive important climatic changes. The coping and adaptation strategies used by households to deal with shocks can be diverse, including migration, selling assets and taking other emergency measures, as well as changing sources of livelihoods such as crops, livestock production, and off-farm work among others. Yet many households do not appear to be able to use most of these strategies, and the extent to which they benefit from community and government programs and initiatives to help cope with weather or environmental changes is limited.

Affected communities call for more government action to help with coping and adaptation. Households in vulnerable rural areas are seriously affected by climate change and weather shocks, and the extent to which they are able to cope and adapt to these shocks is limited. The cost of climate change and weather shocks is already felt today by many rural households. They are essentially left on their own in the absence of strong community responses and government programs. While the study did not provide a cost-benefit analysis assessing which types of programs might help households the most in rural sending areas, it does demonstrate the need for more assistance to help households cope and adapt, given the substantial damage already caused to

livelihoods by changing weather patterns. The populations in the study perceive a lack of effective government interventions to address the impact of weather shocks, and collective action solutions do not seem to work. The gap in the public provision and financing of adaption interventions leaves individuals and communities alone in making choices and decisions. Although this leaves space for private initiatives, it also leaves households and communities vulnerable to forms of uncoordinated action that may lead to conflict and maladaptation.

MENA governments should be encouraged to adopt and expand the coverage of their social protection and safety net programs. The coverage of those programs appears very thin in the areas surveyed, and is insufficient to protect households from weather shocks. Investments in safety net systems could have immediate pay-offs in the short-run and also in the long-run when consequences of climatic change become even more severe. It is important to highlight that the design, coverage and placement of safety net programs would not only help reduce the negative consequences of climate change; safety nets should also be seen as an integral part of the broader strategy for poverty reduction and urbanization. They should help provide portable skills and human capital to those that need them the most in climate affected area. These recommendations on safety nets are not specific to climate-induced weather shocks, but they do matter in this context as well as more generally.

References

Wodon, Q., A. Liverani, G. Joseph, and N. Bounoux, editors, 2014, *Climate Change and Migration: Evidence from the Middle East and North Africa Region*, World Bank Study, Washington, DC: The World Bank.

[The other references mentioned in this note are available as individual chapters in the above study.]

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