Longitudinal Research on Environmental Change and Migration

A Workshop on Objectives, Methods, and Applicability to Policy and Practice

March 19-20, 2015

World Bank, Washington, DC

KNOMAD Thematic Working Group on Environmental Change and Migration

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1. Executive Summary

On March 19-20, 2015, the KNOMAD Thematic Working Group on Environmental Change and Migration held its international workshop at the World Bank in Washington, DC. The workshop focused on the role of longitudinal data collection and analysis in improving understanding of three principal issues: the determinants of environmentally-induced migration, the impacts of these movements on the migrants as well as communities of origin and destination, and the long-term efficacy of migration as an adaptation mechanism as well as the long-term efficacy of strategies to reduce emigration pressures. The goal of the workshop was to identify priorities for longitudinal research and make recommendations on the best ways to accomplish such studies. The workshop resulted in four major findings as well as recommendations for next steps.

First, longitudinal studies are needed to understand more precisely the processes through which environmental change influences decisions to migrate. Recognizing that environmental change intersects with economic, political, social and demographic factors, longitudinal research helps unpack these factors. Longitudinal research is particularly important in understanding the effects of slow-onset environmental processes, such as rising sea levels, and recurrent acute environmental events, such as floods, cyclones, and heat waves, by identifying tipping points influencing the decision to migrate. This research also helps identify the long-term human-made environmental challenges that speed up the process of degradation in many regions, such as the depletion of mangroves or the construction of infrastructure projects.

Second, longitudinal research allows for better understanding of the long-term effects of different migration-related adaptation strategies, both at the household and national or governmental levels. These strategies may aim at reducing or mitigating emigration pressures, including the economic and social factors that interact with environmental change factors, to permit people to remain *in situ*, or they may facilitate migration as part of a mix of strategies to promote adaptive capacity. Understanding the long term impacts will help policymakers and practitioners undertake better planning and implementation.

Third, methodologies for longitudinal research differ from traditional migration research. Traditional research often provides a snapshot rather than perspective on change in migration patterns or their impacts over time. Longitudinal research requires baseline information and subsequent data points to better capture when people move, under what circumstances and with what impacts. This type of research is able to highlight whether migration and mobility are occurring for the first time or are part of an existing migration system. Longitudinal data is also more precise than short-term data because it excludes assumptions that are associated with seasonal occurrences of environmental change, such as the shifting of the coastline.

Fourth, longitudinal evaluation of migration as an adaptation strategy in the context of environmental change is extremely important. Evaluation should inform program and research design and provide information to governments about best practices for addressing migration in the context of environmental change. Such evaluation is particularly important in the context of planned relocation, in which governments play a role in facilitating or even requiring that people move because of environmental changes that preclude continued residence in a particular location. Longitudinal data is particularly useful in identifying the long-term gendered impacts of adapta-

tion programs on the affected populations, and longitudinal data, unlike short-term data, can address the complexity of the migration process itself. Only longitudinal research can identify the long-term impacts of adaptation programs on the affected populations.

Finally, workshop participants agreed upon next steps: meeting with governments affected by environmental change as well as donors about the importance of longitudinal research; improving research designs, including standardization of terms and identification of best ways to measure change; stocktaking of existing programs, surveys, and statistical technology that can inform new programs and research; and creation of toolkits for local governments and civil society for addressing migration in the context of environmental change.

2. About the Workshop

In an effort to synthesize existing knowledge and generate new knowledge to guide policy decisions regarding migration and development, The Global Knowledge Partnership on Migration and Development (KNOMAD) has commissioned thirteen Thematic Working Groups (TWGs). In order to better understand the impacts of environmental change on migration patterns and their effects on development, a specific working group has been created to gather scholars who have engaged in recent research on the subject with policymakers, practitioners, and donors. The group is composed of representatives of key institutions with interest in environmental change and migration as well as leading researchers in the field. The TWG on Environmental Change and Migration focuses on three forms of mobility, as outlined in the Cancún Adaptation Framework. Paragraph 14(f), which invited States to undertake 'measures to enhance understanding, coordination and cooperation with regard to climate change induced *displacement*, *migration* and *planned relocation*, where appropriate, at national, regional and international levels.'

On March 19-20, 2015, the TWG on Environmental Change and Migration led an international workshop at the World Bank in Washington, DC in order to focus on the role of longitudinal data collection and analysis in improving understanding of three principal issues: the determinants of environmentally-induced migration, the impacts of these movements on the migrants as well as communities of origin and destination, and the long-term efficacy of migration as an adaptation mechanism as well as the long-term efficacy of strategies to reduce emigration pressures.

The workshop stemmed from the conclusions of a symposium that discussed research priorities regarding environmental change and migration hosted by KNOMAD on May 28-29, 2014.[1] The goal of the symposium was to examine current knowledge about the interconnections between the environment and migration, discuss the policy implications of what is known, identify issues and methods to fill gaps in knowledge, and develop a research agenda to improve future evidence-based policymaking in this area. The working group also seeks to publish papers to further research and knowledge in these areas, and the workshop included the presentation of three papers to be published focusing on adaptation strategies. There was general consensus among par-

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[1]Symposium on Environmental Change and Migration: State of the Evidence* May 28-29, 2014 World Bank, Washington DC http://www.knomad.org/powerpoints/environmental_change/KNOMAD_Symposium_Report_Final_TWG11%20(final%20version).pdf

ticipants at the symposium that longitudinal research designs should be put in place now to further understanding of the interconnections between migration and environmental change. The participants recommended a follow-up workshop to set priorities for such research.

The March 2015 workshop was structured around three sessions and one public event. On the first day, participants explored longitudinal research on the environmental determinants of migration and longitudinal research on the impacts of environmentally induced migration. The public event was a presentation of three papers on resilience and vulnerability as a determinant and impact of environmentally driven mobility. The second day involved discussions about longitudinal evaluations of migration-related adaptation programs. For each topic, roundtable discussion was followed by smaller breakout groups that aimed to develop specific proposals and guidelines for addressing the topic. The goal of the workshop was to identify priorities for longitudinal research and make recommendations on the best ways to accomplish such studies.

The complete agenda can be found in Annex 2.

3. Nature of Longitudinal Research

Longitudinal research is "research in which (a) data are collected for each item or variable for two or more time periods, (b) the subjects or cases analyzed are the same or at least comparable from one period to the next; and (c) the analysis involves some comparison of data between or among periods."[2] Longitudinal research can be prospective (studying changes to happen in the future) or retrospective (studying changes that have already taken place). The former generally are panel studies in which the same individuals or households are interviewed at repeated sequences to determine what changes have occurred. In the latter, respondents are asked to reconstruct their experiences in order to gain understanding of the changes that occurred in the past. Longitudinal studies do not always require that the same individuals are interviewed or observed over time. Repeated cross sectional studies—that is, research that applies to a single time interval with different respondents—can be constructed to permit comparison over time if the same information is solicited from comparable respondents during each round of data collection.

Three types of longitudinal studies are needed to improve policies and programs aimed at addressing the impact of environmental change on migration. First are studies that focus on the determinants of migration. Longitudinal research may help understand the distinctions between recurring movement in the face of repetitive shocks and first or only movements. They will also help determine the extent to which movements related to slow onset processes, such as rising sea levels, result in different forms of movement over time. Environmental degradation is often a long-term process, even before the onset of climate change-related challenges, creating rapid-onset situations which are often difficult to address. It is important to note that determinants of migration are dynamic; the rate and pace of change of these determinants change rapidly due to climate change, and these are often non-linear changes. In this respect, longitudinal data could help draw conclusions about longer-term occurrences such as climate change.

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[2] Scott Menard (2002). Longitudinal Research: Second Edition. Thousand Oaks, CA: Sage Publications, Inc., p. 2.

Second, there is need for longitudinal research on the longer-term impacts of migration on those who move in the context of environmental change. This type of research would examine spontaneous movements of people, focusing on both anticipatory migration and displacement. Such studies would also help identify the impacts of such movements on communities of origin and destination. Among issues to be examined are the economic impacts (employment, wages, income and assets), fiscal effects at the local, regional and national levels, as well as the social, cultural, gendered, political, environmental and other factors that are influenced by human mobility. Longitudinal research provides useful information in determining which individuals, households and communities benefit from migration as compared to those who do not fare as well.

Third, longitudinal studies are needed to assess the long-term impacts of programs that are supported and implemented by governments to help people adapt to climate and other environmental changes, including those involving movements of people. These adaptation programs may be aimed at ameliorating the factors that cause people to be displaced, or they may be planned relocation programs to help people adapt to environmental changes. These programs should work in combination with development policies, especially those targeted at poverty reduction. There is no legal definition of planned relocation but a working group assembled by the UN High Commissioner for Refugees, Brookings Institution and Georgetown University has proposed a working description: *Planned relocation is a process in which persons or groups of persons are moved away from their homes, settled in a new location, and supported to rebuild their lives. Planned relocation involves the state, generally takes place within national borders, and is undertaken for reasons linked to disaster, environmental change and/or the effects of climate change.* Economic, social, cultural and other impacts are likely to change as people move through the adaptation process. Impacts on would-be and actual migrants as well as their communities of origin and destination are also likely to change as planned relocation takes place. Understanding the long-term effects of different adaptation strategies will help policymakers and practitioners undertake better planning and implementation in order to protect the population.

4. Environmental Change as a Determinant of Movement

Identifying the determinants of movement, whether migration, displacement, or relocation, is important to build an understanding for researchers, practitioners, and policy makers of the factors that influence individual, household and community decisions to move. While migration in the context of environmental change may be classified as a unique phenomenon, it is often difficult to separate it from migration spurred by other events. Economic, social, demographic, cultural, and political factors may also play a significant role in the decision-making processes of those who migrate and those who choose to stay. It is a challenge to understand the decision-making process for those who choose to move and those who choose not to, since perceptions of what is happening may be very different from what is actually happening; how individuals perceive drivers is often very different from objective data, which makes research on drivers very difficult. Additionally, the existence of migration-related networks and agencies facilitate migration and determine the reach and frequency of mobility. Thus, when studying migration in the context of environmental change, it may be difficult to attribute specific migration choices to specific environmental processes or events.

While specific weather shocks or slow onset processes of change tied to climate change may be a factor in households' decision to move, the perception of the severity or likelihood of future weather events may be just as significant. Longitudinal studies may help identify why some people leave and others remain behind when facing very similar environmental challenges as these factors change over time.

A linear understanding of migration drivers and consequences may not address the complexity of interaction between external forces, perceptions, and capacity. Rather than migration being the end of the chain of events, past migration may have an influence on the determinants of future movements. Determinants of migration are dynamic, responding to climate change events as well as political, economic, social, and cultural factors. This provides an additional challenge to researchers of migration in the context of environmental change, as households are likely to move multiple times, influenced by their own experiences with migration as well as weather events.

Attribution serves practical purposes for policy makers. In order to plan strategically to mitigate or prevent migration or to plan for future migration, policy makers and practitioners need to be able to link determinants of migration with specific migration flows as well as understand the duration, destinations, and composition of the flow in order to act effectively. Attribution serves social planning needs; governments want to know where people will move, what resources they will need, how the economy will be affected in destination communities, and how migration will affect the political balance of the state. Migration has the capacity to affect voting patterns and socioeconomic factors significantly, and providing clear attribution of migration flows to specific weather events (or other specific factors that encourage migration) allows policy makers to plan for and address migration and its consequences. It is important that the political considerations associated with migration are taken into account when discussing and addressing attribution; if research does not discuss attribution, it risks losing its relevance to decision makers.

Attributing determinants of migration may also help in changing policy makers' negative view of migration; if migration is seen as an event for which the state can plan, it may be possible for lawmakers to view migration as an adaptation strategy and an opportunity to bring new skills and labor into different communities through migration. Although out-migration may pose a risk to a community, emigrated persons may be able to provide help and support local livelihoods to cope with environmental shocks, and this possibility should be pronounced and enhanced when addressing policymakers. Migration can be a method to bring resources to a community over time.

However, claiming "pure" attribution, whether mono- or multicausal, is extremely problematic. It is difficult to prove that migration was caused solely or primarily by environmental change. Many factors influence households' decisions to migrate, and it is difficult to know whether environmental change acts in conjunction with other facts or whether it influences the decision at all. Focusing solely on the push factors causing migration is problematic because these determinants do not account for the role of pull factors in households' decisions, and encourages the view that migration is problematic, rather than an adaptation strategy.

A focus on the "soft" side of migration, incorporating the effect of perception and culture on migration, could help provide a clearer view of migration strategies. Additionally, both retrospec-

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tive and panel data should attempt to measure both determinants of resilience and adaptive capacity as well as indicators of resilience and adaptation. While attribution is difficult, surveying those who do not move compared to those who do provides the best change of claiming attribution for the decision to migrate.

5. Migration as an Adaptation Strategy

Individuals and households may respond to climate-related challenges in a variety of ways, using the different assets at their disposal. People may employ many different coping mechanisms and livelihood strategies, including adaptive capacity. Adaptation is "the process of adjustment to actual or expected climate and its effects" (IPCC 2014:5) , and adaptive capacity is the "ability to adjust, take advantage of opportunities, or to cope with consequences" (IPCC 2014) The key component of adaptation is the development of the capacity to adapt to climate change and variability. Increasing adaptive capacity leads to the building of resilience. It may be difficult to measure adaptive capacity or resilience, however, thus making research on the impacts of migration as an adaptation strategy difficult. The impacts of migration also evolve quickly, which makes defining measurement tools problematic. Most measurement relies on an asset-based assessment, but this may not be at the root of real adaptive capacity.

Weather shocks affect different populations in different ways, leading to different forms of mobility. Individuals and households may decide to move because climate shocks affect living conditions, in which communities face a physical threat and need enhanced infrastructure to offer protection; climate shocks may also affect livelihoods, causing people to become unable to earn a living, especially populations who rely on natural resources, in which case their vulnerability results from the lack of alternative income-generating opportunities. These different types of risk and vulnerability impact both the decision to migrate as well as the interventions that can be used to mitigate or facilitate movement. There are three major forms of mobility—anticipatory migration (that is, movements initiated by individuals and households in anticipation of worsening conditions), displacement (that is, involuntary movements in reaction to environmental change), and planned relocation (that is, through programs often initiated or supported by governments that require or assist people's resettlement in other locations). In order to cope with changing environmental conditions, households may migrate temporarily or permanently; they may move within the same country or move across the region or continent. Current research indicates that most of those affected by environmental change will move internally or cross border into neighboring countries. Choice of destination is often determined by the type of climate-related challenge; households responding to sudden-onset environmental events are likely to remain in their home country, whereas households responding to gradual processes may seek livelihood and labor opportunities both within their home country and in neighboring states.

Who migrates often depends on the pre-existing levels of vulnerability and resilience. The wealthiest sectors of society can afford to act, and this type of migration can be an effective adaptation tool. This migration may also benefit those who stayed behind through remittances. Migration may not be feasible, however, for the poorest segment of the population, who are often those most adversely affected by climate shocks. Migration is costly, and the poorest populations may not be able to migrate. National policymakers must take these divisions into account when

addressing migration in the context of environmental change. Longitudinal research is particularly helpful in understanding how these different reactions and forms of migration change over time with increasing environmental vulnerability. To what extent are those with greater resilience able to capitalize on their financial, social and/or human capital to incorporate migration into their adaptation strategies? Do less resilient households identify ways to use migration strategically in this regard, or are they more likely to be displaced when all other options are gone? In which circumstances do external resources leader to greater internal inequality? Under what circumstances do governments come to the decision to require or assist in planned relocation?

The impact of migration will also vary over time depending on a range of factors, including pre-existing vulnerability and resilience. Migration and its consequences can be viewed as a positive development, as a negative development, or simply as an event that will occur and should be addressed. As a positive strategy, migration can help the building of adaptive capacity through livelihood diversification, increasing household income, increasing information access, and consolidation of social networks across regions. Migration may also build awareness of environmental degradation for politicians, prompting them to take action. Adaptation strategies may also fail. Households abandon land, and individuals left behind may become more isolated. Individuals who migrate may arrive in unsafe urban zones or in resource-scare regions.

Adaptation strategies and the decision to migration depend heavily on how people perceive the threats to their livelihoods, and it can be difficult to know what the best choice is. The choice to move or stay may be affected by policies as well as household characteristics and experiences. The policies chosen by national governments to address migration are context-specific and depend upon whether the government intends to prevent migration or to leverage migration for adaptation. Governments may choose to help households build the adaptive capacity to stay by providing economic incentives or sharing knowledge about other options. Households must make decisions that will best serve their needs, but they often make these decisions with a lack of information about their options. If migration is going to happen no matter what and perhaps at a larger pace, there is need to prepare populations to leverage that movement. Some individuals and households may need and even wish to move out of harm's way, but they cannot because of poverty, disability or other sources of vulnerability. This may leave them trapped in situ, requiring planned relocation programs to avoid further harm and to guarantee long-term stability. However, the role of the diaspora in these decisions remains unclear.

Needless to say, relocation programs should reduce vulnerabilities rather than exacerbate them. Yet, the experience with involuntary resettlement programs initiated in the context of large-scale development projects, such as dams, has often led to negative outcomes for those who are resettled. They lose livelihoods, assets, social networks and become even more marginalized. Often people are resettled in areas that may actually be prone to other natural hazards, especially in coastal areas, and they risk being displaced again. National governments should take these vulnerabilities into account and design relocation policies in order to leverage adaptive capacity. Greater consultation with both those to be relocated and those in proposed destination areas would help reduce some of these negative impacts.

Planned relocation programs are not the only type of policies to support migration as adaptation tool. Others policies may encourage migration as well, such as reducing investments in infra-

structure, increasing regulation and taxation in the areas affected by weather shocks, and the requirement or withdrawal of insurance for those who choose to stay in areas affected by climate change. The government may also choose to leverage remittances or improve households' mobile skills. Governments may also choose to invest in urban development to encourage populations to move to urban areas by compensating the loss of subsistence farming and fishing income. These policies may transfer the cost of moving to the community rather than to the government, which makes migration even more difficult for the poorest populations. Poverty reduction must be one of the main goals of planned relocation schemes.

6. Evaluation Methodologies

Evaluation is extremely important for understanding the impacts of migrating or not migrating as well as the effects of government policies. Evaluation can inform a change in policy or the creation if policy in a different country. In order to capture long-term issues such as integration, resilience, and adaptive capacity, evaluation must be longitudinal in nature. Evaluation and measures of success will vary depending on households' decisions and government policies. Short-term political solutions, such as the building of seawalls or city walls to prevent flooding, as well as long-term processes of migration and adaptation are difficult to evaluate in terms of success. The key difficulty in evaluating these issues is determining what success means. Success could be measured by socio-economic status, level of household poverty, and vulnerability indices.

A topic of primary concern in longitudinal studies is how best to define and assess household migration and migration of individuals within households. The methods which yield the most reliable results differ according to the motivations for migration in addition to establishing households and the nature of the environmental change. Typical longitudinal survey design utilizes a baseline roster that establishes how a household is defined and who is included in each household. Panel rounds are used to ask the head of the household about household members' whereabouts, destinations, year of move, and motivation for moving. The definition of the household is extremely important, and it is important to use a broad enough definition to capture as much information as possible. Qualitative methods, such as in-depth interviews, can capture local knowledge and provide insights into the social and cultural mechanisms of migration, as well as the embeddedness of current migration into long-term migratory regimes and traditions.

Many tools are available for measuring migration, most notably surveys, panels, cross-sectional data, and proxy reporting. However, these may not always yield the most reliable information. Surveys often miss the poorest people, since they may not be registered; this is especially problematic for migrants in urban centers and informal settlements. Surveys also tend to miss temporary and seasonal movements. Proxy reports are subject to recall bias, and head of household responses are likely to be unreliable, especially since they are likely to report the first migration but not the last. Women are often reported to have moved for marriage but actually secure employment at their destination. It is difficult to track splits in households and to capture the full migration history. Ultimately, the migrant knows best when and why he or she moved.

Public surveys are not the most reliable research instrument, but there are few joint initiatives to discuss what should be included in a survey. The researcher's aim, whether to predict mass migration or to identify factors to prevent it, may affect subjects and skew the results.

It is a challenge to access vulnerable and hidden populations, such as undocumented migrants and people who are not sedentary. As mentioned above, poor people are often missed by surveys, but they are the most affected by weather shocks. Additionally, it is very difficult to gather data in a systematic and cohesive fashion in the aftermath of crises.

In order to address these weaknesses in data collection, researchers may adjust their research design. More systematic data collection is needed during all phases of movement, and there is a knowledge gap about the best indicators for the measurement of environmental change and migration. It may be useful to use drought and rainfall indices or similar databases that already exist. In order to capture vulnerable populations, it is necessary to gather more local data, which can be done through local mapping and a census on a community level. It is important to work with local hydrometeorological agencies to obtain historical and current datasets as well as examine published work on climate trends relating to these indicators in order to underscore the prospective type of longitudinal research which would be useful. Sustainable development programs, such as mitigating the environmental situation and improving long-term production, can be reached only through the integration of local knowledge.

One of the most significant challenges in data collection is how to capture the dynamism of movement, especially for circular migrants. Tracking phone sim cards may help determine movement, but it tracks only the card, not the person, so it is not a reliable way to track specific people. It may be helpful to use cross-sectional panels or to broaden the baseline index and to extend the length of panels but limit them to fewer sites in order to study migrants over the long term. Shorter term studies may be better served by studying more sites for fewer years.

Researchers' questions may significantly affect the data collected; perceptions play a serious role in households' migration decisions, but it can be difficult to create a questionnaire on perceptions without it leading the participants to a particular answer. This may not capture to what extent the impact of an event if mediated by other factors or explain the divergence from the researcher's understanding of the migrant's reasons and the migrant's perception of their own reasons. However, the social opinion and norms about migratory behavior can be captured through specific questions about the status of migration and migrants in the region.

The use of baseline data may be helpful in determining success in terms of economic position, public health status, and adaptive capacity. However, baseline data may be very difficult to gather, and the absence of a control group means it is challenging to determine when and how change occurred, and whether that change would have happened in the absence of intervention. Even with the use of baseline data, people may be better or worse because their adaptive capacity was better or worse initially. How do we get baseline data? It is important to look at people who have migrated as well as people. It may be possible in some cases to use those who do not migrate as a control group for those who do, but this does not control for all variables.

Success may be measured in different ways. A population that migrated may be compared to a population that did not, or a population may be compared to the general population. Using a counterfactual or a population that can be considered similar enough to act as a control group, a population that migrated can be compared to a population that did not. Whether or not the re-

searcher uses a counterfactual or comparison group, it may be possible to examine whether migration or other strategies result in the accumulation of assets, on the assumption that this will increase resilience, or if the strategies depleted assets and only guaranteed survival rather than reducing vulnerability.

Once the measurement of success has been determined, it is possible to use human development and economic information to measure the quality of life for the population in question. However, measuring concepts such as adaptation and integration can be more difficult. It may be possible to measure migrants' interaction with institutions through their voting records and registration for government services, but assessing the extent to which communities are engaged can be challenging. Using surveys and asking about communities' involvement and analyzing the design of communities and structural and spatial integration can be helpful.

After determining what qualifies as success, it is necessary to decide over what period of time success or failure should be measured. Some indicators may take longer to measure than others, especially when studying how migrants relate to their communities. "Snapshots" after a short period of time will not adequately measure these processes, but policymakers need deliverables that are timely enough to affect policy. Evaluation should happen in cycles, each of which should inform policy change. Evaluation could happen after one year, three years, and twenty years, with the hope of addressing issues after each evaluation.

Evaluation and longitudinal research will be especially important for the National Adaptation Planning process, for which assessments of migration and mobility could be useful. Surveys and evaluation of the flows relevant to each country will be important tools, but data from neighboring or similar countries may also help inform national and regional policies regarding mitigation and adaptation. [more about National Adaptation Planning] Longitudinal research and evaluation could play a major role in the National Adaptation Planning process if policymakers and donors understand the importance of longitudinal data in policy creation and implementation.

In order for longitudinal research and longitudinal evaluation to happen, donors need to be convinced that they are useful tools and are worth the expense. While the benefits of longitudinal research and evaluation have already been discussed in this paper, policymakers and donors may require more concrete tools to put longitudinal research into action. [what tools donors need to consider fostering these longitudinal methods]

Evaluation provides best practices, cost analyses, and recommendations for efficient programs for policymakers. These evaluations can be used to evaluate the effects of a particular program but also to inform the creation of policy in other countries and crises.

7. Conclusions and Next Steps

Workshop participants identified important next steps in order to advance longitudinal research and evaluation of migration in the context of environmental change. They recommended holding meetings with governments affected by environmental change as well as donors in order to con-

vey the importance of instituting longitudinal research designs now in order to capture the determinants and impacts of migration as well as the effectiveness of different adaptation policies. Participants also recommended creating standards of terminology and measurement in the field. Stocktaking of existing programs and exploration of existing survey and statistical technology, often from other fields of study, were also identified as being important next steps. Following these priorities, it is important to create a toolkit for government and civil society for identifying ways in which migration can be used as an effective adaptation strategy, to clarify and standardize conceptual issues, and to explore links between migration as adaptation and urbanization. Per Kanta: which governments should be targeted for these meetings? When would this happen? What is the modality? Per Andrea: we need more concrete steps.

Annex 1 – List of Participants

**Longitudinal Research on Environmental Change and Migration
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MC C2-125**

LIST OF PARTICIPANTS

Julia Blocher
Julia Blocher is a PhD Candidate at the Institute for Human and Social Sciences at the University of Liège (CEDEM) and a Research Assistant for the recently launched "Politics of the Earth" program at the Paris Institute of Political Studies (Sciences Po). Her research deals with the relationship between environment and climate change and human mobility in East Africa, with an emphasis on the role of socio-political factors. Blocher is currently part of two main European-Union-supported research projects, as a researcher for the 'High-End Climate Impacts and eXtremes' (HELIX) consortium and as a Research Advisor for the 'Migration, Environment and Climate Change: Evidence for Policy (MECLEP)' project led by the International Organization for Migration (IOM). Blocher has previously led a career with the Internal Displacement Monitoring Centre (IDMC) and the United Nations Refugee Agency (UNHCR). She has contributed to a number of publications on environmentally-induced migration and displacement and holds a master's degree in International Affairs: Environment, Sustainable Development and Risks from Sciences Po Paris.

Supriyo De
Supriyo De is on leave from the Ministry of Finance, India for a research assignment with the World Bank's Migration and Remittances team at the Development Economics Prospect Group. Prior to this he was Officer on Special Duty to the Chief Economic Adviser of India. He worked in policy and operational roles since 1995. He has a Ph.D. in Economics from the University of Sydney and was a recipient of the Endeavour International Postgraduate Research Scholarship. He also completed his Master of Economics from Yokohama National University as a part of the Joint-Japan World Bank Scholarship Program. His research interests include analysis of sovereign credit ratings, macroeconomic impacts of remittances, fiscal policy in developing countries, endogenous growth theory, technology policy and intangible capital.

Seifu Hagos
Seifu Hagos is a lecturer in the School of Public Health at Addis Ababa University and is a candidate for a PhD. His research focuses on food security, climate variability and spatial patterns in Ethiopia. The aim of this study includes developing a statistical model to quantify the impact of climate change on food security and its components, and further analyses the spatial pattern in Ethiopia. Moreover the study aims to validate household food insecurity assessment tool (HFIAS) developed for international use. He obtained his BSc in Public Health from Alemaya University in 1994.

Felicitas Hillmann
PD. Dr. Felicitas Hillmann is head of the migration unit of the research project "New regional formations: environmental change and migration in coastal areas in Ghana and Indonesia", funded by the Volkswagen-foundation and is based at the Free University in Berlin., Institute for Geography. Her academic career includes positions at the WZB (Social Science Research Center) in Berlin (1995 – 2000), at the WSI (Wirtschafts- und Sozialwissenschaftliches Institut) in Düsseldorf (2001), at the Free University of Berlin (2001 – 2006) and a professorship for Urban Geography at Bremen University (2006 – 2012), a guest-professorship at the FU Berlin(2012/13) and a professorship in Cologne (2013/2014). Her research interests have been focusing for many years on the field of migration studies, especially on international migration and transformation & development. A special focus of her work is on the labor market integration, especially on the dynamics of migrant entrepreneurship. She also works on the emergence of new regional formations and the emblematic role of port cities for changing patterns of mobilities.

Lara Kinne
Lara Kinne is a Research Specialist with the Office of the Senior Vice President for Research and the Institute for the Study of International Migration (ISIM) at Georgetown University. She received a Master of Arts in Latin American Studies from the School of Foreign Service, along with a Certificate of Refugees and Humanitarian Emergencies from ISIM at Georgetown in 2011. Her undergraduate work at Boston College was in Political Science and Latin American Studies. Lara's current research focuses on complex humanitarian crises in the Horn of Africa, unaccompanied minors in the Mexican- US corridor, and human trafficking in Central America and Mexico.

Dominic Kniveton
Dominic Kniveton is Professor of Climate Change and Society at the University of Sussex. Originally focusing on the science and modelling of climate change his work encompasses studies of impact, vulnerability, adaptation, and climate resilience. In particular his recent research has explored the nexus of environmental change and migration and the development of novel methodologies including combining agent based modelling with Q methodology to explore the intersection of the natural and social sciences. Recognition of his profile in this field is shown by invited participations in expert group meetings run by various agencies of the United Nations, UK government and International Organisation of Migration. Dominic's other major research interest include humanitarian actions where he has been working to develop tools to enhance the use of climate information within decision-making with particular regard to the global south. Dominic is also currently a visiting scientist at the International Centre for Integrated Mountain Development (ICIMOD).

Andrea Liverani
Andrea is currently a Program Leader with the WB Maghreb Department (MNC01) working on social, urban and environment operations. During his time with the WDR 2010 on Development and Climate Change, he set up a research program on climate change and migration in the Middle East and North Africa region, which led to the recent WB publication on 'Climate change and migration, evidence from MENA', of which he's a co-author. Prior to joining the Bank he held positions within the OECD Development Assistance Committee, Government, and academia. Andrea holds a MSc and a PhD from LSE.

Susan Martin
Susan Martin holds the Donald G. Herzberg Chair in International Migration and serves as the Director of the Institute for the Study of International Migration in the School of Foreign Service at Georgetown University. She also serves as the Chair of the Thematic Working Group on Environmental Change and Migration for the KNOMAD project at the World Bank. Previously Dr. Martin served as the Executive Director of the U.S. Commission on Immigration Reform, established by legislation to advise Congress and the President on U.S. immigration and refugee policy. Her most recent book publications include *International Migration: Evolving Trends from the Early Twentieth Century to the Present* and *Migration and Humanitarian Crises: Causes, Consequences and Responses*. Dr. Martin received her MA and PhD in the History of American Civilization from the University of Pennsylvania.

Briana Mawby
Briana Mawby serves as a research consultant for KNOMAD TWG 11. She is a candidate for a Master of Arts in conflict resolution at Georgetown University. Her focus is on post-conflict reconstruction and peacebuilding in East and Central Africa, and she will graduate with a Certificate of Refugees and Humanitarian Emergencies from the Institute for the Study of International Migration at Georgetown in May 2015. She earned her undergraduate degree in international affairs at George Washington University, with a focus on conflict and security. She has previously worked at United Way, the Office of Foreign Assistance Resources in the Department of State, and as a research assistant to Susan Martin.

Valerie Mueller
Valerie Mueller is a Senior Research Fellow in the Development Strategy and Governance Division at the International Food Policy Research Institute. She previously worked as a Post-doctoral Research Fellow in the Earth Institute at Columbia University. Prior to the fellowship, she obtained her PhD in Agricultural and Resource Economics from the University of Maryland, 22 College Park. A large body of her work focuses on the role of migration and occupational diversification to mitigate risk in developing countries (Bangladesh, Brazil, Ethiopia, Nigeria, Pakistan). Her recent research has been featured in Nature Climate Change, The Proceedings of the National Academy of Sciences, and World Development.

Sonia Plaza
Sonia Plaza is a Senior Economist at the World Bank, in its Macroeconomics and Fiscal Management Global Practice. She works in the Global Knowledge Partnership on Migration and Development (KNOMAD). She is the co-chair of the "thematic working group on diaspora" of the KNOMAD initiative. Her expertise includes migration, remittances, and trade policies. Sonia attended the University of Lima and earned a degree in Economics. She also has a dual degree from Yale University and the University of Pennsylvania in International Economics and Development. She is a research fellow of the IZA-Institute for the Study of Labor.

Dilip Ratha
Dilip Ratha is Manager, Migration and Remittances Unit and Head, Global Knowledge Partnership on Migration and Development (KNOMAD) in the Development Prospects Group of the World Bank. He is the focal point for the World Bank's Migration Working Group and the Diaspora Bond Task Force, and a co-coordinator of the (G8) Global Remittances Working Group. According to the New York Times, "No one has done more than Mr. Ratha to make migration

and its potential rewards a top-of-the-agenda concern in the world's development ministries." Besides migration and remittances, Dilip's research reflects a deep interest in innovative financing for poor countries: diaspora bonds, future-flow securitization, shadow sovereign ratings and South-South foreign direct investment. He is currently the chair of the Consortium Advisory Group (and previously the founding CEO) of the Migrating out of Poverty Research Consortium based in the University of Sussex. Prior to joining the World Bank, he worked as a regional economist for Asia at Credit Agricole Indosuez, Singapore; as an assistant professor of economics at the Indian Institute of Management, Ahmedabad; and as an economist at the Policy Group, New Delhi. He has a Ph.D. in economics from the Indian Statistical Institute, New Delhi where he also worked as a visiting lecturer and helped build a CGE model of the Indian economy. Dilip hosts People Move, a popular blog and can be followed on Twitter at @DilipRatha. His TED Talk "The hidden force in global economics: sending money home" has been viewed over a million times.

Kanta Kumari Rigaud
Kanta Kumari Rigaud is a lead environmental specialist at the World Bank and has more than 25 years of professional experience in natural resources management, environment management, and climate change adaptation in multinational, national, academic, and non-governmental organizations. Ms. Rigaud is the Bank's focal point for the Pilot Program for Climate Resilience, one of the programs of the Climate Investment Funds (CIF). Her responsibilities include portfolio management, reporting, and budget management. She works with the regional teams and the CIF administrative unit to foster shared learning and knowledge exchange through communities of practice to advance the climate resilience agenda. Ms. Rigaud holds a Ph. D. from the University of East Anglia and was the recipient of the British Chevening Scholarship and the World Bank Graduate Scholarship award for her doctoral dissertation. She was also a senior research associate at the Centre for Social and Economic Research on the Global Environment at the University of East Anglia. Prior to her Ph. D., she worked with the World Wildlife Fund in Malaysia for several years leading the development of conservation strategies for provincial states in Malaysia and supporting policy-oriented research and dialogue with government and other key stakeholders. She has a master's degree in behavioral ecology from the University of Stirling, UK; a bachelor's degree in ecology; and a diploma in education from the University of Malaya. She has more than 35 publications, including articles in peer-reviewed journals and technical reports on natural resources and environmental and climate issues.

Benjamin Schraven
In his current position as a Senior Researcher in the department Environmental Policy and Natural Resources Management of the German Development Institute Benjamin Schraven's work focuses mainly on the interrelation between environmental change and migration, rural and urban livelihoods as well as local adaptation strategies to processes of climate change and environmental degradation. He holds a PhD in Development Research from the Center for Development Research of the University of Bonn, Germany, where he also worked as a Senior Researcher until 2011. Prior to his PhD studies, he received a Master degree in Political Science, Sociology and History from the University of Bonn. He is also frequently giving lectures in household survey methodology and quantitative data analysis (e.g. for the German Academic Exchange Service). Furthermore, Benjamin Schraven has cooperated with UNICEF, ILO and other (international) development agencies on migration and livelihood issues.

Kirsten Schuettler
Kirsten Schuettler is a Senior Program Officer at the World Bank's Development Economics – Prospects Group. In the Migration & Remittances team her responsibilities include monitoring remittances flows to the MENA region and contributing to the implementation of the Global Knowledge Partnership on Migration and Development (KNOMAD). Prior to joining the World Bank, she worked for the Deutsche Gesellschaft für Zusammenarbeit (GIZ) as a component manager in the Innovation and Entrepreneurship Promotion Program in Tunisia and as an advisor on migration and private sector development at GIZ headquarters. She has worked and published on different aspects of the link between migration and economic development.

Cecilia Tacoli
Dr Cecilia Tacoli is a Principal Researcher at the Institute for Environment and Development, where she currently heads the Human Settlements Group. Her work explores how the relations between rural and urban areas, people and enterprises are transformed by urbanization processes. She has written and edited several publications on this topic, including The Earthscan Reader in Rural-Urban Linkages and several special issues of the journal Environment and Urbanization, and has researched the links between migration, environmental change and urbanisation with partners in Africa, Asia and Latin America and served as a contributing author on the IPCC 5th Assessment Report.

Abbie Taylor
Abbie Taylor holds a Master of Arts in Arabic and International Relations from the University of Saint Andrews, Scotland, and a Master of Arts in Arab Studies from Georgetown University. Prior to joining ISIM, Abbie lived in Syria, studying Arabic and working for local NGOs in the related fields of education and development. Abbie has also worked as a consultant for the Displacement Monitoring Program of the International Organization for Migration's Iraq Mission in Amman, Jordan. In her native Scotland, she has provided support to female refugees and asylum-seekers as part of the British Red Cross Refugee Orientation Services.

Roy van der Weide
Roy van der Weide is an Economist on the Poverty and Inequality Research team within the Development Research Group of the World Bank. He recently assumed the responsibility of leading the poverty and inequality mapping research within the department. His other research is concerned with the empirics of inequality of opportunity and poverty reduction, axiomatic approaches to income measurement, spatial econometrics, and the transmission of price inflation and volatility. His publications cover a wide array of topics, which include the small area estimation of poverty and inequality, index number theory, multi-variate volatility modeling, and behavioral economics. He holds a PhD from the University of Amsterdam where his research focused on time-series econometrics and economic dynamics with applications to finance. Over time, research on poverty and inequality came to dominate his work agenda.

Marco Venier
Marco Venier is a Research Consultant at the World Bank Global Knowledge Partnership on Migration and Development (KNOMAD), Thematic Working Group for Environmental Change and Migration. Working for the Sahel Programme of the United Nations Office on Drugs and Crime (UNODC) in Dakar, Senegal, his areas of expertise are security, development and migration in the West and Central Africa region, on which he focused his MSc. Dissertation at the

London School of Economics and Political Science (LSE). Fluent in four languages, he has previous experience with the International Fund for Agricultural Development (IFAD) in Rome, and has attended McGill University (Montreal, Canada), where he obtained a B.A. in Political Science with Honours, focusing on international relations, development, and climate change.

Koko Warner
Dr. Koko Warner is the Head of the Environmental Migration, Social Vulnerability and Adaptation Section at UNU-EHS. Warner is a Lead Author for IPCC´s 5th Assessment Report, Working Group 2 on Adaptation (chapter 20). Warner researches risk management strategies of the poor in adapting to changing environmental and climatic conditions. She directs three research tracks at UNU related to adaptation: the use of risk management and risk transfer measures, social resilience and environmental change, and environmentally induced migration. Warner served on the management board of the EACH-FOR project, a first-time global survey of environmentally induced migration in 23 countries. She was Co-Chair of the German Marshall Fund project on Climate Change and Migration. She helped found and is on the Steering Committee of the Climate Change, Environment, and Migration Alliance (CCEMA) and works extensively in the context of the UNFCCC climate negotiations on adaptation (particularly in risk management and migration). Koko Warner studied development and environmental economics at George Washington University, and the University of Vienna where she received her PhD in economics as Fulbright Scholar.

Hanspeter Wyss
Hanspeter Wyss is a Senior Program Officer at the World Bank's Development Economics - Prospects Group. In the Migration & Remittances team his responsibilities include the contribution to the implementation of the Global Knowledge Partnership on Migration and Development (KNOMAD), primarily in the areas of environmental change and migration, migrant rights and integration in host communities. Prior to joining the World Bank, he worked at the Swiss Agency for Development and Cooperation (SDC), which is part of Switzerland's Ministry of Foreign Affairs. He was SDC's focal point for both the Multilateral Network and for Management for Development Results (2008-13), program manager for multilateral negotiations in sustainable development & environment (2005-2008), as well as deputy head of the Swiss Cooperation Office in Benin (2002-2005). He holds a master degree in development economics (University of Zurich).

Nili Yossinger
Nili Sarit Yossinger is a Research Specialist with the Office of The Senior Vice President for Research and the Institute for the Study of International Migration (ISIM) at Georgetown University. She holds a Bachelor of Arts in International Studies from Loyola University Chicago and a Master of German and European Studies from theSchool of Foreign Service, along with a Certificate in Refugees and Humanitarian Emergencies from ISIM. She previously worked with the United Nations Refugee Agency, Human Rights First, and the Capital Area Food Bank of Washington DC. Nili's current research focuses on complex humanitarian emergencies, with an emphasis on food security, environmental degradation, and forced migration in the Horn of Africa and Persian Gulf regions.

Caroline Zickgraf

Caroline Zickgraf is the Holder of the Joint Chair on Environmental Risks at the University of Liège and the University of Reims Champagne-Ardenne and Research Fellow at the Center for Ethnic and Migration Studies (CEDEM-ULg). Additionally, she teaches the course 'Environment and Migration' at Sciences Po Paris. Her research primarily investigates the relationship between environmental changes and human (im)mobility, with geographic foci in West Africa and South Asia. Since 2013, Dr. Zickgraf has worked on the EU-funded FP7 project "High End cLimate Impacts and eXtremes (HELIX)", a consortium led by the University of Exeter. In this framework, she explores the impact of migration on the capacity of immobile populations in Senegal and Bangladesh to adapt to climate change.   She has authored and contributed to several publications on migration and the environment, transnationalism, and the impacts of migration on family life. Dr. Zickgraf is the lead author of the forthcoming KNOMAD paper, "The Impact of Vulnerability and Resilience to Environmental Changes on Mobility Patterns in West Africa". She holds degrees from Michigan State University (BA), Leiden University (MPhil), and the University of Liège (PhD).

Annex 2 – Workshop Agenda

Longitudinal Research on Environmental Change and Migration
A Workshop on Objectives, Methods and Applicability to Policy and Practice
AGENDA

Thursday, March 19, 2015

9:00   Welcome and Introductions
                Dilip Ratha, Head – Global Knowledge Partnership on Migration and Development (KNOMAD)
                Susan Martin, Chair, KNOMAD Thematic Working Group "Environmental Change and Migration"

                Tour de Table: What are the most important issues to address regarding longitudinal research on environmental change and migration?

10:15   Break

10:30   Longitudinal Research on the Environmental Determinants of Migration
                Moderator: Susan Martin

                This session will focus on research designs that would enable scholars, policymakers and practitioners to understand more clearly the various ways in which environmental changes, on their own or in combination with other factors, affect mobility of persons. All forms of mobility will be considered: anticipatory migration, displacement and planned relocation. The session will review the findings and implications of current longitudinal studies as well as future research needs.

                Lead Off Speakers:
                Valerie Mueller, International Food Policy Research Institute
                Dominic Kniveton, University of Sussex

12:30   Public Session on Resilience and Vulnerability as a Determinant and Impact of Environmentally Driven Mobility
                Location: MC 6-100
                Moderator: Dilip Ratha
                Speakers: Dominic Kniveton, University of Sussex
                                 Caroline Zickgraf, University of Liège
                                 Marco Venier, UNODC

14:00   Longitudinal Research on the Impacts of Environmentally Induced Migration
                Moderator: Susan Martin

                This session will focus on research designs that would enable scholars, policymakers and practitioners to understand more clearly the impact of various forms

of human mobility in the context of environmental change. As above, the session will consider the impacts of anticipatory migration, displacement and planned relocation, and it will review current studies as well as future research needs.

Lead Off Speakers:
Benjamin Schraven, German Development Institute
Cecilia Tacoli, International Institute for Environment and Development

15:30   Break

15:45   Break Out Groups
          (One group on environmental determinants/other on impacts)

16:45   Reports on Break out Groups

17:00   Adjourn

19:00   Dinner at Restaurant Primi Piatti, 2013 I Street NW, Washington DC

Friday, March 20, 2015

9:00   Longitudinal Evaluations of Migration-Related Adaptation Programs
          Moderator: Kanta Kumari, World Bank

          This session will focus on research designs that would enable scholars, policy-makers and practitioners to understand more clearly the implementation and impact of adaptation programs that affect mobility patterns. These adaptation programs may seek to address the determinants of migration to enable people to remain in situ, or they may involve migration as an adaptation strategy. It will focus, in particular, on longitudinal evaluation of planned relocation programs.

          Lead Off Speakers:
          Andrea Liverani, World Bank
          Julia Blocher, University of Liège

10:15   Break

10:30   Break Out Groups
          (One group on adaptation to reduce emigration pressures/one on migration as form of adaptation)

11:30   Reports on Break Out Groups

12:15   Recommendations
          Moderator: Susan Martin
          Tour de table